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, 2025

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 001-39782

4D Molecular Therapeutics, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**47-3506994**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
5858 Horton Street #455 Emeryville, CA	**94608**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (510) 505-2680

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, par value $0.0001 per share	FDMT	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 Section 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. YES ☒ NO ☐

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

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

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

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

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

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

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

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

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the registrant, based on the closing price of the shares of common stock on The Nasdaq Global Select Market on June 30, 2025 was $166,461,070.

The number of shares of registrant's Common Stock outstanding as of March 16, 2026 was 51,051,487. This number does not include 16,935,665 shares of common stock issuable upon the exercise of pre-funded warrants outstanding as of March 16, 2026 (which are immediately exercisable at an exercise price of $0.0001 per share of common stock, subject to beneficial ownership limitations).

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive Proxy Statement relating to the 2026 Annual Meeting of Stockholders are incorporated herein by reference in Parts II and III of this Annual Report on Form 10-K to the extent stated herein. The proxy statement will be filed with the Securities and Exchange Commission within 120 days of the registrant's fiscal year ended December 31, 2025.

Table of Contents

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These forward-looking statements concern our business, operations and financial performance and condition, as well as our plans, objectives and expectations for our business operations and financial performance and condition. Any statements contained herein that are not statements of historical facts may be deemed to be forward-looking statements. In some cases, you can identify forward-looking statements by terminology such as "aim," "anticipate," "assume," "believe," "contemplate," "continue," "could," "due," "estimate," "expect," "goal," "intend," "may," "objective," "plan," "predict," "potential," "positioned," "seek," "should," "target," "will," "would" and other similar expressions that are predictions of or indicate future events and future trends, or the negative of these terms or other comparable terminology. These forward-looking statements include, but are not limited to, statements about:

- the success, cost and timing of our development activities, preclinical studies and clinical trials, including our clinical trials for 4D-150, 4D-175, 4D-710 and 4D-725;
- the number, size and design of our planned clinical trials, and what regulatory authorities may require to obtain marketing approval;
- the timing of Investigational New Drug Application ("IND") enabling studies and results from such studies;
- the timing and success of lead optimization for our product candidates in lead optimization;
- the translation of our preclinical results and data into future clinical trials in humans;
- the timing of any manufacturing runs for materials to be used in patient trials;
- the timing or likelihood of regulatory filings and approvals;
- our ability to obtain and maintain regulatory approval of our product candidates, and any related restrictions, limitations and/or warnings in the label of any approved product candidate;
- our ability to obtain funding for our operations, including funding necessary to develop and commercialize our product candidates;
- the rate and degree of market acceptance of our product candidates, if approved;
- the success of competing products or platform technologies that are or may become available;
- our plans and ability to establish sales, marketing and distribution infrastructure to commercialize any product candidates for which we obtain approval;
- future agreements with third parties in connection with the commercialization of our product candidates;
- the size and growth potential of the markets for our product candidates, if approved for commercial use, and our ability to serve those markets;
- existing regulations and regulatory developments in the United States and foreign countries;
- the expected potential benefits of strategic collaboration agreements, including our relationships with Otsuka Pharmaceutical Co., Ltd. and Cystic Fibrosis Foundation, and our ability to attract collaborators with development, regulatory and commercialization expertise;
- the scope of protection we are able to establish and maintain for intellectual property rights covering our product candidates and technology;
- potential claims relating to our intellectual property and third-party intellectual property;

- our ability to contract with third-party suppliers and manufacturers and their ability to perform adequately;
- the pricing and reimbursement of our product candidates, if approved;
- the potential effects of public health emergencies to our preclinical and clinical programs and our business;
- our ability to attract and retain key managerial, scientific and medical personnel;
- the accuracy of our estimates regarding expenses, capital requirements and needs for additional financing; and
- our financial performance.

These forward-looking statements are based on management's current expectations, estimates, forecasts and projections about our business and the industry in which we operate and management's beliefs and assumptions and are not guarantees of future performance or development and involve known and unknown risks, uncertainties and other factors that are in some cases beyond our control. As a result, any or all of our forward-looking statements in this Annual Report on Form 10-K may turn out to be inaccurate. Factors that may cause actual results to differ materially from current expectations include, among other things, those listed under the section titled "Risk Factors" and elsewhere in this Annual Report on Form 10-K. Potential investors are urged to consider these factors carefully in evaluating the forward-looking statements. These forward-looking statements speak only as of the date of this Annual Report on Form 10-K. Except as required by law, we assume no obligation to update or revise these forward-looking statements for any reason, even if new information becomes available in the future. You should, however, review the factors and risks we describe in the reports we will file from time to time with the SEC after the date of this Annual Report on Form 10-K.

SUMMARY RISK FACTORS

Our ability to implement our business strategy is subject to numerous risks that you should be aware of before making an investment decision. The following is a summary of the principal risks that could seriously harm our business, all of which are more fully described in Part I. Item 1A. "Risk Factors" in this Annual Report on Form 10-K. This summary should be read in conjunction with the other risk factors included in the "Risk Factors" section and should not be relied upon as an exhaustive summary of the material risks facing our business.

- We are in the late stages of drug development for our lead program and have a limited operating history and no products approved for commercial sale, which may make it difficult to evaluate our current business and predict our future success and viability.
- We have had recurring net losses, and we expect to continue to incur significant net losses for the foreseeable future.
- We will require substantial additional capital to finance our operations. If we are unable to raise such capital when needed, or on acceptable terms, we may be forced to delay, reduce and/or eliminate one or more of our research and drug development programs or future commercialization efforts.
- All of our product candidates are based on a novel AAV genetic medicine technology with which there is limited regulatory and clinical experience to date, which makes it difficult to predict the time and cost of product candidate development and subsequently obtaining regulatory approval. Further, the regulatory approval process for novel product candidates such as ours can be more expensive and take longer than for other, better known or extensively studied therapeutic modalities.

- Adverse public perception or regulatory scrutiny of genetic medicine technology may negatively impact the developmental progress or commercial success of products that we develop alone or with collaborators.
- Our clinical trials may fail to demonstrate substantial evidence of the safety and efficacy of our product candidates, which would prevent, delay or limit the scope of regulatory approval and commercialization, which could seriously harm our business.
- Gene therapies are novel, complex and difficult to manufacture. We could experience production problems that result in delays in our development or commercialization programs, limit the supply of our products or otherwise seriously harm our business.
- The regulatory approval processes of the FDA, European Medicines Agency ("EMA") and comparable foreign regulatory authorities are lengthy, expensive, time consuming, and inherently unpredictable. If we are ultimately unable to obtain regulatory approval for our product candidates, we will be unable to generate product revenue and our business will be substantially harmed.
- Our success depends on our ability to protect our intellectual property and our proprietary technologies.
- Our rights to develop and commercialize our product candidates are subject in part to the terms and conditions of licenses granted to us by others, and the patent protection, prosecution and enforcement for some of our product candidates may be dependent on our licensors.
- Our employees, independent contractors, consultants, research or commercial partners or collaborators and vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

PART I

Item 1. Business.

Overview

We are a leading late-stage biotechnology company advancing durable and disease-targeted therapeutics with the potential to transform treatment paradigms and provide unprecedented benefits to patients. Our products are developed with customized and evolved adeno-associated virus (“AAV”) vectors invented from our proprietary vector discovery platform, Therapeutic Vector Evolution (“TVE”) which was designed to generate vectors with properties that overcome the limitations of conventional AAV vectors. TVE applies the principles of directed evolution in non-human primate (“NHP”) models to select vectors that target tissues of diseases with high unmet need using routine and local routes of administration. We are focused on clinical-stage product candidates in retina and lung utilizing vectors invented with TVE and believe the clinical results to date validate the platform.

Our lead product candidate 4D-150 utilizes our proprietary R100 vector and a transgene encoding anti-VEGF biologics (inhibitors of vascular endothelial growth factor): aflibercept (targeting VEGF-A, VEGF-B and placental growth factor) and an RNA interference (RNAi) approach targeting VEGF-C. The goal for our development and potential commercialization of 4D-150 is to transform the standard of care for large market retinal vascular diseases with a safe, in-office, and durable lifelong backbone therapy, substantially reducing treatment burden and improving long-term vision outcomes. 4D-150 is initially being developed for the treatment of wet age-related macular degeneration (“wet AMD”) and diabetic macular edema (“DME”).

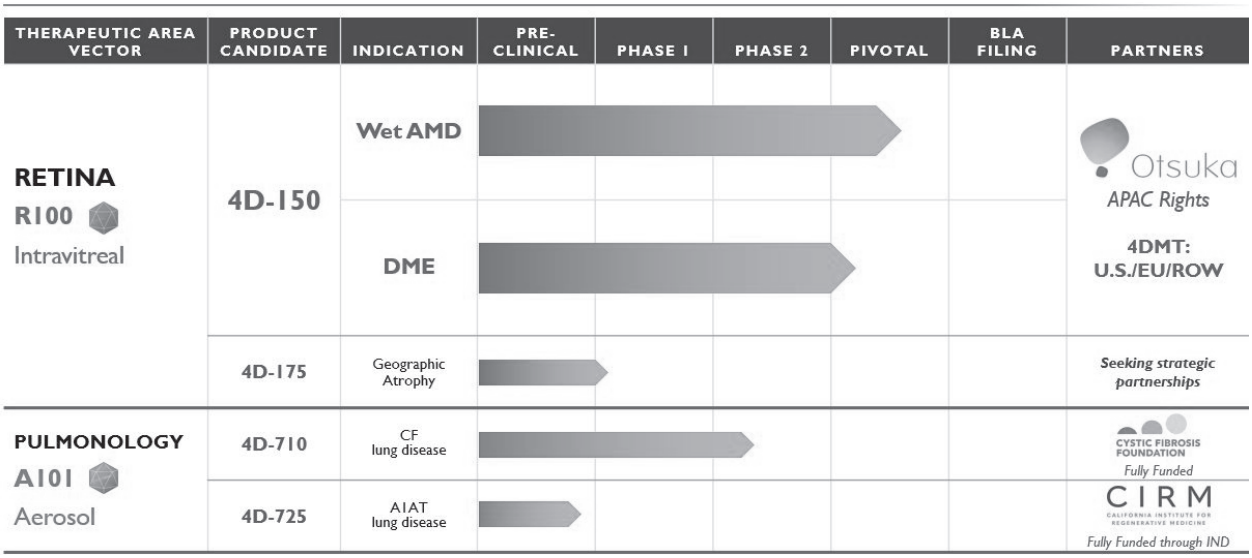
Our other pipeline programs include 4D-710, which we believe is the first known genetic medicine to demonstrate successful delivery and durable expression of the cystic fibrosis transmembrane conductance regulator (“CFTR”) transgene in the lungs of people with cystic fibrosis ("CF") and is currently in Phase 2 development. We believe these results will translate into durable clinical improvements in people with CF, including improved lung function and quality of life.

We believe we are well positioned to discover, develop, manufacture and if approved, commercialize targeted genetic medicines with the potential to transform the lives of patients suffering from debilitating diseases.

Our Product Candidate Pipeline & Strategy

We have developed a pipeline of product candidates in two therapeutic areas, retina and pulmonology, focusing on disease areas of high unmet need and commercial potential. Our strategy focuses on advancing our lead product candidate 4D-150 through Phase 3 trials in wet AMD and DME and if successful, commercialization, while advancing our early-stage programs in retina and pulmonology through clinical proof-of-concept. We believe these product candidates are differentiated and can not only provide meaningful benefit to patients, but also are suitable for scalable, global adoption by physicians and payors.

Below is a summary of our product candidate pipeline:



Retina Therapeutic Area

Introduction

We are developing product candidates to treat severe retinal diseases with our customized and evolved vector, R100. R100 was developed for in-office intravitreal injection to deliver transgene payloads to all major cell layers of the retina, with potentially lifelong transgene expression. We believe leveraging the same novel vector in multiple product candidates will increase product development efficiencies, decrease development risks and inform the clinical development of subsequent product candidates using the same vector. We believe our product candidates targeting large-market retina diseases such as wet AMD and DME have the potential to reshape the standard of care, resulting in substantial benefit for patients.

Our lead retina product candidate 4D-150 is currently in Phase 3 development for wet AMD and is preparing to enter Phase 3 development in DME.

Our second retina product candidate is 4D-175 for geographic atrophy and has an open IND. Further development for 4D-175 is currently pending financing, including potential strategic partnerships.

4D-150 for Wet AMD and DME

Disease Background, Unmet Medical Need, and Target Patient Population

Wet AMD is a highly prevalent disease with an estimated 5 million patients affected in the United States, major European markets, and Japan, and is expected to continue growing with the aging global population. Wet AMD is a type of macular degeneration where abnormal blood vessels (choroidal neovascularization or "CNV") grow into the macula, the central area of the retina. CNV causes swelling and edema of the retina, bleeding and scarring, which can result in visual distortion and reduced acuity. The proliferation and leakage of abnormal blood vessels is stimulated by protein members of the VEGF family, such as VEGF-A, -B, -C, and placental growth factor (“PIGF”). This process distorts and can potentially destroy central vision and may progress to blindness without treatment.

Diabetic eye disease (diabetic retinopathy, including DME) is the leading cause of vision loss and blindness in working-age adults in developed countries. Diabetic retinopathy is a complication of diabetes that arises from chronic hyperglycemia–induced damage to retinal blood vessels, leading to increased vascular permeability and angiogenic signaling. Specifically, DME affects an estimated 4 million patients in the United States, major European markets, and Japan, and is expected to grow with the rapidly increasing prevalence of diabetes. DME is a vision-threatening complication of diabetic retinopathy characterized by macular fluid accumulation. The development of DME is driven by upregulation of VEGF and inflammatory mediators that promote vascular leakage and macular edema, ultimately leading to vision loss.

The current treatment paradigm for both wet AMD and DME requires frequent intravitreal bolus injections of patients with anti-VEGF biologics that inhibit blood vessel leakage and proliferation of new blood vessels, reducing edema and bleeding risk, and allowing in many instances some visual acuity to be recovered. Each anti-VEGF injection requires an in-office visit, which carries significant burden and discomfort to patients, and when patients miss injections, they may experience vision decline due to undertreatment. Based on real world data for wet AMD, approximately 40% of patients discontinue treatment by year one, and early vision gains are followed by steady long-term vision decline, which is associated with declining injection frequency. Even with frequent treatment, the disease can often be under poor control, with higher variability in retina anatomy associated with vision loss. Bolus anti-VEGF treatment of retinal vascular diseases represents global branded therapeutic markets of over $16 billion, with wet AMD and DME comprising approximately $14 billion.

We believe these major chronic retinal vascular diseases are ideal applications for genetic medicines. Multiple products on the market validate the efficacy of the anti-VEGF biologics therapeutic approach. A single dose genetic medicine delivering potentially lifelong expression of anti-VEGF biologics as a backbone therapy delivered with a routine in-office intravitreal injection could transform the standard of care for these diseases. In addition, we expect the relatively low doses required to allow for favorable manufacturing scalability, cost of goods sold, and pricing flexibility compared to conventional IV genetic medicines.

Our Solution

4D-150 is a genetic medicine designed to be a backbone therapy for chronic retinal vascular diseases.

The product candidate combines our proprietary R100 vector designed for efficient intravitreal delivery to the retina with a dual transgene payload expressing aflibercept and VEGF-C RNAi. Sustained expression of 4D-150 transgenes has the potential to reduce the treatment burden of repeated visits for anti-VEGF injections required to maintain optimal visual outcomes. Intravitreal delivery of biologics into the eye is a routine in-office injection, which we believe allows for seamless adoption into retina clinic workflows.

Differentiation of 4D-150

AAV genetic medicine approaches are being developed by several companies to treat wet AMD by delivering a copy of a transgene encoding an anti-VEGF biologic by either subretinal surgery or suprachoroidal injection with a conventional AAV vector, or intravitreal administration with a mouse-evolved vector. It remains to be demonstrated whether conventional AAVs or mouse-evolved vectors can deliver significant retinal coverage while limiting toxicities. In comparison, our customized and evolved vectors are invented and tested in primates whose eyes more closely resemble the anatomy of the human eye than of mouse eyes. Compared to subretinal or suprachoroidal delivery, we believe that our R100 vector-based products provide comprehensive retinal coverage via an intravitreal injection, while delivering an improved tolerability profile with limited inflammation compared to other intravitreal approaches.

In addition, to our knowledge, 4D-150 is the first genetic medicine product candidate for the eye designed to directly inhibit four different angiogenic growth factor targets, VEGF A, B, and C plus PlGF. We therefore believe there is significant differentiation between our genetic medicine product candidate and other AAV genetic medicines in development in this therapeutic area.

In addition to genetic medicine approaches, other product candidates designed for extended durability are in development, with the potential to extend dosing intervals by several weeks. We believe a backbone therapy, like 4D-150, designed to provide potentially lifelong benefit with a one-time treatment, would be paradigm-shifting and highly differentiated from interval extension approaches.

We have received Regenerative Medicine Advanced Therapy ("RMAT") from the U.S. Food and Drug Administration (the “FDA”) and PRIority MEdicine ("PRIME") designation from the European Medicines Agency (the “EMA”) for 4D-150 for the treatment of wet AMD and RMAT designation for 4D-150 for treatment of DME, which highlights recognition from regulatory bodies of the potential of 4D-150 to address significant unmet medical needs for both wet AMD and DME.

Clinical Development of 4D-150 in Wet AMD: PRISM Phase 1/2 and 4FRONT Phase 3 Program

4D-150 is currently being evaluated in wet AMD in the ongoing PRISM Phase 1/2 clinical trial and ongoing 4FRONT global Phase 3 registrational program, which includes two Phase 3 clinical trials (4FRONT-1 and 4FRONT-2).

PRISM enrolled patients with severe, recalcitrant disease with high anti-VEGF treatment burden (Phase 1/2a, 25 patients dosed with Phase 3 dose of 3E10 vg/eye) and with broad disease activity and treatment burden (Phase 2b, 30 patients dosed with Phase 3 dose). Within the Phase 2b Phase 3 dose arm, a subgroup of 15 recently diagnosed patients were enrolled, which is most comparable to our Phase 3 population. In addition, 16 patients were dosed with 3E10 vg/eye in the Phase 2 Alternate Steroids cohort. In total, 71 patients have been dosed with the Phase 3 dose of 3E10 vg/eye.

Interim Data from 4D-150 PRISM Clinical Trial in Wet AMD

In November 2025, we reported positive long-term interim results from Phase 1/2a and 2b of PRISM. As of the most recent data cutoff date (August 22, 2025):

- 4D-150 demonstrated consistent and durable benefit across all three patient cohorts as evidenced by maintenance of visual acuity, control of retinal anatomy and reduction of treatment burden at all time points with up to 2 years of follow-up. Treatment burden reduction results were as follows:

Treatment Burden Reduction Following 4D-150
(Mean Supplemental Injections vs Comparator)

Cohorts:	Through Year 1	Through Year 1.5 (Phase 2b) & Year 2 (Phase 1/2a)
Phase 2b[1] Subgroup: Recently Diagnosed (Ph 3 comparable)	94%	92%
Phase 2b[1]: Broad	83%	82%
Phase 1/2a[2]: Severe, Recalcitrant	83%	79%

[1]Compared to projected aflibercept 2mg Q8 weeks (Phase 3 comparator)
[2]Compared to mean injections in prior 12 months

- Durability was Maintained Consistently Across 6-Month Intervals Through 1.5 to 2 Years:

Mean Supplemental Anti-VEGF Injections per Patient by 6-month Segments Post-4D-150

Cohorts:	0 to 6 Months *Includes impact of 4D-150 & aflibercept loading dose(s)**	6 to 12 Months	12 to 18 Months	18 to 24 Months
Phase 2b Subgroup: Recently Diagnosed (Ph 3 comparable)	*0.1*	0.2	0.4	*pending*
Phase 2b: Broad	*0.4*	0.6	0.6	*pending*
Phase 1/2a: Severe, Recalcitrant	*0.5*	1.3	1.2	1.2

*Week –1 in Phase 1/2a, Week –1 & 4 in Phase 2b

- 4D-150 continued to be well tolerated with no new safety or intraocular inflammation findings, with up to 3.5 years of follow-up
    - Within approximately the first 28 weeks post-4D-150 dosing, 2.8% (2 of 71) of patients had 4D-150-related 1+ (mild) intraocular inflammation (IOI) (SUN/NEI scales), which were transient 1+ vitreous cells noted at a single timepoint
    - Following the first 28 weeks post-4D-150 dosing, no new cases of inflammation with approximately 1.5 to more than 3.5 years of follow-up on all patients as of the data cutoff
    - 99% (70 of 71) completed steroid prophylaxis taper on schedule and remained completely off steroids
    - No 4D-150-related hypotony, endophthalmitis, vasculitis, occlusive/non-occlusive retinal vasculitis or choroidal effusions observed to date

4FRONT Global Phase 3 Registration Program in Wet AMD

The 4FRONT global Phase 3 registration program consists of two multicenter, randomized, double masked, aflibercept Q8W comparator-controlled trials, with the primary endpoint of BCVA noninferiority of 4D-150 3E10 vg/eye to aflibercept 2mg Q8W at 52 weeks. The first trial 4FRONT-1 is being conducted in North America and is enrolling a treatment-naïve population and the second trial 4FRONT-2 is being conducted globally and is enrolling both treatment-naïve and previously treated, recently diagnosed population. Target enrollment per study is 480 patients randomized 1:1 to 4D-150 or the aflibercept comparator arm, providing approximately 90% power with a noninferiority margin of 4 letters as aligned with the Japan Pharmaceuticals and Medical Devices Agency and EMA and over 90% power with a noninferiority margin of 4.5 letters per FDA guidance.

In March 2025, we initiated 4FRONT-1. Subsequently in February 2026, we announced enrollment completion within an approximately 11-month period, ahead of initial projections, with the trial overenrolled and expected to exceed 500 patients randomized, reflecting strong interest from investigators and patients. We continue to anticipate topline data with the 52-week primary endpoint in the first half of 2027.

In June 2025, we initiated 4FRONT-2, with enrollment completion expected in the second half of 2026. We anticipate topline data with the 52-week primary endpoint in the second half of 2027.

Clinical Development of 4D-150 in DME: SPECTRA Phase 1/2 Clinical Trial

The SPECTRA Phase 1/2 clinical trial assesses 4D-150 in patients with DME. The trial design consists of a Dose Confirmation cohort (Part 1) followed by a randomized, masked Dose Expansion cohort (Part 2). In the Dose Confirmation cohort, patients were sequentially enrolled to one of three dose arms of 4D-150 (5E9, 1E10 and 3E10 vg/eye). In the Dose Expansion cohort (Part 2, N=54), patients were to be randomized 1:1:1 to one of two doses of 4D-150 or aflibercept. In January 2025, we announced FDA feedback that based on interim data and plans reviewed to-date, we may proceed into Phase 3 and Part 2 was no longer necessary. We do not currently intend to enroll Part 2.

Interim Data from Part 1 of 4D-150 SPECTRA Clinical Trial in DME

In July 2025, we announced positive 60-week topline interim data from Part 1 of the SPECTRA clinical trial. Based on the results, 3E10 vg/eye was selected as the Phase 3 dose. As of the most recent data cutoff date (May 2, 2025):

- Safety (n=22):
  - 4D-150 was well tolerated with no intraocular inflammation at any timepoint
  - All patients completed the 16-week topical corticosteroid taper on schedule and remained completely off steroids
  - No hypotony, endophthalmitis, vasculitis, choroidal effusions or retinal artery occlusions

- Efficacy Results Through 60 Weeks:
  - Phase 3 Dose (N=9):
    - Sustained gain of BCVA of +9.7 letters
    - Sustained reduction of CST, as measured by OCT, of -174 µm
  - Supplemental injections:
    - Post-aflibercept loading doses (3), patients treated with Phase 3 dose required substantially fewer supplemental injections compared to patients receiving lower doses (1E10 and 5E9 vg/eye, N=11 evaluable) or projected on-label aflibercept 2mg Q8W (expected Phase 3 comparator):
      - Mean injections per patient:
        - Phase 3 dose: 1.6
        - Lower doses: 3.7
        - Projected on-label aflibercept 2mg Q8W: 7.0
        - Dose response observed for Phase 3 dose vs. lower doses (58% fewer injections)
        - Phase 3 dose demonstrated a reduction of 78% vs. projected on-label aflibercept 2mg Q8W
      - 0-1 injections:
        - 5 of 9 overall (Phase 3 dose) vs. 2 of 11 (lower doses)
      - Injection-free:
        - 4 of 9 overall (Phase 3 dose) vs. 1 of 11 overall (lower doses)

In January 2025, we also announced alignment with the FDA that a single Phase 3 clinical trial would be acceptable as the basis of a biologics license application ("BLA") submission for 4D-150 in DME. This decision was based on the data generated for 4D-150 in both the SPECTRA and PRISM clinical trials combined with data from the two planned Phase 3 clinical trials in the 4FRONT wet AMD program. Per FDA feedback, we may proceed to Phase 3 and are aligned with key design elements of a Phase 3 clinical trial with approximately 300-400 patients total with a primary endpoint of BCVA noninferiority vs. on-label aflibercept 2mg (5 loading doses and Q8W), and revised supplemental injection criteria (less stringent compared to Part 1 SPECTRA, in line with prior successful Phase 3 DME clinical trials). Protocol alignment across global agencies is ongoing and a single global Phase 3 clinical trial is expected to initiate in the third quarter of 2026.

Pulmonology Therapeutic Area

Introduction

We are developing product candidates to treat lung diseases. Our customized and evolved vector, A101, is used in all of our pulmonology disease product candidates. A101 was invented for aerosol delivery leading to transgene expression throughout all regions of the airways and alveoli, as well as resistance to pre-existing antibodies in humans. We believe that this modular product approach, utilizing A101 for multiple product candidates by switching the therapeutic transgene, increases product development efficiencies, decreases development risks and informs clinical development of subsequent product candidates using the same vector.

Our first pulmonology product candidate is 4D-710 for cystic fibrosis lung disease. We are currently enrolling the Phase 2 portion of the AEROW Phase 1/2 clinical trial in people with CF with funding from and in collaboration with the CF Foundation.

Our second pulmonology product candidate is 4D-725 for alpha-1 antitrypsin deficiency lung disease. 4D-725 is currently in preclinical development and fully funded by the California Institute for Regenerative Medicine through IND filing.

4D-710 for Cystic Fibrosis Lung Disease

Disease Background, Unmet Medical Need, and Target Patient Population

CF is the most common fatal inherited disease in the United States and results from mutations in the CFTR gene. CF causes impaired lung function, inflammation, and bronchiectasis and is commonly associated with repeat and persistent lung infections due to the inability to clear thickened mucus from the lung, often resulting in frequent exacerbations and hospitalizations and eventual end-stage respiratory failure. There is no cure for CF, and the median age of death for people is approximately 40 years in developed countries. CF is considered a rare, or orphan, disease by both the FDA and the EMA.

According to the CF Foundation, nearly 40,000 people in the United States and an estimated 105,000 people worldwide are living with CF, and approximately 1,000 new cases are diagnosed in the United States each year. People with CF require lifelong treatment with multiple daily medications, frequent hospitalizations and, ultimately, lung transplants. The quality of life for people with CF is further compromised as a result of spending significant time on self-care every day and frequent outpatient doctor visits and hospitalizations.

Until recently, approved therapies to treat people with CF were only designed to treat the manifestations of CF, for example by preventing and controlling infections that occur in the lungs, rather than addressing the underlying cause of the disease. Accordingly, antibiotics are frequently used along with mucus-thinning drugs.

More recently, a new class of drugs called modulators target CFTR for people with certain gene variants. Several therapies from Vertex Pharmaceuticals Inc. have been approved for marketing in the United States and the European Union based on their ability to improve lung function in genetically defined subsets of CF. In 2019, the FDA approved a triple drug therapy with Trikafta (elexacaftor/ivacaftor/tezacaftor), which Vertex believes would be applicable for up to 90% of people with CF, leaving at least 10% with no CFTR-targeted options. While these therapies improve lung function, they fall short of restoring it to the normal range in most people, and these chronic therapies require daily dosing for the person's lifetime. In addition, the existing CF drugs have been associated with tolerability issues, thus limiting their use in some people.

We believe there is a clinical need and market opportunity for a durable aerosolized therapy, delivered by breath-actuated nebulizer, that can restore normal CFTR function across all people with CF, including people who are receiving combination CFTR-modulator therapies and/or do not have appreciable CFTR protein expression and are therefore not amenable to CFTR modulators. We expect to explore single agent therapy with 4D-710 initially in people whose disease is not amenable to CFTR modulators (estimated to include approximately 15% of people with CF who have null variants or are unable to tolerate modulators), and to explore single agent or combination therapy with CFTR modulators for the remaining approximately 85% of people with CF.

Our Solution

We are developing 4D-710 as a durable, redosable, variant-agnostic disease-modifying therapy for people with CF lung disease. 4D-710 is designed for efficient aerosol delivery to the proximal and distal airways and alveoli, subsequent mucus barrier penetration, lung epithelial cell transduction, and resistance to pre-existing antibodies. The intended result is to achieve CFTR expression within lung epithelial cells for correction of CF lung disease. 4D-710 is comprised of our customized and evolved vector, A101, and a codon-optimized version of a synthetic truncated CFTR transgene *CFTRΔR*. *CFTRΔR* is a construct that retains the most critical functional components of the full-size CFTR gene and is small enough to fit within AAV vector packaging constraints, and is shown to have normal function and regulation in nonclinical studies. Based on nonclinical and clinical studies with other AAV programs, we expect redosing 4D-710 will be feasible.

Initially, we plan to focus on the approximately 15% of all people with CF who are not amenable to CFTR modulators as we believe these people have the highest unmet need. In people with CFTR variants that are amenable to modulators, many do not regain or cannot preserve lung function. Further, these chronic therapies require daily dosing for the person's lifetime. We therefore expect to eventually develop 4D-710 in this population, as a single agent and/or in combination with these CFTR modulators.

4DMT Differentiation: AAV Genetic Medicines for Cystic Fibrosis Lung Disease

A number of biotechnology companies have pursued genetic medicine solutions to treat cystic fibrosis. We believe these prior attempts to deliver AAV genetic medicine to the lungs of people with CF have failed due to an inability of conventional AAV vectors to penetrate through the lung mucus barrier and transduce lung cells efficiently. Further, we believe antibody neutralization of AAV likely also played a role in the lack of efficacy, as the mucosal immune system actively transports large quantities of antibodies into all mucus secretions, including on the lung mucosa.

While a number of companies are currently pursuing other genetic medicine solutions utilizing liposomes, herpesvirus, lentivirus, or conventional AAV vectors, these product candidates are in early stages of development. Moreover, they are not, to our knowledge, comprised of AAV vectors evolved in primates for aerosol delivery diffusely throughout the lung airways and alveoli. In addition, we believe these products were not designed for resistance to pre-existing antibodies to conventional AAVs, which is potentially a key requirement for successful delivery in the lung. As a result, to our knowledge, 4D-710 is the only AAV genetic medicine product candidate in development designed specifically with a vector selected for aerosol delivery in primates, including humans, and with resistance to antibodies in the human population.

We believe 4D-710 has the potential to be differentiated from approved agents, and those in clinical development to our knowledge, on the basis of four features:

1. Corrective mechanism-of-action: An aerosol dose of 4D-710 is designed to result in therapeutic levels of the CFTR protein directly within target cells lining the airway.
2. Long duration therapy: Unlike CFTR-targeted small molecules that require daily dosing for a person's entire life or liposomal and herpesvirus delivered genetic medicines that are being studied for dosing every few days to weeks, 4D-710 is designed for significantly less frequent dosing.
3. CFTR mutation-independent efficacy: Unlike CFTR-targeted small molecules that are only effective against specific mutations, 4D-710 is designed to be used in people with CF with any mutation, including in the approximately 15% of people whose disease is not amenable to standard medical therapy.
4. Resistance to AAV antibodies: Unlike conventional AAV vectors, which are sensitive to anti-AAV antibody inhibition, 4D-710 utilizes A101, a vector invented for resistance to human antibody inhibition.

Clinical Development: AEROW Phase 1/2 Clinical Trial

The AEROW Phase 1/2 clinical trial is a multicenter, open-label, dose-escalation and dose-expansion trial of 4D-710 in people with cystic fibrosis who are ineligible for CFTR modulator therapy or who have discontinued therapy due to adverse effects. The primary endpoint of the trial is safety and tolerability. Secondary endpoints include assessments of clinical activity including lung function, quality of life, and transgene delivery and CFTR expression as measured from bronchoscopic samples. The trial is being conducted within the Cystic Fibrosis Therapeutics Development Network, the largest CF clinical trials network in the world.

Interim Data from Phase 1 Stage of 4D-710 AEROW Clinical Trial in Cystic Fibrosis

In December 2025, we announced positive interim clinical data. The interim clinical data focused on safety, transgene expression, and clinical activity for 16 participants enrolled across four Phase 1 dose cohorts (2E15, 1E15, 5E14 and 2.5E14 vg).

The interim results, with best available data through December 1, 2025, included:

- Safety Data
  - No new pulmonary or other safety events occurred since previous update in higher-dose cohorts (1E15 and 2E15 vg) with up to 3.5 years of follow-up
  - In lower-dose cohorts (4 to 24 months of follow-up), 4D-710-related adverse events were generally mild, transient and resolved by 2 months, with no 4D-710-related severe adverse events
- Biopsy Data
  - In biopsies collected approximately 4 weeks post-dosing, consistent and dose-dependent CFTR transgene RNA levels at or above physiologically relevant levels in non-CF control samples across all dose levels
    - In 2.5E14 vg dose cohort, results met target expression profile
  - Durable CFTR transgene expression within or above target therapeutic range through at least 1 year across all dose levels as measured from optional paired biopsies collected at or beyond 1 year post-dosing

- In 2.5E14 vg dose cohort, consistent evidence of clinically meaningful activity detected in all endpoints, including ppFEV$_1$, LCI$_{2.5}$ and quality of life (CFQ-R-R) through 1 year
- Based on evaluation of safety, tissue expression and efficacy data, 2.5E14 vg was selected as the Phase 2 dose

The 4DMT Therapeutic Vector Evolution Platform: One Billion Synthetic Capsid Sequences for Targeted Genetic Medicines

Genetic medicines hold tremendous promise as a transformative therapeutic class. However, the majority of genetic medicines have encountered limitations such as inflammation and toxicity, high dose requirements, limited efficacy, and neutralization by pre-existing antibodies, due in part to their utilization of conventional AAV vectors that are naturally occurring and non-targeted. Through our Therapeutic Vector Evolution Platform, we apply the principles of directed evolution to invent targeted and evolved vectors for the delivery of genes to specific tissue types to treat diseases involving those same target tissue(s). Our product candidates are designed and engineered to utilize our targeted and evolved vectors to potentially address the limitations encountered with genetic medicines utilizing conventional AAV vectors.

The first step of directed evolution involves the generation of a diverse library of biological variants. Leveraging a wide range of molecular biology techniques, we have developed a collection of highly diverse and distinct libraries that are comprised of approximately one billion synthetic capsid sequences. We next define a Target Vector Profile that identifies the optimal vector features for the specific tissue type(s) and related set of diseases we seek to target, with the goal of overcoming limitations encountered by conventional AAVs. We then deploy TVE with our capsid libraries in NHPs and use competitive selection to identify targeted and evolved vectors from our libraries that demonstrate the strongest match to the Target Vector Profile. Subsequently, we characterize and evaluate a lead targeted and evolved vector for delivery and transgene expression through extensive studies in NHPs and human cell and organotypic tissue assays.

We believe our proprietary vectors will allow us to overcome known limitations of conventional AAV vectors, and to potentially address a broad range of diseases that affect both large and rare patient populations that cannot be addressed with conventional vectors.

Our proprietary Therapeutic Vector Evolution Platform is based on the principles of directed evolution. Directed evolution is a high-throughput platform approach that harnesses the power of evolution in order to create biologics with new and desirable characteristics.

Since our founding in 2013, we have developed and industrialized our Therapeutic Vector Evolution Platform to invent customized and evolved vectors for use in human therapeutic products. In addition, we have developed significant experience in performing TVE programs in NHPs. We have patent applications and issued patents covering hundreds of proprietary, unique AAV capsid vectors. We believe these proprietary customized vectors will give us significant competitive advantages to develop product candidates for a broad range of large market and rare disease patient populations, including those other genetic medicines cannot address.

Diverse Sub-Libraries of Synthetic Capsid Sequences

Each sub-library results from the application of a different genetic diversification methodology, such as variable loop mutagenesis, random peptide insertion, random point mutagenesis, DNA shuffling, and ancestral reconstruction, and is also defined by its starting material (AAV capsid gene sequences). We also apply bioinformatics, emerging technologies, experience and know-how resulting from previous discovery programs to continually improve and expand our libraries and improve our ability to invent customized and evolved vectors.

We believe the size and diversity of our proprietary synthetic capsid libraries represent a differentiating competitive advantage for us in the field of genetic medicines.

The Target Vector Profile Followed by Competitive Vector Selection

We employ a rigorous approach to inventing customized and evolved vectors based on what we consider an optimal vector and product profile, which we term the Target Vector Profile, for any disease or set of diseases affecting the same tissue(s). The Target Vector Profile includes any combination of the following: the target cell(s), the desired distribution of vector transduction within the target organ(s), the optimal route of administration for targeting the specific tissue(s), the optimal dose range, overall biodistribution, and resistance to human pooled antibodies.

We use our Therapeutic Vector Evolution Platform to select the "fittest" customized and evolved capsid that best matches our Target Vector Profile. We achieve this through serial rounds of "selection," or discovery, *in vivo* in primates with each round of selection funneling down to fewer and fewer remaining synthetic capsids from the original library. This funneling process is achieved by applying selective pressures—forcing competition—among all synthetic capsid variants in the library to achieve delivery to the target cells as defined in the Target Vector Profile. Each round is performed in a primate *in vivo*, sometimes in the presence of human antibodies.

We believe this deliberate approach to selection *in vivo* in primates and in human tissues should lead to identification of customized and evolved vectors with a higher likelihood of therapeutic benefit in humans.

Vector Invention Results to Date

We have completed unique vector selection programs or "selection processes" for specific proprietary synthetic capsids with specific Target Vector Profiles. Across our clinical development and discovery portfolio, we have utilized four different routes of administration: intravitreal, aerosol, intravenous, and intrathecal. We have completed discovery programs targeting a diverse array of tissue types including various retinal cell types, heart and skeletal muscle tissues, different lung cell types, liver, brain, dorsal root ganglia, and synovial joints, resulting in hundreds of unique and proprietary customized and evolved vectors.

Characterization of Novel Vector Variant "Hits" and "Leads"

Vector hits are typically characterized by three major criteria: manufacturability, human cell and human organotypic model transduction, and delivery to tissues in NHPs by the designated route of administration. Vector hits may also be evaluated for transduction in the presence of pooled human antibodies. In order to perform characterization studies, vectors are armed with marker transgene payloads such as enhanced green fluorescent protein ("EGFP"). A lead vector is selected after evaluation of these hits.

Competition

We are aware of several companies focused on developing genetic medicines in various indications as well as companies addressing methods for modifying genes and regulating gene expression. We may also face competition from large and specialty pharmaceutical and biotechnology companies, academic research institutions, government agencies and public and private research institutions with genetic medicine and other therapeutic approaches.

We consider our most direct competitors in late-stage development with respect to 4D-150 for the treatment of retinal vascular diseases including wet AMD and DME to be late-stage AAV-based anti-VEGF genetic medicine programs including ABBV-RGX-314 from AbbVie Inc. and REGENXBIO Inc. (subretinal delivery in Phase 3 for wet AMD; suprachoroidal delivery initiating Phase 3 for diabetic

retinopathy and in Phase 2 for wet AMD) and Ixo-Vec from Adverum Biotechnologies Inc., now a subsidiary of Eli Lilly and Company (intravitreal delivery in Phase 3 for wet AMD, previously discontinued in diabetic populations). We also face competition from late-stage sustained release VEGF receptor tyrosine kinase inhibitor programs at EyePoint Inc. and Ocular Therapeutix Inc., anti-VEGF and IL-6 antibody biopolymer conjugate programs from Kodiak Sciences Inc, and Wnt signaling-pathway tri-specific antibody program from Merck & Company Inc. Currently marketed products include EYLEA (aflibercept) from Regeneron Pharmaceuticals Inc., which is the current standard of care, and a combination of antibody-based programs including, but not limited to, LUCENTIS, SUSVIMO, VABYSMO from Roche, and EYLEA HD from Regeneron Pharmaceuticals Inc.

We consider our most direct competitors with respect to 4D-175 for the treatment of geographic atrophy to be Apellis Pharmaceuticals Inc.'s C3 inhibitor SYFOVRE (approved by FDA in 2023) and Astellas Pharma Inc.'s C5 inhibitor IZERVAY (approved by FDA in 2023). We are also aware of other mid- to late-stage programs including but not limited to Annexon Biosciences, Inc.'s C1q inhibitor ANX007, Belite Bio, Inc's retinol binding protein 4 binder tinlarebant, Johnson & Johnson's AAV genetic medicine encoding CD59 JNJ-81201887, Regeneron Pharmaceuticals Inc.'s anti-C5 antibody pozelimab developed in combination with Alnylam Pharmaceuticals, Inc.'s RNAi therapeutic targeting C5 cemdisiran, Sanofi's AAV genetic medicine encoding C1s and Bb inhibitors SAR446597, and Stealth BioTherapeutics Inc.'s mitochondrial cardiolipin binder elamipretide.

We consider our most direct competitors with respect to 4D-710 for the treatment of CF lung disease to be Vertex Pharmaceuticals Incorporated, which has several approved CFTR modulators, as well as other companies in preclinical/early-clinical development of CF products, including Vertex Pharmaceuticals Incorporated, Sionna Therapeutics Inc., Krystal Biotech Inc., Arcturus Therapeutics Holdings Inc. and Recode Therapeutics, Inc.

Manufacturing

CMC Strategy

In order to fulfill our strategy to maximize the robustness and internal control of our manufacturing processes from discovery and process development through to clinical-grade current Good Manufacturing Practices ("cGMP") manufacturing, we have designed and are continually developing and scaling our in-house manufacturing platform for both GMP and non-GMP manufacturing. While many companies in the AAV genetic medicine field outsource their process development and manufacturing to other companies or academic manufacturing centers, in contrast, our manufacturing processes were developed internally using internal technology transfers from our own process development labs. Our current in-house manufacturing capabilities include GMP manufacturing (upstream, downstream and fill/finish), production capabilities for late-phase clinical trials, IND-enabling Good Laboratory Practice ("GLP") toxicology studies, and research candidate production. We also collaborate with contract development and manufacturing organizations ("CDMOs") to supplement our internal capacity, and expect to rely on CDMOs for potential commercial supply.

cGMP Capabilities

Our team has extensive experience with the manufacturing and analytical testing of numerous unique AAV capsids. Our team has internally manufactured over 300 unique AAV vectors, including both proprietary evolved 4DMT capsid variants and naturally occurring capsids. Our team has manufactured over 500 total lots of AAV vectors for research or clinical use. This total also includes multiple lots of product candidate material for GLP toxicology and biodistribution studies. We have in-house cGMP manufacturing capabilities for clinical trial material production. Our manufacturing team has completed and released 28 lots of clinical trial material for six product candidates in current or previous clinical development. Leveraging internal testing capabilities in addition to qualified contract testing laboratories, we fully test and release our GLP and GMP lots for use in toxicology and clinical trials, respectively. We have developed and qualified assays for characterization, in-process testing, and release and stability testing of our internally and externally manufactured proprietary AAV vectors.

Process Development Capabilities

We use robust, scalable and transferable manufacturing unit operations throughout both the vector characterization process and product development, which are both platform-specific and product-specific. The upstream manufacturing step involves triple plasmid transfections in an HEK293 mammalian production cell line. Downstream manufacturing steps for purification and concentration include multiple orthogonal column chromatography steps and tangential flow filtration. The downstream purification columns used in our process are from stable sources. Using internally developed manufacturing processes and testing, we characterize our novel capsids and payloads. In addition, leveraging internal expertise and capabilities, we package and test our novel vectors with payloads using internally developed manufacturing processes, including both adherent and suspension processes.

Manufacturing Facilities

Our manufacturing facilities are on site at company headquarters in Emeryville, California and include process development labs, an analytical development lab, QC lab, and a cGMP manufacturing facility. These process development facilities are designed for production of material for GLP toxicology and biodistribution studies. In addition, our cGMP facilities run at commercial scale (including adherent bioreactors and suspension stirred-tank reactors) and have provided materials for Phase 1 through Phase 3 clinical trial material.

Manufacturing Team

Our team of highly trained individuals is led by our Chief Technical Officer, Dr. Katy Barglow, and includes multiple Ph.D. scientists. Collectively, they have significant experience in viral vector manufacturing, chemistry-manufacturing-controls ("CMC"), regulatory affairs, analytical and process development, and quality assurance and controls. As of March 2026, our team had submitted 7 INDs, all of which have been granted clearance by the U.S. FDA, enabling our clinical candidates to advance to Phase 3 clinical development. Our team also has experience prior to 4DMT with manufacturing multiple viral vectors from preclinical studies through to multiple Phase 3 trials.

External Manufacturing

In addition to our in-house facilities, we have established a partnership with a leading global commercial CDMO for potential commercialization of 4D-150. We have successfully completed the tech transfer of produced and released Phase 3 batches using our intended commercial processes at this CDMO.

Intellectual Property

Our commercial success depends in part on our ability to obtain and maintain proprietary protection for our product candidates, manufacturing and process discoveries, and other know-how, to operate without infringing the proprietary rights of others and to prevent others from infringing our proprietary rights. Our policy is to seek to protect our proprietary position by, among other methods, filing U.S. and foreign patent applications related to our proprietary technology, inventions and improvements that are important to the development and implementation of our business. In particular, our patent strategy includes the filing of patent applications covering unique gene sequences selected through our TVE process. We also rely on trade secrets, know-how, continuing technological innovation and potential in-licensing opportunities to develop and maintain our proprietary position.

Our product and lead optimization candidates were discovered by us utilizing our proprietary technology. We have filed several non-provisional and provisional patent applications, all owned by us, relating to our product and lead optimization candidates in the United States and certain foreign countries and through the World Intellectual Property Organization that are directed to compositions of matter, dosing regimens, methods of treatment, medical uses, and formulations. We have also licensed several non-provisional patent applications, granted patents and international patent applications relating to our

targeted and evolved vector, A101, which is used in 4D-710 and 4D-725, and to other AAV-based technologies.

As of February 14, 2026, our solely owned patent portfolio includes eighteen granted U.S. patents and one hundred and thirty-five granted foreign patents; each of these patents is expected to expire between May 2037 and April 2042, excluding any additional term from patent term adjustment or patent term extension if appropriate maintenance and other governmental fees are paid. Our solely owned patent portfolio also includes sixteen pending U.S. non-provisional applications and one hundred and sixty-nine pending foreign applications. We expect that United States and European patents, if issued from pending applications in our solely owned portfolio, would expire between May 2037 and September 2045, excluding any additional term from patent term adjustment or patent term extension if appropriate maintenance and other governmental fees are paid. Additional patent term for the presently issued or later issued U.S. patents may be awarded as a result of the patent term extension provision of the Hatch-Waxman Amendments of 1984. Similarly, in the European Union member countries, a supplementary protection certificate, if obtained, provides up to an additional five years of market exclusivity. Our solely owned patent portfolio also includes nine pending U.S. provisional patent applications.

In other jurisdictions (currently, Argentina, Australia, Bahrain, Brazil, Canada, Chile, China, Colombia, Costa Rica, Egypt, Hong Kong, India, Indonesia, Iran, Israel, Japan, Korea, Kuwait, Malaysia, Mexico, New Zealand, Oman, Peru, Philippines, Qatar, Russia, Saudi Arabia, Singapore, South Africa, Taiwan, Thailand, United Arab Emirates, Ukraine, and Vietnam), patents, if issued on pending applications in our solely owned patent portfolio, where applicable, relating to our product and lead optimization candidates, including composition of matter, dosing regimen, method of treatment, medical uses, and formulations are expected to expire between May 2037 and September 2045, if the appropriate maintenance, renewal, annuity, and other government fees are paid. These patents and patent applications (if applicable), depending on the national laws, may benefit from extension of patent term in individual countries if regulatory approval of any of our product candidates is obtained in those countries. For example, in Japan, the term of a patent may be extended by a maximum of five years in certain circumstances.

As of February 14, 2026, our in-licensed U.C. Berkeley patent portfolio, relating to our vector, A101, and other AAV-based technologies, includes five granted U.S. patents and twenty-one granted foreign patents; each of these patents is expected to expire between August 2027 and June 2038, excluding any additional term from patent term adjustment or patent term extension if appropriate maintenance and other governmental fees are paid. Our in-licensed U.C. Berkeley patent portfolio also includes one pending U.S. non-provisional patent application and ten pending foreign patent applications. We expect that United States and European patents, if issued from applications in our in-licensed U.C. Berkeley portfolio would expire between August 2027 and June 2038, excluding any additional term from patent term adjustment or patent term extension if appropriate maintenance and other governmental fees are paid.

As of February 14 2026, our in-licensed University of Pennsylvania patent portfolio includes two granted U.S. patents and ten granted foreign patents; each of these patents is expected to expire in September 2036, excluding any additional term from patent term adjustment or patent term extension if appropriate maintenance and other governmental fees are paid. Our in-licensed University of Pennsylvania patent portfolio also includes one pending U.S. non-provisional patent application and seven pending foreign patent applications. We expect that United States and European patents, if issued from applications in our in-licensed portfolio would expire in September 2036, excluding any additional term from patent term adjustment or patent term extension if appropriate maintenance and other governmental fees are paid.

In other jurisdictions (currently, for our in-licensed U.C. Berkeley patent portfolio, Australia, Brazil, Canada, China, Hong Kong, India, Japan, Korea and Mexico, and for our in-licensed University of Pennsylvania patent portfolio, Australia, Brazil, Canada, China, Israel, Japan, Korea and Hong Kong), patents, if issued on pending applications in our in-licensed patent portfolio, where applicable, relating to our product candidates, including composition of matter and various other patents, including dosage unit

form, method-of-treatment and medical use patents are expected to expire between August 2027 and June 2038 for our in-licensed U.C. Berkeley patent portfolio, and expire in September 2036 for our in-licensed University of Pennsylvania patent portfolio, if the appropriate maintenance, renewal, annuity, and other government fees are paid. These patents and patent applications (if applicable), depending on the national laws, may benefit from extension of patent term in individual countries if regulatory approval of any of our product or lead optimization candidates is obtained in those countries. For example, in Japan, the term of a patent may be extended by a maximum of five years in certain circumstances.

Individual patents extend for varying periods depending on the date of filing of the patent application or the date of patent issuance and the legal term of patents in the countries in which they are obtained. Generally, patents issued for regularly filed applications in the United States are effective for 20 years from the earliest effective non-provisional filing date. In addition, in certain instances, a patent term can be extended to recapture a portion of the U.S. Patent and Trademark Office ("USPTO") delay in issuing the patent as well as a portion of the term effectively lost as a result of the FDA regulatory review period. However, as to the FDA component, the restoration period cannot be longer than five years and the total patent term including the restoration period must not exceed 14 years following FDA approval. The duration of foreign patents varies in accordance with provisions of applicable local law, but typically is also 20 years from the earliest effective filing date. The actual protection afforded by a patent varies on a product by product basis, from country to country and depends upon many factors, including the type of patent, the scope of its coverage, the availability of regulatory-related extensions, the availability of legal remedies in a particular country and the validity and enforceability of the patent.

We also protect our trade secrets and other proprietary technology and processes, in part, by confidentiality and invention assignment agreements with our employees, consultants, scientific advisors and other contractors. These agreements may be breached, and we may not have adequate remedies for breach. In addition, our trade secrets may otherwise become known or be independently discovered by competitors. To the extent that our employees, consultants, scientific advisors or other contractors use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

Our commercial success will also depend in part on not infringing the proprietary rights of third parties. It is uncertain whether the issuance of any third-party patent would require us to alter our development or commercial strategies, alter our drugs or processes, obtain licenses or cease certain activities. Our breach of any license agreements or failure to obtain a license to proprietary rights that we may require to develop or commercialize our future drugs may have a material adverse impact on us.

Strategic Collaborations

Otsuka Pharmaceutical Co., Ltd.

On October 31, 2025, we entered into a Collaboration and License Agreement ("Otsuka Collaboration and License Agreement") with Otsuka Pharmaceutical Co., Ltd. ("Otsuka"), pursuant to which we granted Otsuka exclusive rights to develop and commercialize 4D-150 for retinal vascular diseases, including wet AMD and DME, in Japan, China, Australia, and other Asia-Pacific ("APAC") markets. Otsuka has agreed to lead all regulatory and commercialization activities in its licensed territories. We agreed to continue to lead all Phase 3 clinical activities globally, including within the APAC region. Otsuka made an upfront cash payment of $85.0 million and has agreed to provide certain cost sharing for global development activities. In addition, we are eligible for up to $335.5 million in potential regulatory and commercial milestone payments and tiered double-digit royalties depending on net sales in Otsuka's licensed territories. We retain full development and commercialization rights for 4D-150 outside the APAC region, including the United States, Latin America, and Europe.

The Otsuka Collaboration and License Agreement remains in effect, unless earlier terminated, on a country-by-country basis, until the date that Otsuka is no longer developing or commercializing the licensed product in such country within the licensed territory. Each party has the right to terminate the Otsuka Collaboration and License Agreement for the other party's material breach of its obligations under

the Otsuka Collaboration and License Agreement, subject to the right to cure such breach. Additionally, Otsuka may terminate the Otsuka Collaboration and License Agreement for convenience, on a country-by-country basis, upon sufficient prior written notice, or due to safety reasons or the failure of certain of our related clinical trials to achieve their primary endpoints. We may also terminate the Otsuka Collaboration and License Agreement upon notice if Otsuka challenges the patentability, enforceability, or validity of any licensed patent, unless Otsuka withdraws the challenge within a specified period, or if Otsuka ceases all development activities and commercialization of all licensed products in Japan for an agreed upon period and does not resume such activities or commercialization within a specified notice period, unless such cessation is substantially attributable to specified circumstances. Upon termination, any license granted by us to Otsuka will terminate.

Cystic Fibrosis Foundation

In 2016, we received a grant from Cystic Fibrosis Foundation ("CFF") in the amount of $525,000 to support discovery and development of product candidates to treat cystic fibrosis. The grant was increased to $3.5 million in 2017 and was subsequently amended to allocate the $3.5 million to different milestones. In August 2023, the grant agreement was further amended, which modified the research plan, increased the aggregate milestone payments from $3.5 million to $6.3 million and extended the estimated project completion date. The grant provides for repayment to CFF upon the commercialization of any product developed under the grant. In August 2023, we executed an amendment to the CF Foundation agreement increasing the funding commitment under that agreement by $2.8 million to a total of $6.3 million, which covers anticipated spend for further development of our aerosolized lung epithelium gene delivery vectors. The repayment is capped at nine times the grant actually paid to us.

In April 2020, CFF made a $10.0 million investment in our Series C redeemable convertible preferred stock financing. In return for the investment, CFF received shares of our Series C redeemable convertible preferred stock, and we and CFF entered into a Funding Agreement (the Funding Agreement). Pursuant to the terms of the Funding Agreement, we agreed to use the proceeds of the CFF investment to support development of 4D-710, our product candidate for the treatment of cystic fibrosis, and to match CFF's support for the product candidate. As provided under the Funding Agreement, following acceptance by the FDA in October 2021 of our IND for 4D-710 ("Acceptance"), CFF made an additional $4.0 million investment (the "Subsequent Investment"), in exchange for 125,715 shares of our common stock. We have agreed to use the additional $4.0 million from the Subsequent Investment to support development of 4D-710 and to match CFF's support of the product candidate. Under the terms of the Funding Agreement, neither the $10.0 million investment in the Series C redeemable convertible preferred stock nor the $4.0 million of funding upon Acceptance are restricted as to withdrawal or usage.

In October 2025, CFF purchased 776,398 shares of our common stock for $7.5 million. We agreed to use the proceeds of this investment to support continued development of 4D-710. We also agreed with CFF to form a Joint Steering Committee, with senior clinical development and regulatory expertise to enhance strategic planning, guidance, and coordination of 4D-710's development. In addition, this agreement between CFF and us in October 2025 provides that CFF will invest an additional $3.6 million in exchange for shares of our common stock subject to achievement of specific clinical milestones and at our option. This agreement between us and CFF in October 2025 does not modify our prior agreements with CFF.

Government Regulation

The FDA and other regulatory authorities at federal, state, and local levels, as well as in foreign countries, extensively regulate, among other things, the research, development, testing, manufacture, quality control, import, export, safety, effectiveness, labeling, packaging, storage, distribution, record keeping, approval, advertising, promotion, marketing, post-approval monitoring, and post-approval reporting of biological product candidates such as those we are developing. We, along with third-party contractors, will be required to navigate the various preclinical, clinical and commercial approval requirements of the governing regulatory agencies of the countries in which we wish to conduct studies or seek approval or licensure of our product candidates. The process of obtaining regulatory approvals and

the subsequent compliance with applicable federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources.

U.S. Biologics Regulation

In the United States, biological products are subject to regulation under the Federal Food, Drug, and Cosmetic Act (“FDCA”), the Public Health Service Act, and other federal, state, local and foreign statutes and regulations. The process required by the FDA before biologic product candidates may be marketed in the United States generally involves the following:

- completion of preclinical laboratory tests and animal studies performed in accordance with the FDA’s GLPs;
- submission to the FDA of an IND, which must become effective before clinical trials may begin;
- approval by an Institutional Review Board ("IRB") or ethics committee at each clinical site before the trial is commenced;
- performance of adequate and well-controlled human clinical trials to establish the safety and efficacy of the proposed biologic product candidate for its intended purpose;
- preparation of and submission to the FDA of a BLA after completion of all pivotal clinical trials;
- satisfactory completion of an FDA Advisory Committee review, if applicable;
- a determination by the FDA within 60 days of its receipt of a BLA to file the application for review;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities at which the proposed product is produced to assess compliance with current GMP and to assure that the facilities, methods and controls are adequate to preserve the biological product’s continued safety, purity and potency, and of selected clinical investigation sites to assess compliance with Good Clinical Practices (“GCP”); and
- FDA review and approval of the BLA to permit commercial marketing of the product for particular indications for use in the United States.

Prior to beginning the first clinical trial with a product candidate in the United States, we must submit an IND to the FDA. An IND is a request for authorization from the FDA to administer an investigational new drug product to humans. The central focus of an IND submission is on the general investigational plan and the protocol(s) for clinical trials. The IND also includes results of animal and *in vitro* studies assessing the toxicology, pharmacokinetics, pharmacology, and pharmacodynamic characteristics of the product; chemistry, manufacturing, and controls information; and any available human data or literature to support the use of the investigational product. An IND must be allowed to proceed by the FDA before human clinical trials may begin. The IND automatically goes into effect within 30 days after receipt by the FDA, unless the FDA, within the 30-day time period, raises safety concerns or questions about the proposed clinical trial. In such a case, the IND may be placed on clinical hold and the IND sponsor and the FDA must resolve any outstanding concerns or questions before the clinical trial can proceed. Submission of an IND therefore may or may not result in FDA authorization to begin a clinical trial.

In addition to the submission of an IND to the FDA, under the National Institutes of Health (“NIH”) Guidelines for Research Involving Recombinant DNA Molecules (“NIH Guidelines”), supervision of certain human gene transfer trials may also require evaluation and assessment by an institutional biosafety committee (“IBC”), a local institutional committee that reviews and oversees research utilizing recombinant or synthetic nucleic acid molecules at that institution. The IBC assesses the safety of the research and identifies any potential risk to the public health or the environment, and such assessment may result in some delay before initiation of a clinical trial. While the NIH Guidelines are not mandatory unless the research in question is being conducted at or sponsored by institutions receiving NIH funding

of recombinant or synthetic nucleic acid molecule research, many companies and other institutions not otherwise subject to the NIH Guidelines voluntarily follow them.

Clinical trials involve the administration of the investigational product to human subjects under the supervision of qualified investigators in accordance with GCP, which include the requirement that all research subjects provide their informed consent for their participation in any clinical study. Clinical trials are conducted under protocols detailing, among other things, the objectives of the study, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. A separate submission to the existing IND must be made for each successive clinical trial conducted during product development and for any subsequent protocol amendments. Furthermore, an independent IRB for each site proposing to conduct the clinical trial must review and approve the plan for any clinical trial and its informed consent form before the clinical trial begins at that site and must monitor the study until completed. Regulatory authorities, the IRB or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the subjects are being exposed to an unacceptable health risk or that the trial is unlikely to meet its stated objectives. Some studies also include oversight by an independent group of qualified experts organized by the clinical study sponsor, known as a data safety monitoring board, which provides authorization for whether or not a study may move forward at designated check points based on access to certain data from the study and may halt the clinical trial if it determines that there is an unacceptable safety risk for subjects or other grounds, such as no demonstration of efficacy. There are also requirements governing the reporting of ongoing clinical studies and clinical study results to public registries.

For purposes of BLA approval, human clinical trials are typically conducted in three sequential phases that may overlap or be combined:

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

In some cases, the FDA may require, or companies may voluntarily pursue, additional clinical trials after a product is approved to gain more information about the product within the approved indication. These so-called Phase 4 studies, in addition to other post-marketing clinical trials, registry studies or comparable post-marketing commitments or requirements, may also be made a condition to approval of the BLA.

While the IND is active, progress reports summarizing the results of the clinical trials and nonclinical studies performed since the last progress report, among other information, must be submitted at least annually to the FDA, and written IND safety reports must be submitted to the FDA and investigators for serious and unexpected suspected adverse events, findings from other studies suggesting a significant risk to humans exposed to the drug, findings from animal or in vitro testing suggesting a significant risk to humans exposed to the drug, and any clinically important increased rate of a serious suspected adverse reaction compared to that listed in the protocol or investigator brochure.

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

BLA Submission and Review by the FDA

Assuming successful completion of all required testing in accordance with all applicable regulatory requirements, the results of product development, including results from nonclinical studies and clinical trials are submitted to the FDA as part of a BLA requesting approval to market the product for one or more indications. The BLA must include all relevant data available from preclinical and clinical studies, including negative or ambiguous results as well as positive findings, together with detailed information relating to the product's chemistry, manufacturing, controls, and proposed labeling, among other things. Data can come from company-sponsored clinical studies intended to test the safety and effectiveness of a use of the product, or from a number of alternative sources, including studies initiated by investigators. The submission of a BLA requires payment of a substantial user fee to FDA, and the sponsor of an approved BLA is also subject to an annual program fee. A waiver of user fees may be obtained under certain limited circumstances. Additionally, no user fees are assessed on BLAs for products designated as orphan drugs, unless the product also includes a non-orphan indication.

In addition, the Pediatric Research Equity Act ("PREA"), requires a BLA sponsor to conduct pediatric clinical trials for most drugs, for a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration. Under PREA, original BLAs and certain supplements must contain a pediatric assessment unless the sponsor has received a deferral or waiver. The required assessment must evaluate the safety and effectiveness of the product for the claimed indications in all relevant pediatric subpopulations and support dosing and administration for each pediatric subpopulation for which the product is deemed safe and effective. The sponsor or FDA may request a deferral of pediatric clinical trials for some or all of the pediatric subpopulations. A deferral may be granted for several reasons, including a finding that the drug is ready for approval for use in adults before pediatric clinical trials are complete or that additional safety or effectiveness data needs to be collected before the pediatric clinical trials begin.

Within 60 days following submission of the application, the FDA reviews a BLA submitted to determine if it is substantially complete before the FDA accepts it for filing. The FDA may refuse to file any BLA that it deems incomplete or not properly reviewable at the time of submission and may request additional information. In this event, the BLA must be resubmitted with the additional information. Once a BLA has been accepted for filing, the FDA's goal is to review standard applications within ten months after the filing date, or, if the application qualifies for priority review, six months after the filing date. Priority review designation will direct overall attention and resources to the evaluation of applications for products that, if approved, would represent significant improvements in the safety or effectiveness in the treatment, diagnosis, or prevention of serious conditions. In both standard and priority reviews, the review process can be extended by three months for the FDA to review and respond to new information deemed a major amendment to the application. The FDA reviews a BLA to determine, among other things, whether a product is safe, pure and potent and the facility in which it is manufactured, processed, packed, or held meets standards designed to assure the product's continued safety, purity and potency. The FDA may also convene an advisory committee to provide clinical insight on application review questions. The FDA is not bound by recommendations of an advisory committee, but it considers such recommendations when making decisions regarding approval.

Before approving a BLA, the FDA will typically inspect the facility or facilities where the product is manufactured. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP and adequate to assure consistent production of

the product within required specifications. Additionally, before approving a BLA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP.

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

If regulatory approval of a product is granted, such approval will be granted for particular indications and may entail limitations on the indicated uses for which such product may be marketed. For example, the FDA may approve the BLA with a Risk Evaluation and Mitigation Strategy ("REMS"), to ensure the benefits of the product outweigh its risks. A REMS is a safety strategy to manage a known or potential serious risk associated with a medicine and to enable patients to have continued access to such medicines by managing their safe use, and could include medication guides, physician communication plans, or elements to assure safe use, such as restricted distribution methods, patient registries, and other risk minimization tools. The FDA also may condition approval on, among other things, changes to proposed labeling or the development of adequate controls and specifications. Once approved, the FDA may withdraw the product approval if compliance with pre- and post-marketing requirements is not maintained or if problems occur after the product reaches the marketplace. The FDA may also require one or more Phase IV post-market studies and surveillance to further assess and monitor the product's safety and effectiveness after commercialization and may limit further marketing of the product based on the results of these post-marketing studies.

Expedited Development and Review Programs

A sponsor may seek approval of its product candidate under programs designed to accelerate FDA's review and approval of drugs and biological products that meet certain criteria. Specifically, biological product candidates are eligible for fast track designation if they are intended to treat a serious or life-threatening disease or condition and demonstrate the potential to address unmet medical needs for the disease or condition. Fast track designation applies to the combination of the product candidate and the specific indication for which it is being studied. The sponsor of a fast track product candidate has opportunities for more frequent interactions with the applicable FDA review team during product development and, once a BLA is submitted, the application may be eligible for priority review. For a fast track product candidate, the FDA may consider sections of the BLA for review on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the application, the FDA agrees to accept sections of the application and determines that the schedule is acceptable and the sponsor pays any required user fees upon submission of the first section of the application. A fast track designated product candidate may also qualify for priority review, under which the FDA sets the target date for FDA action on the BLA at six months after the FDA accepts the application for filing.

A product candidate intended to treat a serious or life-threatening disease or condition may also be eligible for breakthrough therapy designation to expedite its development and review. A product candidate can receive breakthrough therapy designation if preliminary clinical evidence indicates that the product candidate, alone or in combination with one or more other drugs or biologics, may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. The designation includes all of the

fast track program features, as well as more intensive FDA interaction and guidance beginning as early as Phase 1 and an organizational commitment to expedite the development and review of the product candidate, including involvement of senior managers.

In 2017, the FDA established the regenerative medicine advanced therapy ("RMAT") designation as part of its implementation of the 21st Century Cures Act. The RMAT designation program is intended to fulfill the 21st Century Cures Act requirement that the FDA facilitate an efficient development program for, and expedite review of, any drug or biologic that meets the following criteria: (i) the drug or biologic qualifies as a RMAT, which is defined as a cell therapy, therapeutic tissue engineering product, human cell and tissue product, or any combination product using such therapies or products, with limited exceptions; (ii) the drug or biologic is intended to treat, modify, reverse, or cure a serious or life-threatening disease or condition; and (iii) preliminary clinical evidence indicates that the drug or biologic has the potential to address unmet medical needs for such a disease or condition. Based on the FDA's current interpretation of Section 506(g) of the FDCA (as added by Section 3033 of the 21st Century Cures Act), certain human gene therapies and xenogeneic cell products may also meet the definition of a regenerative medicine therapy. RMAT designation provides all the benefits of breakthrough therapy designation, including more frequent meetings with the FDA to discuss the development plan for the product candidate and eligibility for rolling review and priority review. Product candidates granted RMAT designation may also be eligible for accelerated approval on the basis of a surrogate or intermediate endpoint reasonably likely to predict long-term clinical benefit, or reliance upon data obtained from a meaningful number of clinical trial sites, including through expansion of trials to additional sites.

Any marketing application for a drug or biologic submitted to the FDA for approval, including a product candidate with a fast track designation, RMAT designation and/or breakthrough therapy designation, may be eligible for other types of FDA programs intended to expedite the FDA review and approval process, such as priority review and accelerated approval. A product candidate is eligible for priority review if it is designed to treat a serious or life-threatening disease or condition, and if approved, would provide a significant improvement in safety or effectiveness compared to available alternatives for such disease or condition. For original BLAs, priority review designation means the FDA's goal is to take action on the marketing application within six months of the 60-day filing date (as compared to ten months under standard review). Under the accelerated approval program, the FDA may approve a BLA on the basis of either a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. Post-marketing studies or completion of ongoing studies after marketing approval are generally required to verify the biologic's clinical benefit in relationship to the surrogate endpoint or ultimate outcome in relationship to the clinical benefit. In addition, the FDA currently requires as a condition for accelerated approval pre-approval of promotional materials, which could adversely impact the timing of the commercial launch of the product. FDA may withdraw approval of a biologic or indication approved under accelerated approval on an expedited basis if, for example, the sponsor fails to conduct required post-marketing trials in a timely manner or if such trials fail to verify the predicted clinical benefit of the product.

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

We have obtained RMAT designation for 4D-150 for the treatment of neovascular (wet) AMD, and we plan to seek additional expedited designations for some or all of our product candidates in which there is a medically plausible basis for the use of these products.

Orphan Drug Designation and Exclusivity

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biologic intended to treat a rare disease or condition, defined as a disease or condition with a patient population of fewer than 200,000 individuals in the United States, or a patient population greater than 200,000 individuals in the United States and when there is no reasonable expectation that the cost of developing and making available the drug or biologic in the United States will be recovered from sales in the United States for that drug or biologic. Orphan drug designation must be requested before submitting a BLA. After the FDA grants orphan drug designation, the generic identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA.

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

A designated orphan drug may not receive orphan drug exclusivity if it is approved for a use that is broader than the disease or condition for which it received orphan designation. In addition, orphan drug exclusive marketing rights in the United States may be lost if the FDA later determines that the request for designation was materially defective or, as noted above, if the second applicant demonstrates that its product is clinically superior to the approved product with orphan exclusivity within the relevant approved use or indication or the manufacturer of the approved product is unable to assure sufficient quantities of the product to meet the needs relating to the approved use or indication of patients with the relevant rare disease or condition. We have obtained orphan drug designation for 4D-710 for the treatment of cystic fibrosis.

Rare Pediatric Disease Priority Review Voucher Program

In 2012, the U.S. Congress authorized the FDA to award priority review vouchers to Sponsors of certain rare pediatric disease product applications. This program is designed to encourage development of new drug and biological products for prevention and treatment of certain rare pediatric diseases. Specifically, under this program, a sponsor who receives an approval for a drug or biologic for a “rare pediatric disease” may qualify for a voucher that can be redeemed to receive priority review of a subsequent marketing application for a different product. The Sponsor of a rare pediatric disease drug product receiving a priority review voucher may transfer (including by sale) the voucher to another sponsor. The voucher may be further transferred any number of times before the voucher is used, as long as the Sponsor making the transfer has not yet submitted the application. The FDA may also revoke any priority review voucher if the rare pediatric disease drug for which the voucher was awarded is not marketed in the U.S. within one year following the date of approval.

For purposes of this program, a “rare pediatric disease” is a (a) serious or life-threatening disease in which the serious or life-threatening manifestations primarily affect individuals aged from birth to 18 years, including age groups often called neonates, infants, children, and adolescents; and (b) rare diseases or conditions within the meaning of the Orphan Drug Act. Congress has only authorized the Rare Pediatric Disease Priority Review Voucher program until September 30, 2029. Consequently, unless Congress reauthorizes the program, the sponsor of the marketing application for a drug that receives

Rare Pediatric Disease Designation will only be eligible to receive a voucher if the FDA grants the designation on or before September 30, 2029.

Post-Approval Requirements

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

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

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;
- fines, warning letters, or untitled letters;
- clinical holds on clinical studies;
- refusal of the FDA to approve pending applications or supplements to approved applications, or suspension or revocation of product license approvals;
- product seizure or detention, or refusal to permit the import or export of products;
- consent decrees, corporate integrity agreements, debarment or exclusion from federal healthcare programs;
- mandated modification of promotional materials and labeling and the issuance of corrective information;
- the issuance of safety alerts, Dear Healthcare Provider letters, press releases and other communications containing warnings or other safety information about the product; or
- injunctions or the imposition of civil or criminal penalties.

The FDA closely regulates the marketing, labeling, advertising and promotion of biologics. A company can make only those claims relating to safety and efficacy, purity and potency that are approved by the FDA and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses. Failure to comply with these requirements can result in, among other things, adverse publicity, warning letters, corrective advertising and potential civil and criminal penalties. Physicians may prescribe legally available products for uses that are not described in the product's labeling and that differ from those tested by us and

approved by the FDA. Such off-label uses are common across medical specialties. Physicians may believe that such off-label uses are the best treatment for many patients in varied circumstances. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, restrict manufacturer's communications on the subject of off-label use of their products.

Biosimilars and Exclusivity

The Affordable Care Act, signed into law in 2010, includes a subtitle called the BPCIA, which created an abbreviated approval pathway for biological products that are biosimilar to or interchangeable with an FDA-licensed reference biological product. The FDA has issued several guidance documents outlining an approach to review and approval of biosimilars. Biosimilarity, which requires that there be no clinically meaningful differences between the biological product and the reference product in terms of safety, purity, and potency, can be shown through analytical studies, animal studies, and a clinical study(ies). Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product in any given patient and, for products that are administered multiple times to an individual, the biologic and the reference biologic may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic.

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

A biological product can also obtain pediatric market exclusivity in the United States. Pediatric exclusivity, if granted, adds six months to existing exclusivity periods and patent terms. This six-month exclusivity, which runs from the end of other exclusivity protection or patent term, may be granted based on the voluntary completion of a pediatric study in accordance with an FDA-issued "Written Request" for such a study.

Other Healthcare Laws

Pharmaceutical companies are subject to additional healthcare regulation and enforcement by the federal government and by authorities in the states and foreign jurisdictions in which they conduct their business. Such laws include, without limitation, U.S. federal and state anti-kickback, fraud and abuse, false claims, pricing reporting, and transparency laws and regulations with respect to payments and other transfers of value made to physicians and other healthcare professionals, as well as similar foreign laws in the jurisdictions outside the U.S. Violation of any of such laws or any other governmental regulations that apply may result in significant penalties, including, without limitation, administrative civil and criminal penalties, damages, disgorgement fines, additional reporting requirements and oversight obligations, contractual damages, the curtailment or restructuring of operations, exclusion from participation in government healthcare programs, and imprisonment.

Data Privacy and Security Laws

Pharmaceutical companies may be subject to domestic and foreign privacy, security and data breach notification laws, which are rapidly evolving in many jurisdictions worldwide. In the United States, federal and state health information laws may govern the collection, use, disclosure and protection of health-related and other personal information. In addition, certain foreign laws govern the privacy and security of personal data, including health-related data. Privacy and security laws, regulations, and other

obligations are constantly evolving, may conflict with each other to complicate compliance efforts, and can result in investigations, proceedings, or actions that lead to significant civil and/or criminal penalties and restrictions on data processing.

Coverage and Reimbursement

Sales of any pharmaceutical product depend, in part, on the extent to which such product will be reimbursed by third-party payors, such as federal, state and foreign government healthcare programs, commercial insurance and managed healthcare organizations, and the level of reimbursement for such product by third-party payors. Significant uncertainty exists as to the coverage and reimbursement status of any newly approved product, particularly for genetic medicine products where the Centers for Medicare & Medicaid Services ("CMS") and other third-party payors in the United States have not yet established a uniform policy of coverage and reimbursement. Decisions regarding the extent of coverage and amount of reimbursement to be provided are made on a plan-by-plan basis. One third-party payor's decision to cover a particular product does not ensure that other payors will also provide coverage for the product. As a result, the coverage determination process can require manufacturers to provide scientific and clinical support for the use of a product to each payor separately and can be a time-consuming process, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance. For products administered under the supervision of a physician, obtaining coverage and adequate reimbursement may be particularly difficult because of the higher prices often associated with such drugs. Additionally, separate reimbursement for the product itself or the treatment or procedure in which the product is used may be limited, which may impact physician utilization.

In addition, third-party payors are increasingly reducing reimbursements for pharmaceutical products and services. The U.S. government and state legislatures have continued implementing cost-containment programs, including price controls, restrictions on coverage and reimbursement and requirements for substitution of generic products. Third-party payors are increasingly challenging the prices charged, examining the medical necessity and reviewing the cost effectiveness of pharmaceutical products, in addition to questioning their safety and efficacy. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit sales of any product. Decreases in third-party reimbursement for any product or a decision by a third-party payor not to cover a product could reduce physician usage and patient demand for the product.

In international markets, reimbursement and healthcare payment systems vary significantly by country, and many countries have instituted price ceilings on specific products and therapies. For example, the European Union provides options for its member states to restrict the range of medicinal products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. A member state may approve a specific price for the medicinal product or it may instead adopt a system of direct or indirect controls on the profitability of us placing the medicinal product on the market. Pharmaceutical products may face competition from lower-priced products in foreign countries that have placed price controls on pharmaceutical products and may also compete with imported foreign products. Furthermore, there is no assurance that a product will be considered medically reasonable and necessary for a specific indication, will be considered cost-effective by third-party payors, that an adequate level of reimbursement will be established even if coverage is available, or that the third-party payors' reimbursement policies will not adversely affect the ability for manufacturers to sell products profitably.

Healthcare Reform

In the United States and certain foreign jurisdictions, there have been, and we expect there will continue to be, a number of legislative and regulatory changes to the healthcare system. In March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act (collectively the "ACA") was signed into law, which substantially changed the way healthcare is financed by both governmental and private insurers in the United States. The ACA contains a number of provisions, including those governing enrollment in federal healthcare programs,

reimbursement adjustments and fraud and abuse changes. Additionally, the ACA increased the minimum level of Medicaid rebates payable by manufacturers of brand name drugs from 15.1% to 23.1%; required collection of rebates for drugs paid by Medicaid managed care organizations; imposed a non-deductible annual fee on pharmaceutical manufacturers or importers who sell certain "branded prescription drugs" to specified federal government programs, implemented a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted, or injected; expanded eligibility criteria for Medicaid programs; created a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research; and established a Center for Medicare & Medicaid Innovation at CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending.

Since its enactment, there have been judicial, executive and Congressional challenges to certain aspects of the ACA. On June 17, 2021, the U.S. Supreme Court dismissed the most recent judicial challenge to the ACA without specifically ruling on the constitutionality of the ACA.

Other legislative changes have been proposed and adopted since the ACA was enacted, including aggregate reductions of Medicare payments to providers, which will remain in effect through 2032, with the exception of a temporary suspension from May 1, 2020 through March 31, 2022, absent additional Congressional action. In addition, on March 11, 2021, the American Rescue Plan Act of 2021 was signed into law, which eliminates the statutory cap on drug manufacturers' Medicaid drug rebate program liability, beginning January 1, 2024. The rebate was previously capped at 100% of a drug's average manufacturer price.

Moreover, there has recently been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several Congressional inquiries and proposed and enacted legislation designed, among other things, to bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs and reform government program reimbursement methodologies for pharmaceutical products. On August 16, 2022, the Inflation Reduction Act of 2022, or IRA, was signed into law. Among other things, the IRA requires manufacturers of certain drugs to engage in price negotiations with Medicare, 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 Department of Health and Human Services ("HHS") to implement many of these provisions through guidance, as opposed to regulation, for the initial years. CMS has published the negotiated prices for the initial ten drugs, which went into effect in January 2026, and the subsequent 15 drugs, which will first be effective in 2027, as well as the next set of 15 drugs that will be subject to price negotiations. HHS has issued and will continue to issue guidance implementing the IRA, although the Medicare drug price negotiation program is currently subject to legal challenges. While the impact of the IRA on the pharmaceutical industry cannot yet be fully determined, it is likely to be significant.

The One Big Beautiful Bill Act, which was enacted in July 2025, imposes significant reductions in the funding of the Medicaid program. Such reductions are expected to decrease the number of persons enrolled in Medicaid and reduce the services covered by Medicaid, which could adversely affect our sales of any product candidate that we commercialize.

The Trump administration is pursuing a two-fold strategy to reduce drug costs in the U.S. While it is unclear whether and how the Trump proposals will be implemented, the Trump policies are likely to have a negative impact on the pharmaceutical industry and on our ability to receive adequate revenues for any product candidate that we commercialize. On the one hand, President Trump has threatened to impose significant tariffs on pharmaceutical manufacturers that do not adopt pricing policies such as most favored nation pricing, which would tie the price for drugs in the U.S. to the lowest price in a group of other countries. In response, multiple manufacturers have reportedly entered into confidential pricing agreements with the federal government. On the other hand, the Trump administration is pursuing traditional regulatory pathways to impose drug pricing policies, and published two proposed regulations in

December 2025, referred to as Globe and Guard. If finalized, these regulations would implement mandatory payment models under which manufacturers of eligible drugs would be required to pay rebates to the federal government on a portion of the units of their drugs that are reimbursed by Medicare, with the rebate amount based on most favored nation pricing. Imposing a rebate in the U.S. that is based on drug prices outside the U.S. would mark a drastic and unprecedented shift in the U.S. pharmaceutical market, and while the impact of the Globe and Guard proposed regulations, if finalized, cannot yet be determined, it is likely to be significant. Even regulatory proposals or executive actions that are ultimately deemed unlawful could negatively impact the U.S. pharmaceutical sector and our business.

Individual states in the United States have also become increasingly active in implementing regulations designed to control pharmaceutical product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access, marketing cost disclosure, drug price reporting and other transparency measures. Some states have enacted legislation creating so-called prescription drug affordability boards, which ultimately may attempt to impose price limits on certain drugs in these states, and at least one state board is imposing an upper payment limit. Some states are also seeking to implement general, across the board price caps for pharmaceuticals, or are seeking to regulate drug distribution. Some measures are designed to encourage importation from other countries. These types of initiatives may result in additional reductions in Medicare, Medicaid, and other healthcare funding, and may otherwise affect the prices we may obtain for our investigational products that receive approval. Furthermore, there has been increased interest by third-party payors and governmental authorities in reference pricing systems and publication of discounts and list prices. Adoption of other new legislation or regulation at the federal, state, or foreign level could further limit reimbursement for pharmaceuticals, including our product candidates, if approved.

Employees and Human Capital

As of March 6, 2026, we had 196 full-time employees. Of these employees, 144 are engaged in research and development and 39 hold M.D. or Ph.D. degrees. Our employees are not represented by labor unions or covered by collective bargaining agreements. We consider our relationship with our employees to be good.

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

Facilities

We lease approximately 91,000 square feet of office, research and development, engineering, laboratory and warehouse space in Emeryville, California under lease agreements that expire between August 2026 and December 2030. We believe that our facilities are adequate to meet our current needs, and that suitable additional alternative spaces will be available in the future on commercially reasonable terms, if required.

Corporate Information

We were formed on September 12, 2013 as a Delaware limited liability company under the name 4D Molecular Therapeutics, LLC. On March 11, 2015, 4D Molecular Therapeutics, Inc. was incorporated as a Delaware corporation. On March 20, 2015, 4D Molecular Therapeutics, LLC merged with 4D Molecular Therapeutics, Inc., with 4D Molecular Therapeutics, Inc. being the surviving entity. Our principal executive offices are located at 5858 Horton Street #455, Emeryville, California 94608, and our telephone number is (510) 505-2680.

Available Information

Our website address is www.4dmoleculartherapeutics.com. The information on, or that can be accessed through, our website is not part of this Annual Report on Form 10-K. The U.S. Securities and Exchange Commission ("SEC") maintains an internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC at www.sec.gov. Our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to reports filed or furnished pursuant to Sections 13(a) and 15(d) of the Securities Exchange Act of 1934, as amended, (the "Exchange Act") are also available free of charge on our investor relations website as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC.

Item 1A. Risk Factors.

Investing in our common stock involves a high degree of risk. You should carefully consider the risks described below, as well as the other information in this report, including our financial statements and the related notes and the section of this report "Management's Discussion and Analysis of Financial Condition and Results of Operations," before deciding whether to invest in our common stock. If any of the following risks actually occur, our business, reputation, financial condition, results of operations, revenue and future prospects could be seriously harmed. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties that we are unaware of, or that we currently believe are not material, may also become important factors that adversely affect our business. Unless otherwise indicated, references to our business being seriously harmed in these risk factors and elsewhere will include harm to our business, reputation, financial condition, results of operations, future prospects and stock price. If our business is seriously harmed, the market price of our common stock could decline, and you could lose part or all of your investment.

Risks Related to Our Limited Operating History, Financial Condition and Capital Requirements

We are in the late stages of drug development for our lead program and have a limited operating history and no products approved for commercial sale, which may make it difficult to evaluate our current business and predict our future success and viability.

We are a leading late-stage biotechnology company advancing durable and disease-targeted therapeutics with the potential to transform treatment paradigms and provide unprecedented benefits to patients. We commenced operations in September 2013, have no products approved for commercial sale and have not generated any product revenue. Drug development is a highly uncertain undertaking and involves a substantial degree of risk. If our product candidates are not successfully developed and approved, we may never generate any product revenue. To date, we have not completed any clinical trials (including any pivotal clinical trial), obtained marketing approval for any product candidates, manufactured commercial scale quantities of any of our product candidates or arranged for a third party to do so on our behalf, or conducted sales and marketing activities necessary for successful product commercialization. Our limited operating history as a company and stage of drug development make any assessment of our future success and viability subject to significant uncertainty. We will encounter risks and difficulties frequently experienced by biopharmaceutical companies in rapidly evolving fields, and we have not yet demonstrated an ability to successfully overcome such risks and difficulties. If we do not address these risks and difficulties successfully, our business will be seriously harmed.

We have had recurring net losses, and we expect to continue to incur significant net losses for the foreseeable future.

We have incurred recurring net losses, including net losses of $140.1 million and $160.9 million for the years ended December 31, 2025 and 2024, respectively. As of December 31, 2025, we had an accumulated deficit of $716.3 million.

We have devoted substantially all of our financial resources and efforts on research and development activities. We do not expect to generate revenue from product sales for several years, if at all. We continue to incur significant research and development and other expenses related to our ongoing operations. The amount of our future net losses will depend, in part, on the level of our future expenditures and our ability to generate revenue. Moreover, our net losses may fluctuate significantly from quarter to quarter and year to year, such that a period-to-period comparison of our results of operations may not be a good indication of our future performance.

We expect to continue to incur significant expenses and operating losses for the foreseeable future. Our expenses may increase substantially if and as we:

- progress our current and any future product candidates through preclinical and clinical development;
- expand our manufacturing facilities and work with our contract manufacturers to scale up the manufacturing processes for our product candidates;
- continue our research and discovery activities;
- continue the development of our Therapeutic Vector Evolution platform;
- initiate and conduct additional preclinical, clinical or other studies for our product candidates;
- change or add additional contract manufacturers or suppliers;
- seek regulatory approvals and marketing authorizations for our product candidates;
- establish sales, marketing and distribution infrastructure to commercialize any products for which we obtain approval;
- acquire or in-license product candidates, intellectual property and technologies;
- make milestone, royalty or other payments due under any current or future collaboration or license agreements;
- obtain, maintain, expand, protect and enforce our intellectual property portfolio;
- attract, hire and retain qualified personnel;
- experience any delays or encounter other issues related to our operations;
- meet the requirements and demands of being a public company;
- are adversely impacted by general economic conditions, such as rising inflation, tariffs and increased interest rates;
- defend against any product liability claims or other lawsuits related to our products; and
- experience delays in our preclinical studies and clinical trials, whether current or planned, due to pandemics or public health emergencies.

Our prior losses and expected future losses have had and will continue to have an adverse effect on our stockholders' deficit and working capital. In any particular quarter or quarters, our operating results could be below the expectations of securities analysts or investors, which could cause our stock price to decline.

We will require substantial additional capital to finance our operations. If we are unable to raise such capital when needed, or on acceptable terms, we may be forced to delay, reduce and/or

eliminate one or more of our research and drug development programs or future commercialization efforts.

Developing biopharmaceutical products, including conducting preclinical studies and clinical trials, is a very time consuming, expensive and uncertain process that takes years to complete. Our operations have required substantial amounts of cash since inception. To date, we have financed our operations primarily through the sale of equity securities and to a lesser extent from cash received pursuant to our collaboration and license agreements. We have initiated clinical trials, which are ongoing, and have additional product candidates in preclinical development that may enter clinical development. Developing our product candidates is expensive, and we expect to continue to spend substantial amounts as we fund our early-stage research projects, continue preclinical and clinical development of our product candidates and, in particular, advance our product candidates through clinical trials. Even if we are successful in developing our product candidates, obtaining regulatory approvals and launching and commercializing any product candidate will require substantial funding.

As of December 31, 2025, we had $514.0 million in cash and cash equivalents and marketable securities.

Based on our current operating plan, we believe that our existing cash, cash equivalents and marketable securities will allow us to fund our planned operations for at least one year from the date of the issuance of the financial statements included in this report.

Additional funds may not be available when we need them, on terms that are acceptable to us, or at all. Our ability to raise additional capital may be adversely impacted by global economic conditions affecting credit and financial markets (including due to increased interest rates and high inflation rates) and product supply chains. 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 research and development activities or eliminate one or more of our development programs altogether; or
- delay, limit, reduce or terminate our efforts to establish manufacturing and sales and marketing capabilities or other activities that may be necessary to commercialize our product candidates, or reduce our flexibility in developing or maintaining our sales and marketing strategy.

We also could be required to seek funds through arrangements with collaborators or others that may require us to relinquish rights to, or jointly own some aspects of, our product candidates or technologies that we would otherwise pursue on our own. We do not expect to realize revenue from sales of products or royalties from licensed products in the foreseeable future, if at all, and unless and until a product candidate is clinically tested, approved for commercialization and successfully marketed.

We will be required to seek additional funding in the future and currently intend to do so through collaborations, public or private equity offerings or debt financings, credit or loan facilities or a combination of one or more of these funding sources. Our ability to raise additional funds will depend on financial, economic and other factors, many of which are beyond our control. Additional funds may not be available to us on acceptable terms or at all. If we raise additional funds by issuing equity securities, our stockholders will suffer dilution, and the terms of any financing may adversely affect the rights of our stockholders. In addition, as a condition to providing additional funds to us, future investors may demand, and may be granted, rights superior to those of existing stockholders. Debt financing, if available, is likely to involve restrictive covenants limiting our flexibility in conducting future business activities, and, in the event of insolvency, debt holders would be repaid before holders of our equity securities received any distribution of our corporate assets.

If we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we may have to significantly delay, scale back or discontinue the development or commercialization of one or

more of our product candidates or one or more of our other research and development initiatives. Any of the above events could seriously harm our business and cause the price of our common stock to decline.

Due to the significant resources required for the development of our product candidates, and depending on our ability to access capital, we must prioritize development of certain product candidates. Moreover, we may expend our limited resources on product candidates that do not yield a successful product and fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

Due to the significant resources required for the development of our product candidates, in particular our product candidates in IND-enabling studies and those in clinical trials, we must decide which product candidates and indications to pursue and advance and the amount of resources to allocate to each. Our decisions concerning the allocation of research, development, collaboration, management and financial resources toward particular product candidates or therapeutic areas may not lead to the development of any viable commercial product and may divert resources away from better opportunities. Similarly, our potential decisions to delay, terminate or collaborate with third parties in respect of certain product candidates may subsequently also prove to be less than optimal and could cause us to miss valuable opportunities. If we make incorrect determinations regarding the viability or market potential of any of our product candidates or misread trends in the biopharmaceutical industry, particularly in retina and pulmonology, our business could be seriously harmed. As a result, we may fail to capitalize on viable commercial products or profitable market opportunities, be required to forego or delay pursuit of opportunities with other product candidates or other diseases that may later prove to have greater commercial potential than those we choose to pursue, or relinquish valuable rights to such product candidates through collaboration, licensing or other royalty arrangements in cases in which it would have been advantageous for us to invest additional resources to retain sole development and commercialization rights.

The amount of our future losses is uncertain and our quarterly operating results may fluctuate significantly or may fall below the expectations of investors or securities analysts, each of which may cause our stock price to fluctuate or decline.

Our quarterly and annual operating results may fluctuate significantly, making it difficult for us to predict our future operating results. These fluctuations may occur due to a variety of factors, many of which are outside our control and may be difficult to predict, including:

- the timing and success or failure of preclinical studies and clinical trials for our product candidates or competing product candidates, or any other change in the competitive landscape of our industry, including consolidation among our competitors or collaboration partners;
- the timing, cost, and level of investment in research, development and commercialization activities, which may change from time to time;
- the timing of receipt of approvals from regulatory authorities in the United States and internationally;
- the timing and status of enrollment and safety and efficacy readouts for our clinical trials;
- the cost of manufacturing, as well as building out our supply chain, which may vary depending on the quantity of production, the cost of continuing to establish and scale up our manufacturing capabilities, and the terms of any agreements we enter into with third-party suppliers;
- the timing and amount of any option, milestone, royalty or other payments due under any current or future collaboration or license agreement;
- coverage and reimbursement policies with respect to our genetic medicine product candidates and potential future drugs that compete with our products, if approved;

- expenditures that we may incur to acquire, develop or commercialize additional products and technologies;
- the level of demand for our genetic medicine products, if approved, which may vary significantly over time;
- future accounting pronouncements or changes in our accounting policies; and
- the impact from general macroeconomic trends, such as higher inflation, tariffs and increased interest rates.

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

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

Risks Related to the Research, Discovery, Development and Commercialization of Our Product Candidates

All of our product candidates are based on a novel AAV genetic medicine technology with which there is limited regulatory and clinical experience to date, which makes it difficult to predict the time and cost of product candidate development and subsequently obtaining regulatory approval. Further, the regulatory approval process for novel product candidates such as ours can be more expensive and take longer than for other, better known or extensively studied therapeutic modalities.

All of our product candidates are based on genetic medicine technology, and our future success depends on the successful development of this novel therapeutic approach. We cannot assure you that any development problems we or other genetic medicine companies experience in the future related to genetic medicine technology will not cause significant delays or unanticipated costs in the development of our product candidates, or that such development problems can be solved. In addition, the clinical study requirements of the FDA and other regulatory agencies and the criteria these regulators use to determine the safety and efficacy of a product candidate vary substantially according to the type, complexity, novelty and intended use and market of the potential products. The regulatory approval process for novel product candidates such as ours can be more expensive and take longer than for other, better known or extensively studied therapeutic modalities. Further, as we are developing novel treatments for diseases in which there is limited clinical experience with new endpoints and methodologies, there is heightened risk that the FDA, EMA or comparable foreign regulatory bodies may not consider the clinical trial endpoints to provide clinically meaningful results, and the resulting clinical data and results may be more difficult to analyze. To date, few genetic medicine products have been approved by the FDA or comparable foreign regulatory authorities, which makes it difficult to determine how long it will take or how much it will cost to obtain regulatory approvals for our product candidates in the United States, the European Union (“EU”) or other jurisdictions. Further, approvals by one regulatory agency may not be indicative of what other regulatory agencies may require for approval.

Regulatory requirements governing genetic medicine products have evolved and may continue to change in the future. For example, the FDA has established the Office of Therapeutic Products within its Center for Biologics Evaluation and Research (“CBER”) to consolidate the review of genetic medicine and related products, and the Cellular, Tissue and Gene Therapies Advisory Committee to advise CBER on

its review. These and other regulatory review agencies, committees and advisory groups and the requirements and guidelines they promulgate may lengthen the regulatory review process, require us to perform additional preclinical studies or clinical trials, increase our development costs, lead to changes in regulatory positions and interpretations, delay or prevent approval and commercialization of these treatment candidates or lead to significant post-approval limitations or restrictions.

The National Institutes of Health ("NIH") Guidelines for Research Involving Recombinant DNA Molecules ("NIH Guidelines") require supervision of human gene transfer trials, including evaluation and assessment by an Institutional Biosafety Committee ("IBC"), a local institutional committee that reviews and oversees research utilizing recombinant or synthetic nucleic acid molecules at that institution. The IBC assesses the safety of the research and identifies any potential risk to public health or the environment, and such review may result in some delay before initiation of a clinical trial. While the NIH Guidelines are not mandatory unless the research in question is being conducted at or sponsored by institutions receiving NIH funding of recombinant or synthetic nucleic acid molecule research, many companies and other institutions not otherwise subject to the NIH Guidelines voluntarily follow them.

We are subject to significant regulatory oversight by the FDA, and, in addition, the applicable IBC and Institutional Review Board ("IRB"), of each institution at which we or our collaborators conduct clinical trials of our product candidates, or a central IRB if appropriate, need to review and approve the proposed clinical trial.

Similar requirements apply in the EU. The EMA has a Committee for Advanced Therapies ("CAT") that is responsible for assessing the quality, safety and efficacy of advanced therapy medicinal products, or ATMP(s). ATMPs include gene therapy medicines, somatic-cell therapy medicines and tissue-engineered medicines. The role of the CAT is to prepare a draft opinion on an application for marketing authorization for an ATMP candidate that is submitted to the EMA. In the EU, the development and evaluation of an ATMP must be considered in the context of the relevant EU guidelines. The EMA may issue new guidelines concerning the development and marketing authorization for gene therapy medicinal products and require that we comply with these new guidelines. Similarly complex regulatory environments exist in other jurisdictions.

Changes in applicable regulatory guidelines may lengthen the regulatory review process, require us to perform additional studies or trials, increase our development costs, lead to changes in regulatory positions and interpretations, delay or prevent approval and commercialization of our product candidates or lead to significant post-approval limitations or restrictions.

As we advance our product candidates, we will be required to consult with these regulatory and advisory groups and comply with applicable guidelines. If we fail to do so, we may be required to delay or discontinue development of such product candidates. These additional processes may result in a review and approval process that is longer than we otherwise would have expected. Delays as a result of an increased or lengthier regulatory approval process or further restrictions on the development of our product candidates can be costly and could negatively impact our ability to complete clinical trials and commercialize our current and future product candidates in a timely manner, if at all and could seriously harm our business.

Adverse public perception or regulatory scrutiny of genetic medicine technology may negatively impact the developmental progress or commercial success of product candidates that we develop alone or with collaborators.

The developmental and commercial success of our current product candidates, or any that we develop alone or with collaborators in the future, will depend in part on public acceptance of the use of genetic medicine technology, including the use of AAVs, for the prevention or treatment of human diseases. Adverse public perception of gene therapies may negatively impact our ability to raise capital or enter into strategic agreements for the development of product candidates.

Genetic medicine remains a novel technology. The commercial success of our genetic medicine product candidates, if successfully developed and approved, may be adversely affected by claims that genetic medicine is unsafe, unethical or immoral. This may lead to unfavorable public perception and the inability of any of our product candidates to gain the acceptance of the public or the medical community. Unfavorable public perceptions may also adversely impact our or our collaborators' ability to enroll clinical trials for our product candidates. Moreover, success in commercializing any product candidates that receive regulatory approval will depend upon physicians prescribing, and their patients being willing to receive, treatments that involve the use of such product candidates in lieu of, or in addition to, existing treatments with which they are already familiar and for which greater clinical data may be available.

Publicity of any adverse events in, or unfavorable results of, preclinical studies or clinical trials for any current or future product candidates, or with respect to the studies or trials of our competitors or of academic researchers utilizing similar technologies, even if not ultimately attributable to our technology or product candidates, could negatively influence public opinion. Negative public perception about the use of AAV technology in human therapeutics, whether related to our technology or a competitor's technology, could result in increased governmental regulation, delays in the development and commercialization of product candidates or decreased demand for the resulting products, any of which may seriously harm our business.

Our product candidates may cause undesirable side effects or have other properties that could halt their clinical development, prevent their regulatory approval, limit their commercial potential or result in significant negative consequences.

Adverse events or other undesirable side effects caused by our product candidates 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 other comparable foreign regulatory authorities.

During the conduct of clinical trials, patients report changes in their health, including illnesses, injuries, and discomforts, to their study doctor. Often, it is not possible to determine whether or not the product candidate being studied caused these conditions. It is possible that as we test our product candidates in larger, longer and more extensive clinical trials, or as use of these product candidates becomes more widespread if they receive regulatory approval, illnesses, injuries, discomforts and other adverse events that were observed in previous trials, as well as conditions that did not occur or went undetected in previous trials, will be reported by patients. Less common adverse effects may not become evident until investigational products are tested in large-scale, Phase 3 clinical trials or, in some cases, after they are made available to patients on a commercial scale after approval.

If any serious adverse events occur, clinical trials or commercial distribution of any product candidates or products we develop alone or with collaborators could be suspended or terminated, and our business could be seriously harmed. Treatment-related side effects could also affect patient recruitment and the ability of enrolled patients to complete the trial or result in potential liability claims. Regulatory authorities could order us or our collaborators to cease further development of, deny approval of, or require us to cease selling any product candidates or products for any or all targeted indications. If we or our collaborators elect, or are required, to delay, suspend or terminate any clinical trial or commercialization efforts, the commercial prospects of such product candidates or products may be harmed, and our ability to generate product revenue from them or other product candidates that we develop may be delayed or eliminated. Additionally, if one or more of our product candidates receives marketing approval, and we or others later identify undesirable side effects or adverse events caused by such products, a number of potentially significant negative consequences could result, including but not limited to:

- regulatory authorities may suspend, limit or withdraw approvals of such product, or seek an injunction against its manufacture or distribution;

- regulatory authorities may require additional warnings on the label including “boxed” warnings, or issue safety alerts, Dear Healthcare Provider letters, press releases or other communications containing warnings or other safety information about the product;
- we may be required to change the way the product is administered or conduct additional clinical trials or post-approval studies;
- we may be required to create a Risk Evaluation and Mitigation Strategy (“REMS”), which could include a medication guide outlining the risks of such side effects for distribution to patients, a communication plan for healthcare providers and/or other elements to assure safe use;
- the product may become less competitive;
- we may be subject to fines, injunctions or the imposition of criminal penalties;
- we could be sued and held liable for harm caused to patients; and
- our reputation may suffer.

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

Drug development is a highly uncertain undertaking and involves a substantial degree of risk. We have no products approved for commercial sale, and we have never generated any revenue from product sales, and we may never generate product revenue or be profitable.

We have no products approved for commercial sale and have not generated any revenue from product sales. We do not anticipate generating any revenue from product sales until after we have successfully completed clinical development and received regulatory approval for the commercial sale of a product candidate, which will not occur for several years, if ever.

Our ability to generate revenue and achieve profitability depends significantly on many factors, including:

- successfully completing research and preclinical and clinical development of our product candidates;
- obtaining regulatory approvals and marketing authorizations for product candidates for which we successfully complete clinical development and clinical trials;
- developing a sustainable and scalable manufacturing process for our product candidates, as well as establishing and maintaining commercially viable supply relationships with third parties that can provide adequate products and services to support clinical activities and any commercial demand for our product candidates;
- identifying, assessing, acquiring and/or developing new product candidates;
- negotiating favorable terms in any collaboration, licensing or other arrangements into which we may enter;
- the prevalence, duration and severity of potential side effects or other safety issues experienced with our product candidates or future approved products, if any;
- launching and successfully commercializing product candidates for which we obtain marketing approval, either by collaborating with a partner or, if launched independently, by establishing a sales, marketing and distribution infrastructure;
- obtaining and maintaining an adequate price for our product candidates, both in the United States and in foreign countries where our product candidates are commercialized;
- obtaining adequate reimbursement for our product candidates or procedures using our product candidates from payors;

- the convenience and durability of our treatment or dosing regimen;
- acceptance by physicians, payors and patients of the benefits, safety and efficacy of our product candidates, or any future product candidates, if approved, including relative to alternative and competing treatments;
- patient demand for any of our product candidates that may be approved;
- addressing any competing technological and market developments;
- the effects of any public health emergencies which may result in delays to patient enrollment, patients discontinuing their treatment or follow up visits or changes to trial protocols;
- maintaining, protecting, expanding and enforcing our portfolio of intellectual property rights, including patents, trade secrets and know-how; and
- attracting, hiring and retaining qualified personnel.

Because of the numerous risks and uncertainties associated with drug development, we are unable to predict the timing or amount of our expenses, or when we will be able to generate any meaningful revenue or achieve or maintain profitability, if ever. In addition, our expenses could increase beyond our current expectations if we are required by the FDA or foreign regulatory agencies to perform studies in addition to those that we currently anticipate, or if there are any delays in any of our or our collaborators' clinical trials or the development of any of our product candidates. Even if one or more of our product candidates are approved for commercial sale, we anticipate incurring significant costs associated with commercializing any approved product candidate and ongoing compliance efforts.

Even if we are able to generate revenue from the sale of any approved products, we may not become profitable, and we will need to obtain additional funding through one or more equity or debt financings in order to continue operations. Revenue from the sale of any product candidate for which regulatory approval is obtained will be dependent, in part, upon the size of the markets in the territories for which we gain regulatory approval, the accepted price for the product, the ability to get reimbursement at any price and whether we own the commercial rights for that territory. If the number of addressable patients is not as large as we anticipate, the indication approved by regulatory authorities is narrower than we expect, the reasonably accepted population for treatment is narrowed by competition, physician choice or treatment guidelines or the price and available third-party reimbursement are lower than anticipated, we may not generate significant revenue from sales of such product candidate, even if approved. Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis.

Our failure to become and remain profitable would decrease the value of our company and could impair our ability to raise capital, expand our business, maintain our research and development efforts, diversify our pipeline of product candidates or continue our operations and cause a decline in the value of our common stock, all or any of which may seriously harm our business.

We may encounter substantial delays in our clinical trials or may not be able to conduct or complete our clinical trials on the timelines we expect, if at all.

Clinical testing is expensive, time consuming, and subject to uncertainty. We cannot guarantee that any clinical trials will be initiated, conducted as planned or completed on schedule, if at all. We also cannot be sure that submission of an IND or a clinical trial application ("CTA") will result in the FDA or other regulatory authority, as applicable, allowing clinical trials to begin in a timely manner, if at all. Moreover, even if these trials begin, issues may arise that could delay, suspend or terminate such clinical trials. A failure of one or more clinical trials can occur at any stage of testing, and our future clinical trials may not be successful. In 2025, we initiated our wet AMD Phase 3 studies comparing a single dose of 4D-150 3E10 vg/eye to on-label aflibercept 2mg Q8 weeks. If we experience any delays in completing these trials, due to delays in enrollment or other factors, it could result in serious harm to our business. Events that may prevent successful or timely initiation or completion of clinical trials include:

- inability to generate sufficient preclinical, toxicology, or other in vivo or in vitro data to support the initiation or continuation of clinical trials;
- delays in reaching a consensus with regulatory agencies on study design or implementation of the clinical trials;
- delays or failure in obtaining regulatory authorization to commence a trial;
- delays in reaching agreement on acceptable terms with prospective contract research organizations ("CROs") and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and clinical trial sites;
- refusal of the FDA to accept data from clinical trials in geographies outside the United States;
- delays in identifying, recruiting and training suitable clinical investigators;
- delays in identifying, recruiting, and enrolling patients who meet the requirements of our clinical trials;
- delays in obtaining required IRB approval or ethics committee opinion at each clinical trial site;
- delays in manufacturing, testing, releasing, validating, or importing/exporting sufficient stable quantities of our product candidates for use in clinical trials or the inability to do any of the foregoing;
- insufficient or inadequate supply or quality of product candidates or other materials necessary for use in clinical trials, or delays in sufficiently developing, characterizing or controlling a manufacturing process suitable for clinical trials;
- imposition of a temporary or permanent clinical hold by regulatory agencies for a number of reasons, including after review of an IND or amendment, CTA or amendment, or equivalent foreign application or amendment; as a result of a new safety finding that presents unreasonable risk to clinical trial participants; or a negative finding from an inspection of our clinical trial operations or study sites;
- developments on trials conducted by competitors for related technology that raise FDA or foreign regulatory authority concerns about risk to patients of the technology broadly; or if the FDA or a foreign regulatory authority finds that the investigational protocol or plan is clearly deficient to meet its stated objectives;
- delays caused by patients withdrawing from clinical trials or failing to return for post-treatment follow-up;
- difficulty collaborating with patient groups and investigators;
- failure by our CROs, other third parties, or us to adhere to clinical trial protocols;
- failure to perform in accordance with the FDA's or any other regulatory authority's good clinical practice ("GCP") requirements or applicable regulatory guidelines in other countries;
- occurrence of adverse events associated with the product candidate that are viewed to outweigh its potential benefits;
- changes in regulatory requirements and guidance (including differing expectations across jurisdictions) that require amending or submitting new clinical protocols, expanding enrollment, modifying statistical assumptions (including non-inferiority margins), or submitting new or amended protocols, including for our Phase 3 trials of 4D-150;
- changes in the standard of care on which a clinical development plan was based, which may require new or additional trials;
- the cost of clinical trials of our product candidates being greater than we anticipate;

- clinical trials of our product candidates producing negative or inconclusive results, which may result in our deciding, or regulators requiring us, to conduct additional clinical trials or abandon development of such product candidates;
- transfer of manufacturing processes to larger-scale facilities operated by a CDMO or by us, and delays or failure by our CDMOs or us to make any necessary changes to such manufacturing process;
- third parties being unwilling or unable to satisfy their contractual obligations to us; and
- adverse public perception or regulatory scrutiny of genetic medicine technology may negatively impact the developmental progress or commercial success of products that we develop alone or with collaborators.

Patient enrollment, a determinative factor in the timing of clinical trials, is affected by many factors including the severity and difficulty of diagnosing the disease under investigation, knowledge of the disease in the medical community and availability of effective diagnostic methods, size and distribution of the patient population and process for identifying subjects, access of patients to medical professionals experienced in their disease, our ability to effectively disseminate information about our clinical trials to the patient population and access of patients to such information, eligibility and exclusion criteria for the trial in question, design of the trial protocol, availability, efficacy of, and our ability to compete with approved and standard of care therapies or other clinical trials for the disease or condition under investigation, perceived risks and benefits of the product candidate under trial or testing, availability of genetic testing for potential patients, efforts to facilitate timely enrollment in clinical trials, patient referral practices of physicians, ability to obtain and maintain subject consent, the risk that enrolled subjects will drop out before completion of the trial, the ability to monitor patients adequately during and after treatment, the time and financial commitments required of patients to enroll in our trials beyond the costs covered by the company, and the proximity and availability of and access to clinical trial sites for prospective patients. Furthermore, we rely on CROs and clinical trial sites to ensure the proper and timely conduct of our clinical trials, and while we have agreements governing their committed activities, we have limited influence over their actual performance.

Any inability to successfully initiate or complete clinical trials could result in additional costs to us or impair our ability to generate revenue. In addition, if we make manufacturing or formulation changes to our product candidates, we may be required, or we may elect to conduct additional studies to bridge our modified product candidates to earlier versions. Clinical trial delays could also shorten any periods during which our products have patent protection and may allow our competitors to bring products to market before we do, which could impair our ability to successfully commercialize our product candidates and may seriously harm our business.

We could also encounter delays if a clinical trial is suspended or terminated by us, by the data safety monitoring board for such trial or by the FDA or any other regulatory authority, or if the IRBs of the institutions in which such trials are being conducted suspend or terminate the participation of their clinical investigators and sites subject to their review. Such authorities may suspend or terminate a clinical trial due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by the FDA or other regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a product candidate, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial.

Delays in the completion of any clinical trial of our product candidates will increase our costs, slow down our product candidate development and approval process and delay or potentially jeopardize our ability to commence product sales and generate revenue. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of our product candidates and could seriously harm our business.

The limited number of patients who have the diseases for which many of our product candidates are being studied may make it more difficult for us to enroll or complete clinical trials or may result in findings in our clinical trials that do not reach levels of statistical significance sufficient for marketing approval.

Many of the conditions for which we plan to evaluate our current product candidates in clinical trials are rare genetic diseases. Accordingly, there are limited patient pools from which to draw for clinical trials. In addition to the rarity of these diseases, the eligibility criteria of our clinical trials will further limit the pool of available study participants as we will require that patients have specific characteristics that we can measure to assure their disease is either severe enough or not too advanced to include them in a trial. We or our collaborators may not be able to initiate or continue clinical trials on a timely basis or at all for any of our product candidates if we or our collaborators are unable to locate and enroll a sufficient number of eligible patients to participate in the trials as required by applicable regulations or as needed to provide appropriate statistical power for a given trial. Similarly, because many of the conditions we intend to treat are rare in nature, we plan to design and conduct clinical trials utilizing a small number of patients in order to evaluate the safety and therapeutic activity of our product candidates. Conducting trials in smaller subject populations increases the risk that any safety or efficacy issues observed in only a few patients could prevent such trials from reaching statistical significance or otherwise meeting their specified endpoints, which could require us to conduct additional clinical trials, or delay or prevent our product candidates from receiving regulatory approval, which would seriously harm our business.

Research and development of biopharmaceutical products is inherently risky. We cannot give any assurance that any of our product candidates will receive regulatory approval, which is necessary before they can be commercialized or if they will ever be successfully commercialized.

Aside from 4D-150, our product candidates are at an early stage of development. Our future success is dependent on our ability to successfully develop, obtain regulatory approval for, and then successfully commercialize our product candidates, and we may fail to do so for many reasons, including the following:

- our product candidates may not successfully complete preclinical studies or clinical trials;
- a product candidate may on further study be shown to have harmful side effects or other characteristics that indicate it does not meet applicable regulatory criteria;
- our competitors may develop therapeutics that render our product candidates obsolete or less attractive;
- our competitors may develop platform technologies that render our Therapeutic Vector Evolution platform technology obsolete or less attractive;
- the product candidates and Therapeutic Vector Evolution platform technology that we develop may not be sufficiently covered by intellectual property for which we hold exclusive rights or may be covered by third-party patents or other intellectual property or exclusive rights;
- the market for a product candidate may change so that the continued development of that product candidate is no longer reasonable or commercially attractive;
- a product candidate may not be capable of being produced in commercial quantities at an acceptable cost, or at all;
- if a product candidate obtains regulatory approval, we may be unable to establish sales and marketing capabilities, or successfully market such approved product candidate;
- delays in our clinical development plans due to public health emergencies; and
- a product candidate may not be accepted as safe and effective by patients, the medical community or third-party payors.

If any of these events occur, we or our collaborators may be forced to abandon our development efforts for a product candidate or candidates, which would seriously harm our business. Failure of a product candidate may occur at any stage of preclinical or clinical development, and, because most of our product candidates and our Therapeutic Vector Evolution platform technology are in an early stage of development, there is a relatively higher risk of failure, and we may never succeed in developing marketable products or generating product revenue.

We may not be successful in our efforts to further develop our Therapeutic Vector Evolution platform technology and current product candidates. We are not permitted to market or promote any of our product candidates before we receive regulatory approval from the FDA or comparable foreign regulatory authorities, and we may never receive such regulatory approval for any of our product candidates. Aside from 4D-150, each of our product candidates is in the early stages of development and will require significant additional clinical development, management of preclinical, clinical, and manufacturing activities, regulatory approval, adequate manufacturing supply, a commercial organization, and significant marketing efforts before we generate any revenue from product sales, if at all. Any clinical trials that we may conduct may not demonstrate the efficacy and safety necessary to obtain regulatory approval to market our product candidates. If the results of our ongoing or future clinical trials are inconclusive with respect to the efficacy of our product candidates or 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 or delayed in obtaining marketing approval for our product candidates.

If any of our product candidates successfully complete clinical trials, we generally plan to seek regulatory approval to market our product candidates in the United States, the EU, and in additional foreign countries where we believe there is a viable commercial opportunity. We have never commenced, compiled or submitted an application seeking regulatory approval to market any product candidate, which may impede our ability to secure approval and successfully launch our therapies. We may never receive regulatory approval to market any product candidates even if such product candidates successfully complete clinical trials, which would seriously harm our business. To obtain regulatory approval in countries outside the United States, we must comply with numerous and varying regulatory requirements of such other countries regarding safety, efficacy, purity, potency, chemistry, manufacturing and controls, clinical trials, commercial sales, pricing and distribution of our product candidates. We may also rely on our collaborators or collaboration partners to conduct the required activities to support an application for regulatory approval, and to seek approval, for one or more of our product candidates. We cannot be sure that our collaborators or collaboration partners will conduct these activities successfully or do so within the timeframe we desire. Even if we (or our collaborators or collaboration partners) are successful in obtaining approval in one jurisdiction, we cannot assure you that we will obtain approval in any other jurisdictions. Failure to obtain approval for our product candidates in multiple jurisdictions will seriously harm our business.

Even if we receive regulatory approval to market any of our product candidates, we cannot assure you that any such product candidate will be successfully commercialized, widely accepted in the marketplace or more effective than other commercially available alternatives. Any approval we may obtain could 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 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 REMS. The failure to obtain timely regulatory approval of product candidates, any product marketing limitations or a product withdrawal would seriously harm our business.

Investment in biopharmaceutical product development involves significant risk that any product candidate will fail to demonstrate adequate efficacy or an acceptable safety profile, gain regulatory approval, and become commercially viable. We cannot assure you that we will be able to successfully advance any of our product candidates through the development process or, if approved, successfully commercialize any of our product candidates.

Public health crises such as pandemics or similar outbreaks have affected and could continue to seriously and adversely affect our preclinical and clinical trials, business, financial condition and results of operations.

Public health crises, such as pandemics or similar outbreaks, could result in public health guidance measures, including in the locations of our offices, clinical trial sites, key vendors and partners. We expect that our clinical development program timelines could be negatively affected by such pandemics, any public health orders or measures implemented in response to such pandemics, or residual effects thereof, which could seriously harm our business.

Disruptions at the FDA and other government agencies caused by funding shortages, staffing limitations or policy changes could hinder their ability to hire, retain or deploy key leadership and other personnel, or otherwise prevent new or modified products from being developed, approved or commercialized in a timely manner or at all.

The ability of the FDA and foreign regulatory authorities to review and/or approve new products can be affected by a variety of factors, including government budget, personnel, and funding levels, statutory, regulatory, and policy changes, the FDA's and foreign regulatory authorities' ability to hire and retain key personnel and accept the payment of user fees, and other events that may otherwise affect the FDA's or foreign regulatory authorities' ability to perform routine functions. Average review times at the FDA and foreign regulatory authorities have fluctuated in recent years as a result. In addition, government funding of other government agencies that fund research and development activities is subject to the political process, which is inherently fluid and unpredictable. Disruptions at the FDA and other agencies may also slow the time necessary for new drugs and biologics to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, over the last several years, the U.S. government has shut down several times and certain regulatory agencies, such as the FDA, have had to furlough critical FDA employees and stop critical activities. In addition, the current U.S. Presidential administration has issued certain policies and Executive Orders directed towards reducing the employee headcount and costs associated with U.S. administrative agencies, including the FDA, and it remains unclear the degree to which these efforts may limit or otherwise adversely affect the FDA's ability to conduct routine activities.

Separately, in response to the novel coronavirus pandemic, the FDA postponed most inspections of domestic and foreign manufacturing facilities at various points. If a prolonged government shutdown occurs, or if renewed global health concerns, funding shortages or staffing limitations prevent the FDA or other regulatory authorities from conducting their regular inspections, reviews, or other regulatory activities, it could significantly impact the ability of the FDA or such other regulatory authorities to timely review and process our regulatory submissions, which could seriously harm our business.

Our clinical trials may fail to demonstrate substantial evidence of the safety and efficacy of our product candidates, which would prevent, delay or limit the scope of regulatory approval and commercialization, which could seriously harm our business.

Before obtaining regulatory approvals for the commercial sale of any of our product candidates, we or our collaborators must demonstrate through lengthy, complex and expensive preclinical studies and clinical trials that our product candidates are both safe and effective for use in each target indication. Further, because our product candidates are subject to regulation as biological drug products, we will need to demonstrate that they are safe, pure, and potent for use in their target indications. Each product candidate must demonstrate an adequate risk versus benefit profile in its intended patient population and for its intended use.

Clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the clinical trial process. The results of preclinical studies of our product candidates may not be predictive of the results of early-stage or later-stage clinical trials, and results of early clinical trials of our product candidates may not be predictive of the results of later-stage clinical trials. The results of clinical trials in one set of patients or disease indications may not be

predictive of those obtained in another. In some instances, 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. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy profile despite having progressed through preclinical studies and initial clinical trials. A number of companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical trials due to lack of efficacy or unacceptable safety issues, notwithstanding promising results in earlier trials. Most product candidates that begin clinical trials are never approved by regulatory authorities for commercialization.

We have limited experience in designing clinical trials and may be unable to design and execute a clinical trial to support marketing approval. We cannot be certain that our ongoing and planned clinical trials or any other future clinical trials will be successful. Additionally, any safety concerns observed in any one of our clinical trials in our targeted indications could limit the prospects for regulatory approval of our product candidates in those and other indications, which could seriously harm our business.

Further, even if such clinical trials are successfully completed, we cannot assure you that the FDA or foreign regulatory authorities will interpret the results as we do, and more trials could be required before we submit our product candidates for approval. To the extent that the results of the trials are not satisfactory to the FDA or foreign regulatory authorities for support of a marketing application, we may be required to expend significant additional resources, which may not be available to us, to conduct additional trials in support of potential approval of our product candidates. Even if regulatory approval is secured for any of our product candidates, the terms of such approval may limit the scope and use of our product candidate, which may also limit its commercial potential.

In addition, the FDA's and other regulatory authorities' policies with respect to clinical trials may change and additional government regulations may be enacted. For instance, the regulatory landscape related to clinical trials in the EU recently evolved. The EU Clinical Trials Regulation ("CTR"), which was adopted in April 2014 and repeals the EU Clinical Trials Directive, became applicable on January 31, 2022. While the EU Clinical Trials Directive required a separate CTA to be submitted in each member state in which the clinical trial takes place, to both the competent national health authority and an independent ethics committee, the CTR introduces a centralized process and only requires the submission of a single application for multi-center trials. The CTR allows sponsors to make a single submission to both the competent authority and an ethics committee in each member state, leading to a single decision per member state. The assessment procedure of the CTA has been harmonized as well, including a joint assessment by all member states concerned, and a separate assessment by each member state with respect to specific requirements related to its own territory, including ethics rules. Each member state's decision is communicated to the sponsor via the centralized EU portal. Once the CTA is approved, clinical study development may proceed. 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 EU 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 EU 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. Compliance with the CTR requirements by us and our third-party service providers, such as CROs, may impact our development plans in the EU.

Interim, "top-line" and preliminary data from studies or trials that we announce or publish from time to time may change as more 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 publicly disclose top-line or preliminary data from preclinical studies and clinical trials, which are based on a preliminary analysis of then-available data, and the results and related findings and conclusions are subject to change following a more comprehensive review of the data related to the particular study or trial. We also make assumptions, estimations, calculations and

conclusions as part of our analyses of data, and we may not have received or had the opportunity to fully and carefully evaluate all data. As a result, the top-line or preliminary results that we report may differ from future results of the same studies, or different conclusions or considerations may qualify such results, once additional data have been received and fully evaluated. 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 data we previously published. As a result, top-line and preliminary data should be viewed with caution until the final data are available.

From time to time, we also disclose interim data from our preclinical studies and clinical trials. Interim data from clinical trials that we may complete 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. Adverse differences between preliminary, top-line or interim data and final data could seriously harm our business.

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

We may not be successful in our efforts to continue to create a pipeline of product candidates or to develop commercially successful products. If we fail to successfully identify and develop additional product candidates, our commercial opportunity may be limited, which could seriously harm our business.

One of our strategies is to identify and pursue preclinical and clinical development and commercialization of additional product candidates through our Therapeutic Vector Evolution platform technology. Our Therapeutic Vector Evolution platform technology may not produce a pipeline of viable product candidates, or our competitors may develop platform technologies that render our Therapeutic Vector Evolution platform technology obsolete or less attractive. Our research methodology may be unsuccessful in identifying potential product candidates or our potential product candidates may be shown to have harmful side effects or may have other characteristics that may make them unmarketable or unlikely to receive marketing approval. Identifying, developing and obtaining regulatory approval and commercializing additional product candidates will require substantial funding and is prone to the risks of failure inherent in drug development. If we are unable to successfully identify, acquire, develop and commercialize additional product candidates, our commercial opportunity may be limited, which could seriously harm our business.

We face substantial competition, which may result in others discovering, developing or commercializing products before or more successfully than we do.

The development and commercialization of new drug products is highly competitive. We may face competition with respect to any product candidates that we seek to develop or commercialize in the future from major pharmaceutical companies and biotechnology companies worldwide. Potential competitors also include academic institutions, government agencies, and other public and private research organizations that conduct research, seek patent protection, and establish collaborative arrangements for research, development, manufacturing, and commercialization.

There are a number of large pharmaceutical and biotechnology companies that are currently pursuing the development of products for the treatment of the indications for which we have product candidates, including wet AMD, DME, GA and cystic fibrosis. Certain of our competitors have commercially approved products for the treatment of the diseases that we are pursuing or may pursue in the future, including Apellis Pharmaceuticals Inc., Astellas Pharma Inc., Regeneron Pharmaceuticals Inc., Roche and Vertex Pharmaceuticals Incorporated. These drugs are well established therapies and are widely accepted by physicians, patients and third-party payors, which may make it difficult to convince these parties to switch to our product candidates. Companies that we are aware are developing therapeutics in the retina and pulmonology disease areas include large companies with significant financial resources, such as AbbVie Inc, Astellas Pharma Inc., Eli Lilly and Company, Johnson & Johnson, Merck & Company Inc., Regeneron Pharmaceuticals Inc., Roche, Sanofi and Vertex Pharmaceuticals Incorporated, and biopharmaceutical companies such as Apellis Pharmaceuticals Inc., Arcturus Therapeutics Holdings Inc., EyePoint Inc., Kodiak Sciences Inc., Krystal Biotech Inc., Ocular Therapeutix Inc., Recode Therapeutics Inc., REGENXBIO Inc. and Sionna Therapeutics Inc. In addition to competition from other companies targeting retina and pulmonology, any products we may develop may also face competition from other types of therapies, such as gene-editing therapies and drug delivery devices.

Many of our current or potential competitors, either alone or with their strategic partners, have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals, and marketing approved products than we do. Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our product candidates. Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient, or are less expensive than any products that we may develop. Furthermore, currently approved products could be discovered to have application for treatment of retina and pulmonology indications, which could give such products significant regulatory and market timing advantages over any of our product candidates. Our competitors also may obtain FDA, EMA or other regulatory approval for their products more rapidly than we may obtain approval for ours. Additionally, products or technologies developed by our competitors may render our potential product candidates uneconomical or obsolete, and we may not be successful in marketing against competitors any product candidates we may develop.

If, in the future, we are unable to establish sales and marketing capabilities or enter into agreements with third parties to sell and market any product candidates we may develop, we may not be successful in commercializing those 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 pharmaceutical products. To achieve commercial success for any approved product for which we retain sales and marketing responsibilities, we must either develop a sales and marketing organization or outsource these functions to third parties. In the future, we may choose to build a focused sales, marketing and commercial support infrastructure to sell, or participate in sales activities with our collaborators for some of our product candidates if and when they are approved.

There are risks involved with both establishing our own commercial capabilities and entering into arrangements with third parties to perform these services. For example, recruiting and training a sales force or reimbursement specialists 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 and other commercialization 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 commercialization personnel.

Factors that may inhibit our efforts to commercialize any approved product on our own include:

- our inability to recruit and retain adequate numbers of effective sales, marketing, reimbursement, compliance, customer service, medical affairs and other support personnel;
- our inability to recruit and build a commercial infrastructure;
- the inability of sales personnel to obtain access to physicians or persuade adequate numbers of physicians to prescribe any future approved products;
- the inability of reimbursement professionals to negotiate arrangements for formulary access, reimbursement, and other acceptance by payors;
- the inability to price our products at a sufficient price point to ensure an adequate and attractive level of profitability;
- restricted or closed distribution channels that make it difficult to distribute our products to segments of the patient population;
- 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 commercialization organization.

If we enter into arrangements with third parties to perform sales, marketing, commercial support and distribution services, our product revenue or the profitability of product revenue may be lower than if we were to market and sell any products we may develop ourselves. In addition, we may not be successful in entering into arrangements with third parties to commercialize our product candidates or may be unable to do so on terms that are favorable to us. We may have little control over such third parties, and any of them may fail to devote the necessary resources and attention to sell and market our products effectively. If we do not establish commercialization capabilities successfully, either on our own or in collaboration with third parties, we will not be successful in commercializing our product candidates if approved and our business would be seriously harmed.

Even if any product candidates we develop receive marketing approval, they may fail to achieve the degree of market acceptance by physicians, patients, healthcare payors and others in the medical community necessary for commercial success.

The commercial success of any of our product candidates will depend upon its degree of market acceptance by physicians, patients, third-party payors and others in the medical community. Even if any product candidates we may develop receive marketing approval, they may nonetheless fail to gain sufficient market acceptance by physicians, patients, third-party payors and others in the medical community. The degree of market acceptance of any product candidates we may develop, if approved for commercial sale, will depend on a number of factors, including:

- the efficacy and safety of such product candidates as demonstrated in pivotal clinical trials and published in peer-reviewed journals;
- the potential and perceived advantages compared to alternative treatments;
- the ability to offer our products for sale at competitive prices;
- the ability to offer appropriate patient access programs, such as co-pay assistance;
- sufficient third-party coverage or reimbursement;
- the extent to which physicians recommend our products to their patients;
- convenience and ease of dosing and administration compared to alternative treatments;

- the clinical indications for which the product candidate is approved by FDA, EMA or other regulatory agencies;
- product labeling or product insert requirements of the FDA, EMA or other comparable foreign regulatory authorities, including any limitations, contraindications or warnings contained in a product's approved labeling;
- restrictions on how the product is distributed;
- the timing of market introduction of competitive products;
- publicity concerning our products or competing products and treatments;
- the strength of marketing and distribution support; and
- the prevalence and severity of any side effects.

If any product candidates we develop do not achieve an adequate level of acceptance, we may not generate significant product revenue, and we may not become profitable and our business could be seriously harmed.

Risks Related to Manufacturing

Gene therapies are novel, complex and difficult to manufacture. We could experience production problems that result in delays in our development or commercialization programs, limit the supply of our products or otherwise seriously harm our business.

We currently manufacture and test clinical trial material for our products both internally at our cGMP facility, and externally at our partner CDMOs. Our product candidates require processing steps that are more complex than those required for most chemical and protein pharmaceuticals. Moreover, unlike chemical pharmaceuticals, the physical and chemical properties of a biologic such as ours generally cannot be fully characterized. As a result, assays of the finished product may not be sufficient to ensure that the product will perform in the intended manner. Accordingly, we employ multiple steps to control our manufacturing process to assure that the process works and the product candidate is made strictly and consistently in compliance with the process. Problems with the manufacturing process, even minor deviations from the normal process, could result in product defects or manufacturing failures that result in lot failures, product recalls, product liability claims or insufficient inventory, which could delay or prevent the initiation of clinical trials or receipt of regulatory approvals. We may encounter problems achieving adequate quantities and quality of clinical-grade materials that meet FDA, or other comparable applicable foreign standards or specifications with consistent and acceptable production yields and costs.

In addition, FDA and other comparable foreign regulatory authorities may require us to submit samples of any lot of any approved product together with the protocols showing the results of applicable tests at any time. Under some circumstances, the FDA or other comparable foreign regulatory authorities may require that we not distribute a lot until the agency authorizes its release. Slight deviations in the manufacturing process, including those affecting quality attributes and stability, may result in unacceptable changes in the product that could result in lot failures or product recalls. Lot failures or product recalls could cause us to delay clinical trials or product launches which could be costly to us and otherwise seriously harm our business.

We also may encounter problems hiring and retaining the experienced scientific, quality control and manufacturing personnel needed to operate our manufacturing process which could result in delays in our production or difficulties in maintaining compliance with applicable regulatory requirements.

Any problems in our manufacturing process or the facilities with which we contract could make us a less attractive collaborator for potential partners, including larger pharmaceutical companies, which could limit our access to additional attractive development programs. Problems in manufacturing processes or facilities also could restrict our ability to meet market demand for our products. Additionally,

should our supply needs exceed our internal capabilities and supply agreements with other parties with whom we have manufacturing agreements be terminated for any reason, there are a limited number of manufacturers who would be suitable replacements, and it would take a significant amount of time to transition the manufacturing to an alternative manufacturing organization.

Delays in obtaining regulatory approval of our manufacturing process or disruptions in our manufacturing process may delay or disrupt our commercialization efforts.

Before we can begin to commercially manufacture our product candidates in third-party or our own facilities, we must obtain regulatory approval from the FDA to market our product using the manufacturing process and facility we proposed in our marketing application. In addition, we must successfully complete a pre-approval inspection of our manufacturing facility by the FDA before any of our product candidates can obtain marketing approval, if ever. In order to obtain approval of a BLA for our product candidates, we will need to ensure that all of our manufacturing processes, methods and equipment are compliant with cGMP, and perform extensive audits of vendors, contract laboratories and suppliers. If any of our vendors, contract laboratories or suppliers is found to be out of compliance with cGMP, we may experience delays or disruptions in manufacturing while we work with these third parties to remedy the violation or while we work to identify suitable replacement vendors. The cGMP requirements govern quality control of the manufacturing process and documentation policies and procedures. In complying with cGMP, we will be obligated to expend time, money and effort in production, record keeping and quality control to assure that the product meets applicable specifications and other requirements. If we fail to comply with these requirements, we would be subject to possible regulatory action and may not be permitted to sell any products that we may develop. Similar risks may exist in foreign jurisdictions.

Delays in developing our manufacturing capabilities or failure to achieve operating efficiencies from it may require us to devote additional resources and management time to manufacturing operations and may delay our product development timelines.

We have approximately 17,000 square feet of laboratory and manufacturing space at our headquarters in Emeryville, California, a large portion of which we plan to devote to manufacturing activities for our clinical trials under cGMP. We may face delays in the production of clinical supply at our manufacturing facility and cannot guarantee when our facility will be able to produce sufficient quantities of product candidates needed to support our planned clinical trials. Any delays in developing our internal manufacturing capabilities may disrupt or delay the supply of our product candidates if we have not maintained a sufficient back-up supply of such product candidates through third-party manufacturers. Moreover, changing manufacturing facilities during the clinical development process may also require that we or our collaborators conduct additional studies, make notifications to regulatory authorities, make additional filings to regulatory authorities, and obtain regulatory authority approval for the new facilities, which may be delayed or which we may never receive. We will further need to comply with the FDA's and applicable foreign regulatory authorities' cGMP requirements for the production of product candidates for clinical trials and, if approved, commercial supply, and will be subject to FDA and comparable foreign regulatory authority inspection. These requirements include the qualification and validation of our manufacturing equipment and processes. We may not be able to develop or acquire the internal expertise and resources necessary for compliance with these requirements.

In order to develop internal manufacturing expertise, we may be forced to devote greater resources and management time than anticipated, particularly in areas relating to operations, quality, regulatory, facilities and information technology. We also may encounter problems hiring and retaining the experienced scientific, quality control and manufacturing personnel needed to operate our manufacturing processes. If we experience unanticipated employee shortage or turnover in any of these areas, we may not be able to effectively manage our ongoing manufacturing operations and we may not achieve the operating efficiencies that we anticipate from developing these capabilities, which may negatively affect our product development timeline or result in difficulties in maintaining compliance with applicable regulatory requirements. Any such problems could result in the delay, prevention or impairment of clinical development and commercialization of our product candidates and would seriously harm our business.

We currently rely and expect to continue to rely on third parties to conduct product manufacturing for certain of our product candidates, and these third parties may not perform satisfactorily.

We currently rely, and expect to continue to rely, on third parties for the production of some of our planned clinical trial drugs and commercial drug materials and, therefore, we can control only certain aspects of their activities. The facilities used by our contract manufacturers to manufacture certain of our product candidates must be reviewed by the FDA pursuant to inspections that will be conducted after we submit a BLA to the FDA. We do not control the manufacturing process of, and are completely dependent on, our contract manufacturing partners for compliance with the cGMP or similar foreign requirements for manufacture of our products. If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or others, we will not be able to obtain and/or maintain regulatory approval for our products as manufactured at their manufacturing facilities. Further, our CDMOs may use different facilities to manufacture our product candidate(s), and we and our CDMOs will be required to meet certain regulatory conditions, such as establishing comparability between the product candidates manufactured at each facility. Our failure, or failure by our CDMOs, to demonstrate sufficient comparability between a product candidate manufactured at different facilities may cause a delay in using a manufacturing facility for production, extend our clinical trial timelines and adversely impact our regulatory approval process. In addition, we have no control over the ability of our contract manufacturers to maintain adequate quality control, quality assurance and qualified personnel. If the FDA or a comparable foreign regulatory authority does not approve these facilities for the manufacture of our product candidates or if it withdraws any such approval in the future, we may need to find alternative manufacturing facilities, which would significantly impact our ability to develop, obtain regulatory approval for or market our product candidates, if approved.

In addition, we rely on additional third parties to manufacture plasmids used in the manufacture of our product candidates and to perform quality testing, and reliance on these third parties entails risks to which we would not be subject if we manufactured the plasmids ourselves, including:

- reduced control over certain aspects of manufacturing activities;
- termination or nonrenewal of manufacturing and service agreements with third parties in a manner or at a time that is costly or damaging to us; and
- disruptions to the operations of our third-party manufacturers and service providers caused by conditions unrelated to our business or operations, including the bankruptcy of the manufacturer or service provider.

Any of these events could lead to clinical trial delays or failure to obtain regulatory approval, or impact our ability to successfully commercialize future product candidates. Some of these events could be the basis for FDA or EU member state competent authority action, including injunction, recall, seizure or total or partial suspension of product manufacture.

Any contamination in our manufacturing process, shortages of raw materials or failure of any of our key suppliers to deliver necessary components could result in delays in our research studies, preclinical, and clinical development or marketing schedules.

Given the nature of biologics manufacturing, there is a risk of contamination during manufacturing. Any contamination could materially harm our ability to produce product candidates on schedule and could harm our results of operations and cause reputational damage.

Some of the raw materials required in our manufacturing process, such as plasmids, are derived from biologic sources. Such raw materials are difficult to procure and may be subject to contamination or recall. A material shortage, contamination, recall or restriction on the use of biologically derived substances in the manufacture of our product candidates could adversely impact or disrupt the commercial manufacturing or the production of clinical material, which could seriously harm our business.

We depend on third-party suppliers for key raw materials used in our manufacturing processes, and the loss of these third-party suppliers or their inability to supply us with adequate raw materials could seriously harm our business.

We rely on third-party suppliers for the raw materials required for the production of our product candidates. Third-party suppliers could increase their prices or be unable to supply us with adequate raw materials, on a timely basis or at all, for a variety of reasons, including potential restrictions on trade or tariffs. Our dependence on these third-party suppliers and the challenges we may face in obtaining adequate supplies of raw materials involve several risks, including limited control over pricing, availability, quality and delivery schedules. As a small company, our negotiation leverage is limited, and we are likely to get lower priority than our competitors who are larger than we are. We cannot be certain that our suppliers will continue to provide us with the quantities of these raw materials that we require or satisfy our anticipated specifications and quality requirements. Any interruption in supply of raw materials could materially harm our ability to manufacture our product candidates until a new source of supply, if any, could be identified and qualified. We may be unable to find a sufficient alternative supplier in a reasonable time or on commercially reasonable terms. Any performance failure on the part of our suppliers could delay the development and potential commercialization of our product candidates, including limiting supplies necessary for clinical trials and regulatory approvals, which would seriously harm our business.

Risks Related to Regulatory Approval and Other Legal Compliance Matters

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

We and any collaborators are not permitted to commercialize, market, promote or sell any product candidate in the United States without obtaining marketing approval from the FDA. Foreign regulatory authorities impose similar requirements. The time required to obtain approval by the FDA and comparable foreign regulatory authorities is unpredictable, typically takes many years following the commencement of clinical trials and depends upon numerous factors, including the type, complexity and novelty of the product candidates involved. In addition, approval policies, regulations or the type and amount of clinical data necessary to gain approval may change during the course of a product candidate's clinical development and may vary among jurisdictions, which may cause delays in the approval or the decision not to approve an application. Regulatory authorities have substantial discretion in the approval process and may refuse to accept any application or may decide that our data are insufficient for approval and require additional preclinical, clinical or other studies. We have not submitted for or obtained regulatory approval for any product candidate. We and any collaborators must complete additional preclinical or nonclinical studies and clinical trials to demonstrate the safety and efficacy of our product candidates in humans to the satisfaction of the regulatory authorities before we will be able to obtain these approvals, and it is possible that none of our existing product candidates or any product candidates we may seek to develop in the future will ever obtain regulatory approval.

Applications for our product candidates could fail to receive regulatory approval for many reasons, including but not limited to the following:

- the FDA or comparable foreign regulatory authorities may disagree with the design, implementation or results of our or our collaborators' clinical trials;
- the FDA or comparable foreign 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 of our products;
- the population studied in the clinical program may not be sufficiently broad or representative to assure efficacy and safety in the full population for which we seek approval;

- we or our collaborators may be unable to demonstrate to the FDA, or comparable foreign regulatory authorities that a product candidate's clinical and other benefits outweigh its safety risks;
- the FDA or comparable foreign regulatory authorities may disagree with our or our collaborators' interpretation of data from preclinical studies or clinical trials;
- the data collected from clinical trials of our product candidates may not be sufficient to support the submission of a BLA or other submission or to obtain regulatory approval in the United States or elsewhere;
- the FDA or comparable foreign regulatory authorities may fail to approve the manufacturing processes, test procedures and specifications, or facilities of third-party manufacturers with which we contract for clinical and commercial supplies; and
- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change in a manner rendering our or our collaborators' clinical data insufficient for approval.

This lengthy approval process, as well as the unpredictability of the results of clinical trials, may result in our failing to obtain regulatory approval to market any of our product candidates, which would seriously harm our business.

In addition, even if we or our collaborators were to obtain approval, regulatory authorities may approve any of our product candidates for fewer or more limited indications than we request, may impose significant limitations in the form of narrow indications, warnings, or a REMS. Regulatory authorities or other authorities responsible for pricing negotiations may not approve the price we or our collaborators intend to charge for products we may develop, may grant approval contingent on the performance of costly post-marketing clinical trials, or may approve a product candidate with a label that does not include the labeling claims necessary or desirable for the successful commercialization of that product candidate. Any of the foregoing scenarios could seriously harm our business.

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

We may in the future seek an accelerated approval for one or more of our product candidates. Under the accelerated approval program, the FDA may grant accelerated approval to a product candidate designed to treat a serious or life-threatening condition that provides meaningful therapeutic benefit over available therapies upon a determination that the product candidate has an effect on a surrogate endpoint or intermediate clinical endpoint that is reasonably likely to predict clinical benefit. The FDA considers a clinical benefit to be a positive therapeutic effect that is clinically meaningful in the context of a given disease, such as irreversible morbidity or mortality. For the purposes of accelerated approval, a surrogate endpoint is a marker, such as a laboratory measurement, radiographic image, physical sign, or other measure that is thought to predict clinical benefit but is not itself a measure of clinical benefit. An intermediate clinical endpoint is a clinical endpoint that can be measured earlier than an effect on irreversible morbidity or mortality that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit. The accelerated approval pathway may be used in cases in which the advantage of a new drug over available therapy may not be a direct therapeutic advantage but is a clinically important improvement from a patient and public health perspective. If granted, accelerated approval is usually contingent on the sponsor's agreement to conduct, in a diligent manner, confirmatory studies to verify and describe the drug's clinical benefit. If such confirmatory studies fail to confirm the drug's clinical benefit, or if the sponsor fails to conduct required confirmatory studies in a timely manner,

the FDA may withdraw its approval of the drug on an expedited basis. In addition, in December 2022, the Food and Drug Omnibus Reform Act of 2022 provided FDA additional statutory authority to mitigate potential risks to patients from continued marketing of ineffective drugs previously granted accelerated approval. Under these provisions, the FDA may require a sponsor of a product seeking accelerated approval to have a confirmatory trial underway prior to such approval being granted.

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

Even if we or our collaborators obtain regulatory approval for a product candidate, our products will remain subject to regulatory scrutiny.

If one of our product candidates is approved, it will be subject to ongoing regulatory requirements for manufacturing, labeling, packaging, storage, advertising, promotion, sampling, record-keeping, conduct of post-marketing studies, and submission of safety, efficacy, and other post- market information, including both federal and state requirements in the United States and requirements of comparable foreign regulatory authorities.

Manufacturers and manufacturers' facilities are required to comply with extensive FDA and comparable foreign regulatory authority requirements, including ensuring that quality control and manufacturing procedures conform to cGMP regulations or similar foreign requirements. As such, we and our contract manufacturers will be subject to continual review and inspections to assess compliance with cGMP or similar foreign requirements and adherence to commitments made in any approved marketing application. Accordingly, we and others with whom we work must continue to expend time, money and effort in all areas of regulatory compliance, including manufacturing, production, and quality control.

We will have to comply with requirements concerning advertising and promotion for our products. Promotional communications with respect to prescription drugs and biologics are subject to a variety of legal and regulatory restrictions and must be consistent with the information in the product's approved label. As such, we may not promote our products "off-label" for indications or uses for which they do not have approval, though we may share truthful and not misleading information that is otherwise consistent with our product's approved labeling. The holder of an approved application must submit new or supplemental applications and obtain approval for certain changes to the approved product, product labeling, or manufacturing process. We could also be asked to conduct post-marketing clinical studies to verify the safety and efficacy of our products in general or in specific patient subsets. An unsuccessful post-marketing study or failure to complete such a study could result in the withdrawal of marketing approval or label restrictions.

If a regulatory agency discovers previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, or disagrees with the promotion, marketing or labeling of a product, such regulatory agency may impose restrictions on that product or us, including requiring withdrawal of the product from the market. If we fail to comply with applicable regulatory requirements, a regulatory agency or enforcement authority may, among other things:

- issue warning letters;

- impose civil or criminal penalties;
- suspend or withdraw regulatory approval;
- suspend any of our clinical trials;
- refuse to approve pending applications or supplements to approved applications submitted by us;
- impose restrictions on our operations, including closing our manufacturing facility or our contract manufacturers' facilities; or
- seize or detain products, or require a product recall.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response and could generate negative publicity. Any failure to comply with ongoing regulatory requirements may adversely affect our ability to commercialize and generate revenue from our products. If regulatory sanctions are applied or if regulatory approval is withdrawn, our business will be seriously harmed.

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

We have received orphan drug designation for 4D-710 for cystic fibrosis, and we may seek orphan drug designation for certain future product candidates. However, we may be unable to obtain such designations or to maintain the benefits associated with orphan drug designation, including market exclusivity, which may cause our revenue, if any, to be reduced.

We have received orphan drug designation in the United States for 4D-710 for the treatment of cystic fibrosis. Although we may seek orphan product designation for some or all of our other product candidates, we may never receive such designations. Under the Orphan Drug Act, the FDA may designate a drug or biologic product as an orphan drug if it is intended to treat a rare disease or condition, defined as a patient population of fewer than 200,000 in the United States, or a patient population greater than 200,000 in the United States where there is no reasonable expectation that the cost of developing the drug will be recovered from sales in the United States. Orphan drug designation must be requested before submitting a BLA. Orphan designation is granted by the European Commission ("EC") based on a scientific opinion of the EMA's Committee for Orphan Medicinal Products ("COMP"). A medicinal product may be designated as orphan if its sponsor can establish that (i) the product is intended for the diagnosis, prevention, or treatment of a life-threatening or chronically debilitating condition; (ii) either (a) such condition affects no more than five in 10,000 persons in the EU when the application is made, or (b) the product, without the benefits derived from orphan status, would not generate sufficient return in the EU to justify investment; and (iii) there exists no satisfactory method of diagnosis, prevention or treatment of such condition authorized for marketing in the EU, or if such a method exists, the medicinal product will be of significant benefit to those affected by the condition. The application for orphan designation must be submitted before the application for marketing authorization.

In the United States, orphan drug designation entitles a party to financial incentives such as opportunities for grant funding towards clinical trial costs, tax advantages, and application fee waivers. After the FDA grants orphan drug designation, the generic identity of the drug and its potential orphan use are disclosed publicly by the FDA.

In addition, if a product receives the first FDA approval for the disease or condition for which it has orphan designation, the product is entitled to orphan drug exclusivity, which means the FDA may not

approve any other application to market the same drug for the same approved use or indication within such rare disease or condition for a period of seven years, except in limited circumstances, such as a showing of clinical superiority over the product with orphan exclusivity or where the manufacturer is unable to assure sufficient product quantity for the orphan patient population. Exclusive marketing rights in the United States may also be unavailable if we or our collaborators seek approval for a disease or condition broader than the orphan designated disease or condition and may be lost if the FDA later determines that the request for designation was materially defective. In the EU, orphan designation entitles a party to financial incentives such as reduction of fees, fee waivers, protocol assistance, and access to the centralized marketing authorization procedure. Moreover, upon grant of a marketing authorization and assuming the requirement for orphan designation are also met at the time the marketing authorization is granted, orphan medicinal products are entitled to a ten-year period of market exclusivity for the approved therapeutic indication. The period of market exclusivity is extended by two years for orphan medicinal products that have also complied with an agreed Pediatric Investigation Plan ("PIP"). The European exclusivity period can be reduced to six years, if, at the end of the fifth year a medicine no longer meets the criteria for orphan designation (i.e. the prevalence of the condition has increased above the orphan designation threshold or it is judged that the product is sufficiently profitable so as not to justify maintenance of market exclusivity).

Even if we obtain orphan drug designation, we may not be the first to obtain marketing approval for any particular orphan indication due to the uncertainties associated with developing pharmaceutical products. Further, even if we obtain orphan drug exclusivity for a product candidate, that exclusivity may not effectively protect the product from competition because different drugs can be approved for the same uses or indications within the same rare disease or condition. Even after an orphan drug is approved, the FDA and foreign regulatory authorities can subsequently approve the same drug for the same approved use or indication within the same rare disease or condition if the FDA or foreign regulatory authorities concludes that the later drug is clinically superior in that it is safer, more effective, or makes a major contribution to patient care. Orphan drug designation neither shortens the development time or regulatory review time of a drug or biologic nor gives the drug or biologic any advantage in the regulatory review or approval process.

We have received Regenerative Medicine Advanced Therapy ("RMAT") and PRIority MEdicine ("PRIME") designation for 4D-150 for the treatment of wet AMD and RMAT designation for 4D-150 for treatment of DME. We may seek RMAT and PRIME designations for certain future product candidates, however we may not be able to obtain such designations, and there is no guarantee that 4D-150 will experience a faster regulatory review or obtain regulatory approval.

The FDA has granted RMAT designation for 4D-150 for the treatment of neovascular (wet) age-related macular degeneration and diabetic macular edema, and may seek additional RMAT designations for 4D-150 or for our other product candidates. A biological product candidate is eligible for RMAT designation if: (1) it meets the definition of a regenerative medicine therapy, which the FDA defines as a cell therapy, therapeutic tissue engineering product, human cell and tissue product, or any combination product using such therapies or products, with limited exceptions; (2) the candidate is intended to treat, modify, reverse, or cure a serious disease or condition; and (3) preliminary clinical evidence indicates that the candidate has the potential to address unmet medical needs for such disease or condition. RMAT designation provides potential benefits that include more frequent meetings with FDA to discuss the development plan for the product candidate, and eligibility for rolling review and priority review of BLAs. Product candidates granted RMAT designation may also be eligible for accelerated approval on the basis of a surrogate or intermediate endpoint reasonably likely to predict long-term clinical benefit, or through reliance upon data obtained from a meaningful number of sites, including through expansion of clinical trials to a sufficient number of sites, as appropriate. RMAT-designated product candidates that receive accelerated approval may, as appropriate, be able to fulfill their post-approval requirements through the submission of clinical evidence, clinical studies, patient registries, or other sources of real-world evidence (such as electronic health records), through the collection of larger confirmatory data sets, or via post-approval monitoring of patients treated with the therapy prior to approval.

RMAT designation is within the sole discretion of the FDA. Accordingly, even if we believe one of our product candidates meets the criteria for RMAT designation, the FDA may disagree and instead determine not to make such designation. RMAT designation does not change the standards for product approval, and there is no assurance that such designation or eligibility for such designation will result in expedited review or approval, or that the approved indication will not be narrower than the indication covered by the RMAT designation.

In the EU, 4D-150 was accepted into the PRIME scheme by the EMA's Committee for Medicinal Products for Human Use ("CHMP") for the treatment of wet AMD. In the EU, innovative products that target an unmet medical need and are expected to be of major public health interest may be eligible for a number of expedited development and review programs, such as the PRIME scheme, which was launched by the EMA in 2016 and provides incentives similar to the Breakthrough Therapy designation in the United States. PRIME is a voluntary scheme aimed at enhancing the EMA's support for the development of medicines that target an unmet medical need. It is based on increased interaction and early dialogue with companies developing promising medicines, to optimize their product development plans and speed up their evaluation to help them reach patients earlier. The benefits of a PRIME designation include the appointment of a rapporteur before submission of a marketing authorization application, early dialogue and scientific advice at key development milestones, and the potential to qualify products for accelerated review earlier in the application process.

Product developers that benefit from PRIME designation may be eligible for accelerated assessment (in 150 days instead of 210 days), which may be granted for medicinal products of major interest from a public health perspective or that target an unmet medical need, but this is not guaranteed.

Receipt of these designations does not increase the likelihood that FDA or EC will approve 4D-150 for any indication. In addition, the FDA or foreign competent authorities may rescind the designations if they believe that the designation is no longer supported by data from our clinical development program.

We have obtained a rare pediatric disease designation for 4D-710, however, there is no guarantee that FDA approval of 4D-710 will result in issuance of a priority review voucher.

In 2012, Congress authorized the FDA to award priority review vouchers to sponsors of certain rare pediatric disease product applications. This program is designed to encourage development of new drug and biological products for prevention and treatment of certain rare pediatric diseases. Specifically, under this program, a sponsor who receives an approval for a drug or biologic for a "rare pediatric disease" that meets certain criteria may qualify for a voucher that can be redeemed to receive a priority review of a subsequent marketing application for a different product. The sponsor of a rare pediatric disease drug product receiving a priority review voucher may transfer (including by sale) the voucher to another sponsor. The voucher may be further transferred any number of times before the voucher is used, as long as the sponsor making the transfer has not yet submitted the application. The FDA may also revoke any priority review voucher if the rare pediatric disease drug for which the voucher was awarded is not marketed in the U.S. within one year following the date of approval.

We have obtained a rare pediatric disease designation for 4D-710 for the treatment of cystic fibrosis, however, there is no guarantee that we will be able to obtain a priority review voucher, even if 4D-710 is approved by the FDA for this indication. For example, the FDA may determine that a BLA, even if ultimately approved, does not meet the eligibility criteria for a priority review voucher, including for the following reasons:

- the product no longer meets the definition of a rare pediatric disease;
- the product contains an active ingredient (including any ester or salt of the active ingredient) that has been previously approved in another marketing application;
- the application does not rely on clinical data derived from studies examining a pediatric population and dosages of the drug intended for that population;

- the application is approved for a different adult indication than the rare pediatric disease for which the product is designated

Moreover, Congress included a sunset provision in the statute authorizing the rare pediatric disease priority review voucher program. Under the current statutory sunset provisions, FDA may only award a voucher for an approved rare pediatric disease product application if the sponsor has rare pediatric disease designation for the product candidate, and that designation was granted by September 30, 2029, provided the relevant eligibility criteria are met.

If the product candidates that we or our collaborators may develop receive regulatory approval in the United States or another jurisdiction, they may never receive approval in other jurisdictions, which would limit market opportunities for such product candidates and seriously harm our business.

Approval of a product candidate in the United States by the FDA or by the requisite regulatory agencies in any other jurisdiction does not ensure approval of such product candidate by regulatory authorities in other countries or jurisdictions. The approval process varies among countries and may limit our or our collaborators' ability to develop, manufacture, promote and sell product candidates internationally. Failure to obtain marketing approval in international jurisdictions would prevent the product candidates from being marketed outside of the jurisdictions in which regulatory approvals have been received. In order to market and sell product candidates in the EU and many other jurisdictions, we and our collaborators must obtain separate marketing approvals and comply with numerous and varying regulatory requirements. The approval procedure varies among countries and may involve additional preclinical studies or clinical trials both before and after approval. In many countries, any product candidate for human use must be approved for reimbursement before it can be approved for sale in that country. In some cases, the intended price for such product is also subject to approval. Further, while regulatory approval of a product candidate in one country does not ensure approval in any other country, a failure or delay in obtaining regulatory approval in one country may have a negative effect on the regulatory approval process in others. If we or our collaborators fail to comply with the regulatory requirements in international markets or to obtain all required marketing approvals, the target market for a particular potential product will be reduced, which would limit our ability to realize the full market potential for the product and seriously harm our business.

Enacted and future healthcare legislation or regulation may increase the difficulty and cost for us to obtain marketing approval of and to commercialize our product candidates and may affect the prices we may set.

In the United States, the EU and other jurisdictions, there have been, and we expect there will continue to be, a number of legislative and regulatory changes and proposed changes to the healthcare system that could, among other things, restrict our ability to profitably sell our product candidates and could affect our future results of operations. In particular, there have been and continue to be a number of initiatives at the U.S. federal and state levels that seek to reduce healthcare costs and improve the quality of healthcare with the stated goals of containing healthcare costs, improving quality and/or expanding access. In the United States and elsewhere, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by major legislative and regulatory initiatives. 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 product candidates approved for sale. New and changing laws and regulations may also create uncertainty about how such laws and regulations will be interpreted and applied. If we are found to have violated laws and regulations, it could materially adversely affect our business, results of operations and financial condition.

For example, in 2010, the Patient Protection and Affordable Care Act (the "ACA") was enacted, which substantially changed the way healthcare is financed by both governmental and private payors. Among the provisions of the ACA of importance to our business, including, without limitation, our ability to

commercialize and to obtain adequate prices for any product candidates approved for sale, are the following:

- an annual, non-deductible fee payable by any entity that manufactures or imports certain branded prescription drugs and biologic agents (other than those designated as orphan drugs), which is apportioned among these entities according to their market share in certain government healthcare programs;
- expansion of manufacturers' rebate liability under the Medicaid Drug Rebate Program by increasing the minimum rebate for both branded and generic drugs, revising the "average manufacturer price" definition, and extending rebate liability from fee-for-service Medicaid utilization to include the utilization of Medicaid managed care organizations as well; and
- establishment of a Center for Medicare & Medicaid Innovation ("CMMI") at the Centers for Medicare & Medicaid Services ("CMS") to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending.

Since its enactment, there have been judicial, U.S. Congressional and executive branch challenges to certain aspects of the ACA. On June 17, 2021, the U.S. Supreme Court dismissed the most recent judicial challenge to the ACA brought by several states without specifically ruling on the constitutionality of the ACA.

In addition, other legislative changes have been proposed and adopted in the United States since the ACA was enacted. In August 2011, the Budget Control Act of 2011, among other things, led to aggregate reductions of Medicare payments to providers. In January 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, further reduced Medicare payments to several types of providers, including hospitals, imaging centers and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. Additionally, on March 11, 2021, the American Rescue Plan Act of 2021 was signed into law, which eliminated the statutory cap on drug manufacturers' Medicaid drug rebate program liability for single source and innovator multiple source drugs, beginning January 1, 2024. The rebate was previously capped at 100% of a drug's average manufacturer price.

In 2022, the Inflation Reduction Act of 2022 ("IRA") was signed into law. Among other things, the IRA requires manufacturers of certain drugs to engage in price negotiations with Medicare, 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); redesigns the Medicare Part D benefit (beginning in 2024); and replaces the Part D coverage gap discount program with a new manufacturer discount program (beginning in 2025). CMS has published the negotiated prices for the initial ten drugs, which went into effect in 2026, and the subsequent 15 drugs, which will first be effective in 2027, as well as the next set of 15 drugs that will be subject to negotiation. The IRA permits the Secretary of the Department of Health and Human Services ("HHS") to implement many of these provisions through guidance, as opposed to regulation, for the initial years. HHS has and will continue to issue and update guidance as these programs are implemented, although the Medicare drug price negotiation program is currently subject to legal challenges. The impact of the IRA on us and the pharmaceutical industry cannot yet be fully determined, but is likely to be significant.

The One Big Beautiful Bill Act, which was enacted in July 2025, imposes significant reductions in the funding of the Medicaid program. Such reductions are expected to decrease the number of persons enrolled in Medicaid and reduce the services covered by Medicaid, which could adversely affect our sales of any other product candidate that we commercialize.

The Trump administration is pursuing a two-fold strategy to reduce drug costs in the U.S. While it is unclear whether and how the Trump administration's proposals will be implemented, the Trump administration's policies are likely to have a negative impact on the pharmaceutical industry and on our ability to receive adequate revenues for our product candidates, if approved. On the one hand, the Trump administration has threatened to impose significant tariffs on pharmaceutical manufacturers that

do not adopt pricing policies such as most favored nation pricing, which would tie the price for drugs in the U.S. to the lowest price in a group of other countries. In response, multiple manufacturers have reportedly entered into confidential pricing agreements with the federal government. On the other hand, the Trump administration is pursuing traditional regulatory pathways to impose drug pricing policies, although final regulations have not yet been published. Even regulatory proposals or executive actions that are ultimately deemed unlawful could negatively impact the U.S. pharmaceutical sector and our business. In addition, pharmaceutical pricing and marketing has long been the subject of considerable discussion in Congress and among policymakers, and it is possible that Congress could enact additional laws that negatively affect the pharmaceutical industry.

Moreover, payment methodologies may be subject to changes in healthcare legislation and regulatory initiatives. For example, CMS may develop new payment and delivery models, such as bundled payment models. In addition, recently there has been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several U.S. Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to drug pricing, reduce the cost of prescription drugs under government payor programs, and review the relationship between pricing and manufacturer patient assistance programs. We also expect that additional U.S. federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that the U.S. federal government will pay for healthcare products and services, which could result in reduced demand for our product candidates or additional pricing pressures and could seriously harm our business.

Individual states in the United States have also increasingly passed legislation and implemented regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure, drug price reporting and other transparency measures. Some states have enacted legislation creating so-called prescription drug affordability boards, which ultimately may attempt to impose price limits on certain drugs in these states, while some states are also seeking to implement general, across the board price caps for pharmaceuticals, or are seeking to regulate drug distribution. Some measures are designed to encourage importation from other countries. Legally mandated price controls on payment amounts by third-party payors or other restrictions could seriously harm our business. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other healthcare programs. This could reduce the ultimate demand for our product candidates or put pressure on our product pricing. Furthermore, there has been increased interest by third-party payors and governmental authorities in reference pricing systems and publication of discounts and list prices. Prescription drugs and biological products that are in violation of these requirements will be included on a public list. These reforms could reduce the ultimate demand for our product candidates or put pressure on our product pricing and could seriously harm our business.

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

In the EU, similar political, economic and regulatory developments may affect our ability to profitably commercialize our product candidates, if approved. In addition to continuing pressure on prices

and cost containment measures, legislative developments at the EU or member state level may result in significant additional requirements or obstacles that may increase our operating costs. The delivery of healthcare in the EU, including the establishment and operation of health services and the pricing and reimbursement of medicines, is almost exclusively a matter for national, rather than EU, law and policy. National governments and health service providers have different priorities and approaches to the delivery of health care and the pricing and reimbursement of products in that context. In general, however, the healthcare budgetary constraints in most EU member states have resulted in restrictions on the pricing and reimbursement of medicines by relevant health service providers. Coupled with ever-increasing EU and national regulatory burdens on those wishing to develop and market products, this could prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to commercialize our product candidates, if approved. In markets outside of the United States and EU, reimbursement and healthcare payment systems vary significantly by country, and many countries have instituted price ceilings on specific products and therapies.

We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative or judicial action in the United States, the EU or any other jurisdiction. If we or any third parties we may engage are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we or such third parties are not able to maintain regulatory compliance, our product candidates may lose any regulatory approval that may have been obtained and we may not achieve or sustain profitability.

The successful commercialization of any product candidates for which we obtain approval will depend in part on the extent to which governmental authorities, private health insurers, and other third-party payors provide coverage and adequate reimbursement. Failure to obtain or maintain coverage and adequate reimbursement for our product candidates, if any and if approved, could limit our ability to market those products and decrease our ability to generate revenue.

Our ability to successfully commercialize any products that we may develop also will depend in part on the extent to which reimbursement for these products and related treatments will be available from government health administration authorities, private health insurers, and other organizations. Government authorities and other third-party payors, such as private health insurers and health maintenance organizations, decide which medications they will pay for and establish reimbursement levels.

The regulations that govern marketing approvals, pricing and reimbursement for new drugs vary widely from country to country. Some countries require approval of the sale price of a drug before it can be marketed. In many countries, the pricing review period begins after marketing or product licensing approval is granted. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we might obtain marketing approval for a product in a particular country, but then be subject to price regulations that delay our commercial launch of the product, possibly for lengthy time periods, and negatively impact the revenue we are able to generate from the sale of the product in that country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if any product candidates we may develop obtain marketing approval.

A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Government authorities and other third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Government authorities currently impose mandatory discounts for certain patient groups, such as Medicare, Medicaid and Veterans Affairs (“VA”) hospitals, and may seek to increase such discounts at any time. Future regulation may negatively impact the price of our products, if approved. Increasingly, other third-party payors are requiring that drug companies provide them with predetermined discounts from list prices and are challenging the prices charged for medical products. For genetic medicine and other products administered under the supervision of a physician, obtaining coverage and adequate reimbursement may be particularly difficult because of the higher prices often associated with such drugs. We cannot be sure that reimbursement will be available

for any product candidate that we commercialize and, if reimbursement is available, that the level of reimbursement will be sufficient.

Reimbursement may impact the demand for, or the price of, any product candidate for which we obtain marketing approval. In order to obtain reimbursement, physicians may need to show that patients have superior treatment outcomes with our products compared to standard of care drugs, including lower-priced generic versions of standard of care drugs. If reimbursement is not available or is available only at limited levels, we may not be able to successfully commercialize any product candidate for which we obtain marketing approval. In the United States, no uniform policy of coverage and reimbursement for products exists among third-party payors and coverage and reimbursement levels for products can differ significantly from payor to payor. As a result, the coverage determination process is often a time consuming and costly process that may require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance.

There may be significant delays in obtaining reimbursement for newly approved drugs, and coverage may be more limited than the purposes for which the medicine is approved by the FDA, EMA or other comparable foreign regulatory authorities. Moreover, eligibility for reimbursement does not imply that any drug will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale, and distribution. Interim reimbursement levels for new drugs, if applicable, may also not be sufficient to cover our costs and may not be made permanent. Reimbursement rates may vary according to the use of the drug and the clinical setting in which it is used, may be based on reimbursement levels already set for lower cost drugs and may be incorporated into existing payments for other services. Net prices for drugs may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of drugs from countries where they may be sold at lower prices than in the United States. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement policies. Our inability to promptly obtain coverage and profitable payment rates from both government-funded and private payors for any approved products we may develop could seriously harm our business.

Even if we obtain FDA approval for any of our product candidates, we may never obtain approval or commercialize such products outside of the United States, which would limit our ability to realize their full market potential.

In order to market any products outside of the United States, we must establish and comply with numerous and varying regulatory requirements of other countries regarding safety and efficacy. Clinical trials conducted in one country may not be accepted by regulatory authorities in other countries, and regulatory approval in one country does not mean that regulatory approval will be obtained in any other country. Approval procedures vary among countries and can involve additional product testing and validation and additional administrative review periods. Seeking foreign regulatory approvals could result in significant delays, difficulties and costs for us and may require additional preclinical studies or clinical trials which would be costly and time consuming. Regulatory requirements can vary widely from country to country and could delay or prevent the introduction of our products in those countries. Satisfying these and other regulatory requirements is costly, time consuming, uncertain and subject to unanticipated delays. In addition, our failure to obtain regulatory approval in any country may delay or have negative effects on the process for regulatory approval in other countries. We do not have any product candidates approved for sale in any jurisdiction, including international markets, and we do not have experience in obtaining regulatory approval in international markets. If we fail to comply with regulatory requirements in international markets or to obtain and maintain required approvals, our ability to realize the full market potential of our products will be harmed.

We currently have no sales organization. If we are unable to establish sales capabilities on our own or through third parties, we may not be able to market and sell any products effectively, if approved, or generate product revenue.

We currently do not have a marketing or sales organization. In order to commercialize any product, if approved, in the United States and foreign jurisdictions, we must build our marketing, sales, distribution, managerial and other non-technical capabilities or make arrangements with third parties to perform these services, and we may not be successful in doing so. In advance of any of our product candidates receiving regulatory approval, we expect to establish a sales organization with technical expertise and supporting distribution capabilities to commercialize each such product candidate, which will be expensive and time-consuming. We have no prior experience in the marketing, sale and distribution of pharmaceutical products, and there are significant risks involved in building and managing a sales organization, including our ability to hire, retain, and incentivize qualified individuals, generate sufficient sales leads, provide adequate training to sales and marketing personnel, and effectively manage a geographically dispersed sales and marketing team. Any failure or delay in the development of our internal sales, marketing and distribution capabilities would adversely impact the commercialization of these products. We may choose to collaborate with third parties that have direct sales forces and established distribution systems, either to augment our own sales force and distribution systems or in lieu of our own sales force and distribution systems. If we are unable to enter into such arrangements on acceptable terms or at all, we may not be able to successfully commercialize our product candidates. If we are not successful in commercializing products, either on our own or through arrangements with one or more third parties, we may not be able to generate any future product revenue and we would incur significant additional losses and our business would be seriously harmed.

Our business operations and current and future relationships with investigators, healthcare professionals, consultants, third-party payors, patient organizations and customers will be subject to applicable healthcare regulatory laws, which could expose us to penalties and seriously harm our business.

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

- the U.S. federal Anti-Kickback Statute, which prohibits, among other things, persons or entities from knowingly and willfully soliciting, offering, receiving or providing any remuneration (including any kickback, bribe, or certain rebate), directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, lease, order or recommendation of, any good, facility, item or service, for which payment may be made, in whole or in part, under any U.S. federal healthcare program, such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;
- the U.S. federal civil and criminal false claims and civil monetary penalties laws, including the civil federal False Claims Act, which can be enforced through civil whistleblower or *qui tam* actions, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, to the U.S. federal government, claims for payment or approval that are false or fraudulent, knowingly making, using or causing to be made or used, a false record or statement material to a false or fraudulent claim, or from knowingly making a false statement to avoid, decrease or conceal an obligation to pay money to the U.S. federal government. Pharmaceutical manufacturers can cause false claims to be presented to the U.S. federal government by engaging in impermissible marketing practices, such as the off-label promotion of a product for an indication for which it has not received FDA approval. In addition, the government may assert that a claim including items and services resulting from a

violation of the U.S. federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act;

- the federal Health Insurance Portability and Accountability Act of 1996 ("HIPAA"), which imposes criminal and civil liability for, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement, in connection with the delivery of, or payment for, healthcare benefits, items or services. Similar to the U.S. federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the healthcare fraud statute implemented under HIPAA or specific intent to violate it in order to have committed a violation;
- the FDCA, which prohibits, among other things, the adulteration or misbranding of drugs, biologics and medical devices;
- the U.S. Public Health Service Act, which prohibits, among other things, the introduction into interstate commerce of a biological product unless a biologics license is in effect for that product;
- the U.S. Physician Payments Sunshine Act and its implementing regulations, which require certain manufacturers of drugs, devices, biologics and medical supplies that are reimbursable under Medicare, Medicaid, or the Children's Health Insurance Program, with specific exceptions, to report annually to CMS information related to certain payments and other transfers of value to physicians (as defined by statute), certain other non-physician practitioners (including physician assistants, nurse practitioners, clinical nurse specialists, certified nurse anesthetists, anesthesiology assistants, and certified nurse midwives) and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members;
- analogous U.S. state laws and regulations, including: state anti-kickback and false claims laws, which may apply to our business practices, including but not limited to, research, distribution, sales and marketing arrangements and claims involving healthcare items or services reimbursed by any third-party payor, including private insurers; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the U.S. federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws and regulations that require drug manufacturers to file reports relating to pricing and marketing information, which requires tracking gifts and other remuneration and items of value provided to healthcare professionals and entities; and state and local laws requiring the registration of pharmaceutical sales representatives; and
- similar healthcare laws in the EU and other jurisdictions, including reporting requirements detailing interactions with and payments to healthcare providers.

We may also be subject to additional federal laws, such as the U.S. Foreign Corrupt Practices Act of 1977, as amended, which prohibits, among other things, 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 and foreign government owned or affiliated entities, candidates for foreign political office, and foreign political parties or officials thereof, and federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers.

Ensuring that our internal operations and future business arrangements with third parties comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices, including certain of our advisory board arrangements with physicians, some of whom are compensated in the form of stock or stock options, do not comply with current or future statutes, regulations, agency guidance or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of

any of the laws described above or any other governmental laws and regulations that may apply to us, we may be subject to significant penalties, including civil, criminal and administrative penalties, damages, fines, exclusion from government-funded healthcare programs, such as Medicare and Medicaid or similar programs in other countries or jurisdictions, integrity oversight and reporting obligations to resolve allegations of non-compliance, disgorgement, individual imprisonment, contractual damages, reputational harm, diminished profits and the curtailment or restructuring of our operations. If any of the physicians or other providers or entities with whom we expect to do business are found to not be in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs and imprisonment, which could affect our ability to operate our business. Further, defending against any such actions can be costly, time-consuming and may require significant personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired.

We use and generate materials that may expose us to material liability.

Our research programs involve the use of hazardous materials and chemicals. We are subject to foreign, federal, state and local environmental and health and safety laws and regulations governing, among other matters, the use, manufacture, handling, storage and disposal of hazardous materials and waste products such as human tissue samples that may have the potential to transmit diseases. We may incur significant costs to comply with these current or future environmental and health and safety laws and regulations. In addition, we cannot completely eliminate the risk of contamination or injury from hazardous materials and may incur material liability as a result of such contamination or injury. In the event of an accident, an injured party may seek to hold us liable for any damages that result. Any liability could exceed the limits or fall outside the coverage of our workers' compensation, property and business interruption insurance and we may not be able to maintain insurance on acceptable terms, if at all. We currently carry no insurance specifically covering environmental claims.

Compliance with governmental regulations regarding the treatment of animals used in research could increase our operating costs, which would adversely affect the commercialization of our products.

The Animal Welfare Act ("AWA") is the federal law that covers the treatment of certain animals used in research. Currently, the AWA imposes a wide variety of specific regulations that govern the humane handling, care, treatment and transportation of certain animals by producers and users of research animals, most notably relating to personnel, facilities, sanitation, cage size, and feeding, watering and shipping conditions. Third parties with whom we contract are subject to registration, inspections and reporting requirements under the AWA. Furthermore, some states have their own regulations, including general anti-cruelty legislation, which establish certain standards in handling animals. Comparable rules, regulations, and or obligations exist in many foreign jurisdictions. If we or our contractors fail to comply with regulations concerning the treatment of animals used in research, we may be subject to fines and penalties and adverse publicity, and our operations could be adversely affected.

Risks Related to Our Reliance on Third Parties

We expect to rely on third parties to conduct our clinical trials and some aspects of our research and preclinical testing, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials, research or testing.

We currently rely and expect to continue to rely on third parties, such as CROs, CDMOs, clinical data management organizations, clinical data assessments and analysis organizations, medical institutions and clinical investigators, to conduct some aspects of our manufacturing, research, preclinical testing and clinical trials. Any of these third parties may terminate their engagements with us or be unable to fulfill their contractual obligations. If we need to enter into alternative arrangements, it would delay our product development activities.

Our reliance on these third parties for research and development activities reduces our control over these activities, but does not relieve us of our responsibilities. For example, we remain responsible for ensuring that each of our clinical trials is conducted in accordance with the general investigational plan and protocols for the trial. Moreover, the FDA requires us to comply with GCP for conducting, recording and reporting the results of clinical trials to assure that data and reported results are credible, reproducible and accurate and that the rights, integrity and confidentiality of trial participants are protected. We are also required to register ongoing clinical trials and to post the results of completed clinical trials on a government-sponsored database within certain timeframes. Failure to do so can result in fines, adverse publicity and civil and criminal sanctions. Similar risks may exist in foreign jurisdictions.

If these third parties do not successfully carry out their contractual duties, meet expected deadlines or conduct our clinical trials in accordance with regulatory requirements or our stated protocols, we will not be able to obtain, or may be delayed in obtaining, marketing approvals for any product candidates we may develop and will not be able to, or may be delayed in our efforts to, successfully commercialize our medicines.

We also expect to rely on other third parties to manufacture, store and distribute drug supplies for our clinical trials. Any performance failure on the part of our manufacturers or distributors could delay clinical development, marketing approval or commercialization of any product candidates, producing additional losses and depriving us of potential product revenue.

We may depend on collaborations with third parties for the research, development and commercialization of certain of the product candidates we may develop. If any such collaborations are not successful, we may not be able to realize the market potential of those product candidates.

We have sought, and may in the future seek, third-party collaborators for the research, development and commercialization of certain product candidates we may develop. Our likely collaborators for any other collaboration arrangements include large and mid-size pharmaceutical companies, regional, national and international pharmaceutical companies, biotechnology companies and academic institutions. If we enter into any such arrangements with any third parties, we will likely have shared or limited control over the amount and timing of resources that our collaborators dedicate to the development or potential commercialization of any product candidates we may seek to develop with them. Our ability to generate revenue from these arrangements with commercial entities will depend on our collaborators' abilities to successfully perform the functions assigned to them in these arrangements. We cannot predict the success of any collaboration that we enter into.

Collaborations involving our product candidates we may develop, pose the following risks to us:

- collaborators generally have significant discretion in determining the efforts and resources that they will apply to these collaborations;
- collaborators may not properly obtain, maintain, enforce or defend intellectual property or proprietary rights relating to our product candidates or may use our proprietary information in such a way as to expose us to potential litigation or other intellectual property related proceedings, including proceedings challenging the scope, ownership, validity and enforceability of our intellectual property;
- collaborators may own or co-own intellectual property covering our product candidates that result from our collaboration with them, and in such cases, we may not have the exclusive right to commercialize such intellectual property or such product candidates;
- disputes may arise with respect to the ownership of intellectual property developed pursuant to collaborations;
- we may need the cooperation of our collaborators to enforce or defend any intellectual property we contribute to or that arises out of our collaborations, which may not be provided to us;

- collaborators may infringe the intellectual property rights of third parties, which may expose us to litigation and potential liability;
- disputes may arise between the collaborators and us that result in the delay or termination of the research, development or commercialization of our product candidates or that result in costly litigation or arbitration that diverts management attention and resources;
- collaborators may decide not to pursue development and commercialization of any product candidates we develop or may elect not to continue or renew development or commercialization programs based on clinical trial results, changes in the collaborator's strategic focus or available funding or external factors such as an acquisition that diverts resources or creates competing priorities;
- collaborators may delay clinical trials, provide insufficient funding for a clinical trial, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials, or require a new formulation of a product candidate for clinical testing;
- collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours;
- collaborators with marketing and distribution rights to one or more product candidates may not commit sufficient resources to the marketing and distribution of such product candidates;
- we may lose certain valuable rights under circumstances identified in our collaborations, including if we undergo a change of control;
- collaborators may undergo a change of control and the new owners may decide to take the collaboration in a direction which is not in our best interest;
- collaborators may become party to a business combination transaction and the continued pursuit and emphasis on our development or commercialization program by the resulting entity under our existing collaboration could be delayed, diminished or terminated;
- collaborators may become bankrupt, which may significantly delay our research or development programs, or may cause us to lose access to valuable technology, devices, materials, know-how or intellectual property of the collaborator relating to our products and product candidates;
- key personnel at our collaborators may leave, which could negatively impact our ability to productively work with our collaborators;
- collaborations may require us to incur short and long-term expenditures, issue securities that dilute our stockholders, or disrupt our management and business;
- collaborations may be terminated and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates or our Therapeutic Vector Evolution platform technology; and
- collaboration agreements may not lead to development or commercialization of product candidates in the most efficient manner or at all.

We may face significant competition in seeking appropriate collaborations. Recent business combinations among biotechnology and pharmaceutical companies have resulted in a reduced number of potential collaborators. In addition, the negotiation process is time-consuming and complex, and we may not be able to negotiate collaborations on a timely basis, on acceptable terms, or at all. If we are unable to do so, we may have to curtail the development of the product candidate for which we are seeking to collaborate or delay its potential commercialization or reduce the scope of any sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities

on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all. If we do not have sufficient funds, we may not be able to further develop product candidates or bring them to market and generate product revenue which could seriously harm our business.

If we enter into collaborations to develop and potentially commercialize any product candidates, we may not be able to realize the benefit of such transactions if we or our collaborator elect not to exercise the rights granted under the agreement or if we or our collaborator are unable to successfully integrate a product candidate into existing operations and company culture. In addition, if our agreement with any of our collaborators terminates, our access to technology and intellectual property licensed to us by that collaborator may be restricted or terminate entirely, which may delay our continued development of our product candidates utilizing the collaborator's technology or intellectual property or require us to stop development of those product candidates completely. We may also find it more difficult to find a suitable replacement collaborator or attract new collaborators, and our development programs may be delayed or the perception of us in the business and financial communities could be adversely affected. Any collaborator may also be subject to many of the risks relating to product development, regulatory approval, and commercialization described in this "Risk Factors" section, and any negative impact on our collaborators may adversely affect us.

Our reliance on Chinese biotechnology companies may subject us to additional risks.

Certain Chinese biotechnology companies, CROs and contract development and manufacturing organizations may become subject to trade restrictions, sanctions, other regulatory requirements, or proposed legislation by the U.S. government, which could potentially impact services available for our research and development or our ability to secure the materials we need for our product candidates. For example, the U.S. BIOSECURE Act, which was enacted in December 2025, prohibits federal agencies from procuring or using any biotechnology equipment or services from "biotechnology companies of concern", or entering into, extending, or renewing any contracts with entities that use such biotechnology equipment or services from "biotechnology companies of concern". Congress has interpreted a "biotechnology company of concern" as an entity that is under the control of a foreign adversary and that poses a risk to national security based on its research or multiomic data collection (e.g., collection of genomic information). While the U.S. BIOSECURE Act has a grandfathering period of five years for existing contracts, and has carveouts for manufacture of drugs for supply under Medicaid and Medicare Part B, subject to the Secretary of Veteran Affairs' discretion, the impact of the U.S. BIOSECURE Act on the biotechnology industry is uncertain. If the Chinese or other foreign CROs and CDMOs we rely on become subject to trade restrictions, sanctions, increased tariffs or other regulatory requirements by the U.S. government (including designation as a "biotechnology company of concern" under the U.S. BIOSECURE Act), or if the U.S. or Chinese government take retaliatory actions due to recent or increased tensions between the U.S. and China, it may have the potential to severely restrict the ability of U.S. biopharmaceutical companies like us to purchase services or products from, or otherwise collaborate with, certain "biotechnology companies of concern" without losing the ability to contract with, or otherwise receive funding from, the U.S. government. It is possible that some of our contractual counterparties could be impacted by the legislation described above. Such counterparties may be subject to U.S. legislation, sanctions, trade restrictions and other foreign regulatory requirements which could increase the cost or reduce the supply of material available to us, delay the procurement or supply of such material or have an adverse effect on our ability to secure significant commitments from governments to purchase our potential therapies. Such disruption could have adverse effects on the development of our product candidates.

Risks Related to Our Intellectual Property

Our success depends on our ability to protect our intellectual property and our proprietary technologies.

Our commercial success depends in part on our ability to obtain and maintain patent protection and trade secret protection for our product candidates, proprietary technologies and their uses as well as

our ability to operate without infringing upon the proprietary rights of others. We generally seek to protect our proprietary position by filing patent applications in the United States and abroad related to our product candidates, proprietary technologies and their uses that are important to our business. Our patent applications cannot be enforced against third parties practicing the technology claimed in such applications unless, and until, patents issue from such applications, and then only to the extent the issued claims cover the technology. There can be no assurance that our patent applications or those of our licensors will result in additional patents being issued or that issued patents will afford sufficient protection against competitors with similar technology, nor can there be any assurance that the patents issued will not be infringed, designed around or invalidated by third parties. Even issued patents may later be found invalid or unenforceable or may be modified or revoked in proceedings instituted by third parties before various patent offices or in courts. Further, our licensed patents and applications include five granted patents (U.S. patent nos. 12,310,997, 12,180,254, 11,136,557, 11,634,691 and 10,988,519) and two pending patent applications (U.S. patent application nos. 18/184,184 and 18/924,426), that were made with government support, that may be subject, under certain circumstances, to march-in-rights under 35 U.S.C. 203, which is a right that allows the government, in certain limited circumstances, to force a party with a license to intellectual property funded, at least in part, by the government, to grant a license to such property to another entity. U.S. patent nos. 11,136,557 and 11,634,691 were made with the support of U.C. Berkeley and relate to our A101 vector of our 4D-710 and 4D-725 product candidates. U.S. patent nos. 10,988,519 and 12,180,254 were made with the support of University of Pennsylvania and relate to our short-form human complement factor H (sCFH) payload of our 4D-175 product candidate. The degree of future protection for our proprietary rights is uncertain. Only limited protection may be available and may not adequately protect our rights or permit us to gain or keep any competitive advantage. If we do not adequately protect our intellectual property and proprietary technology, competitors may be able to use our product candidates and proprietary technologies and erode or negate any competitive advantage we may have, which could seriously harm our business.

We and our licensors have applied, and we intend to continue applying, for patents covering aspects of our product candidates, proprietary technologies and their uses that we deem appropriate. However, we may not be able to apply for patents on certain aspects of our current or future product candidates, proprietary technologies and their uses in a timely fashion, at a reasonable cost, in all jurisdictions, or at all, and any potential patent coverage we obtain may not be sufficient to prevent substantial competition.

The patent application process is subject to numerous risks and uncertainties, and there can be no assurance that we or any of our actual or potential future collaborators or licensors will be successful in protecting our product candidates, proprietary technologies and their uses by obtaining and defending patents. These risks and uncertainties include the following:

- the U.S. Patent and Trademark Office (“USPTO”) and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other provisions during the patent process, the noncompliance with which can result in abandonment or lapse of a patent or patent application, and partial or complete loss of patent rights in the relevant jurisdiction;
- patent applications may not result in any patents being issued;
- patents that may be issued or in-licensed may be challenged, invalidated, modified, revoked, circumvented, found to be unenforceable or otherwise may not provide any competitive advantage;
- our competitors, many of whom have substantially greater resources than we do and many of whom have made significant investments in competing technologies, may seek or may have already obtained patents that will limit, interfere with or eliminate our ability to make, use and sell our potential product candidates;
- other parties may have designed around our claims or developed technologies that may be related or competitive to our platform, may have filed or may file patent applications and may have received or may receive patents that overlap or conflict with our patent applications,

either by claiming the same methods or devices or by claiming subject matter that could dominate our patent position;

- any successful opposition to any patents owned by or licensed to us could deprive us of rights necessary for the practice of our technologies or the successful commercialization of any products or product candidates that we may develop;
- because patent applications in the United States and most other countries are confidential for a period of time after filing, we cannot be certain that we or our licensors were the first to file any patent application related to our product candidates, proprietary technologies and their uses;
- an interference proceeding can be provoked by a third party or instituted by the USPTO to determine who was the first to invent any of the subject matter covered by the patent claims of our licensors' patent applications for any patent application with an effective filing date before March 16, 2013;
- there may be significant pressure on the U.S. government and international governmental bodies to limit the scope of patent protection both inside and outside the United States for disease treatments that prove successful, as a matter of public policy regarding worldwide health concerns; and
- countries other than the United States may have patent laws less favorable to patentees than those upheld by U.S. courts, allowing foreign competitors a better opportunity to create, develop and market competing product candidates.

The patent prosecution process is also expensive and time-consuming, and we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection. Although we enter into non-disclosure and confidentiality agreements with parties who have access to patentable aspects of our research and development output, such as our employees, corporate collaborators, outside scientific collaborators, CROs, contract manufacturers, consultants and other third parties, any of these parties may breach such agreements and disclose such output before a patent application is filed, thereby jeopardizing our ability to seek patent protection.

The patent position of biopharmaceutical companies generally is highly uncertain, involves complex legal and factual questions, and has been the subject of much litigation in recent years. Moreover, the issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our patents, if issued, patents obtained by our collaborators or the patent rights that we license from others, may be challenged in the courts or patent offices in the United States and abroad. Once granted, patents may remain open to opposition, interference, re-examination, post-grant review, inter partes review, nullification or derivation action in court or before patent offices or similar proceedings for a given period after allowance or grant, during which time third parties can raise objections against such initial grant. Such challenges may result in loss of exclusivity or freedom to operate or in patent claims being narrowed, invalidated or held unenforceable, in whole or in part, which could limit our ability to stop others from using or commercializing similar or identical products or product candidates, or limit the duration of the patent protection of our product candidates. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, our intellectual property may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

Our ability to enforce our patent rights depends on our ability to detect infringement. It may be difficult to detect infringers who do not advertise the components or methods that are used in connection with their products and services. Moreover, it may be difficult or impossible to obtain evidence of infringement in a competitor's or potential competitor's product or service. We may not prevail in any

lawsuits that we initiate and the damages or other remedies awarded if we were to prevail may not be commercially meaningful.

In addition, proceedings to enforce or defend our patents could put our patents at risk of being invalidated, held unenforceable or interpreted narrowly. Such proceedings could also provoke third parties to assert claims against us, including that some or all of the claims in one or more of our patents are invalid or otherwise unenforceable. If any of our patents covering our product candidates are invalidated or found unenforceable, or if a court found that valid, enforceable patents held by third parties covered one or more of our product candidates, our competitive position could be harmed or we could be required to incur significant expenses to enforce or defend our rights. If we initiate lawsuits to protect or enforce our patents, or litigate against third-party claims, such proceedings would be expensive and would divert the attention of our management and technical personnel.

The degree of future protection for our proprietary rights is uncertain, and we cannot ensure that:

- any of our patents, or any of our pending patent applications, if issued, or those of our licensors, will include claims having a scope sufficient to protect our product candidates;
- any of our pending patent applications or those of our licensors may issue as patents;
- others will not or may not be able to make, use, offer to sell, or sell products that are the same as or similar to our own but that are not covered by the claims of the patents that we own or license;
- we will be able to successfully commercialize our product candidates on a substantial scale, if approved, before the relevant patents that we own or license expire;
- we or our licensors were the first to make the inventions covered by each of the patents and pending patent applications that we own or license;
- we or our licensors were the first to file patent applications for these inventions;
- others will not develop similar or alternative technologies that do not infringe the patents we own or license;
- any of the patents we own or license will be found to ultimately be valid and enforceable;
- any patents issued to us or our licensors will provide a basis for an exclusive market for our commercially viable products or will provide us with any competitive advantages;
- a third party may not challenge the patents we own or license and, if challenged, a court would hold that such patents are valid, enforceable and infringed;
- we may develop or in-license additional proprietary technologies that are patentable;
- the patents of others will not have an adverse effect on our business;
- our competitors do not conduct research and development activities in countries where we do not have enforceable patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we will develop additional proprietary technologies or product candidates that are separately patentable; or
- our commercial activities or products will not infringe upon the patents of others.

Where we obtain licenses from or collaborate with third parties, 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 technology that we license from third parties, or such activities, if controlled by us, may require the input of such third parties. We may also require the cooperation of our licensors and collaborators to enforce any licensed patent rights, and such cooperation may not be provided. Therefore, these patents and patent applications may not be prosecuted and enforced in a manner consistent with

the best interests of our business. Moreover, if we do obtain necessary licenses, we will likely have obligations under those licenses, and any failure to satisfy those obligations could give our licensor the right to terminate the license. Termination of a necessary license, or expiration of licensed patents or patent applications, could seriously harm our business.

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

The lives of our patents may not be sufficient to effectively protect our product candidates and business.

Patents have a limited lifespan. In the United States, the natural expiration of a patent is generally 20 years after its first effective non-provisional filing date. Although various extensions may be available, the life of a patent, and the protection it affords, are limited. Even if patents covering our product candidates, proprietary technologies and their uses are obtained, once the patent life has expired, we may be open to competition. In addition, although upon issuance in the United States a patent's life can be extended based on certain delays caused by the USPTO and clinical development, this extension can be reduced or eliminated based on certain delays caused by the patent applicant during patent prosecution. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. If we do not have sufficient patent life to protect our product candidates, proprietary technologies and their uses, our business would be seriously harmed.

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

Depending upon the timing, duration and specifics of FDA marketing approval of any of our product candidates, one or more of our U.S. patents may be eligible for limited patent term restoration under the Drug Price Competition and Patent Term Restoration Act of 1984, also known as the Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit a patent restoration term of up to five years as compensation for patent term lost during product development and the FDA regulatory review process. The Hatch-Waxman Act allows a maximum of one patent to be extended per FDA approved product 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 and only those claims covering such approved drug product, a method for using it or a method for manufacturing it may be extended. Patent term extension may also be available in certain foreign countries upon regulatory approval of our product candidates. However, we may not be granted an extension because of, for example, 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 restoration or the term of any such extension is less than we request, our competitors may obtain approval of competing products following our patent expiration of the applicable product, and our business may be seriously harmed.

Changes in patent law in the United States or in other countries could diminish the value of patents in general, thereby impairing our ability to protect our product candidates.

Our patent rights may be affected by developments or uncertainty in the U.S. or foreign patent statutes, patent case laws, USPTO rules and regulations or in the rules and regulations of foreign patent offices.

On September 16, 2011, the Leahy-Smith America Invents Act ("Leahy-Smith Act") was signed into law. There remains many subsisting issued patents and some pending patent applications in the U.S. that were filed prior to its enactment and are therefore subject to the pre-Leahy-Smith Act U.S. patent laws and that may have relevance to our freedom-to-operate or ability to obtain patent issuances. The Leahy-Smith Act includes a number of significant changes to the U.S. patent law. These include provisions that affect the way patent applications will be prosecuted and may also affect patent litigation. In particular, under the Leahy-Smith Act, the United States transitioned in March 2013 to a "first to file" system in which the first inventor to file a patent application will be entitled to the patent. Third parties are allowed to submit prior art before the issuance of a patent by the USPTO, and may become involved in post-grant proceedings including opposition, derivation, reexamination, inter partes review or interference proceedings challenging our patent rights or the patent rights of others. An adverse determination in any such submission, proceeding or litigation could reduce the scope or enforceability of, or invalidate, our patent rights, which could adversely affect our competitive position. This could have a negative impact on some of our intellectual property and could increase uncertainties surrounding obtaining and enforcement or defense of our issued patents. In addition, Congress may pass patent reform legislation that is unfavorable to us. The Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by Congress, the federal courts and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents we might obtain in the future. Similarly, statutory or judicial changes to the patent laws of other countries may increase the uncertainties and costs surrounding the prosecution of patent applications and the enforcement or defense of issued patents. Complying with these laws and regulations could limit our ability to obtain new patents in the future that may be important for our business.

Additionally, on June 1, 2023, the European Union Patent Package (EU Patent Package) regulations were implemented with the goal of providing a single pan-European Unitary Patent and a new European Unified Patent Court (UPC) for litigation involving European patents. As a result, all European patents, including those issued prior to ratification of the EU Patent Package, now by default automatically fall under the jurisdiction of the UPC. Our European patent applications, if issued, could be challenged in the UPC. During the first seven years of the UPC's existence, the UPC legislation allows a patent owner to opt its European patents out of the jurisdiction of the UPC. We may decide to opt out our future European patents from the UPC, but doing so may preclude us from realizing the benefits of the UPC. Moreover, if we do not meet all of the formalities and requirements for opt-out under the UPC, our future European patents could remain under the jurisdiction of the UPC. The UPC will provide our competitors with a new forum to centrally revoke our European patents, and allow for the possibility of a competitor to obtain a pan-European injunction. Such a loss of patent protection could have a material adverse impact on our business and our ability to commercialize our technology and product candidates and, resultantly, on our business, financial condition, prospects and results of operations.

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

Filing, prosecuting and defending all current and future patents in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States can be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we may not be able to prevent third parties from practicing our inventions in

all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where we have patent protection but enforcement is not as strong as that in the United States. These products may compete with our product candidates, and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Moreover, geo-political actions in the U.S. and in foreign countries could increase the uncertainties and costs surrounding the prosecution or maintenance of our patent applications or those of any current or future licensors and the maintenance, enforcement or defense of our issued patents or those of any current or future licensors. For example, the U.S. and foreign government actions related to Russia's conflict with Ukraine may limit or prevent filing, prosecution, and maintenance of patent applications in Russia. Government actions may also prevent maintenance of issued patents in Russia. For example, a decree was adopted by the Russian government in March 2022, allowing Russian companies and individuals to exploit inventions owned by patentees from the U.S. without consent or compensation. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and may export otherwise infringing products to territories where we have patent protection, but enforcement rights are not as strong as those in the United States. These products may compete with our product candidates and our patents or other IP rights may not be effective or sufficient to prevent them from competing.

The legal systems of many foreign countries do not favor the enforcement of patents and other intellectual property protection, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights. For example, some foreign countries have compulsory licensing laws under which a patent owner must grant licenses to third parties. In addition, some countries limit the enforceability of patents against third parties, including government agencies or government contractors. In these countries, patents may provide limited or no benefit. Proceedings to enforce our patent 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 and our patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license. 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 business may be seriously harmed.

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

Our agreements with employees and consultants provide that any inventions conceived by an individual in the course of rendering services to us shall be our exclusive property. Although our policy is to have all such individuals complete these agreements, we may not obtain these agreements in all circumstances, and individuals with whom we have these agreements may not comply with their terms. The assignment of intellectual property may not be self-executing and despite such agreement, such inventions may become assigned to third parties. In the event of unauthorized use or disclosure of our trade secrets or proprietary information, these agreements, even if obtained, may not provide meaningful protection, particularly for our trade secrets or other confidential information. We may also be subject to claims that former employees, consultants, or other third parties have an ownership interest in our patents or other intellectual property. In addition, we may face claims by third parties that our agreements with employees or consultants obligating them to assign intellectual property to us are ineffective or in conflict with prior or competing contractual obligations of assignment, which could result in ownership disputes regarding intellectual property we have developed or will develop and interfere with our ability to capture

the commercial value of such intellectual property. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights. Such an outcome could seriously harm our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and distraction to our management and other employees.

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

The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other provisions during the patent process. Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications will be due to be paid to the USPTO and various governmental patent agencies outside of the United States in several stages over the lifetime of the patents and/or applications. We employ reputable professionals and rely on such third parties to help us comply with these requirements and effect payment of these fees with respect to the patents and patent applications that we own, and if we license intellectual property we may have to rely upon our licensors to comply with these requirements and effect payment of these fees with respect to any patents and patent applications that we license. In many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. However, there are situations in which noncompliance can result in abandonment or lapse of a patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, competitors might be able to enter the market earlier than would otherwise have been the case. There could also be delays at the USPTO caused by staffing cuts and other U.S. government actions as a result of the U.S. Department of Government Efficiency or other executive actions to reduce the size of the U.S. government.

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

We rely on the protection of our trade secrets, including unpatented know-how, technology and other proprietary information to maintain our competitive position. We have taken steps to protect our trade secrets and unpatented know-how, including entering into confidentiality agreements with third parties, and confidential information and inventions agreements with employees and consultants. In addition to contractual measures, we try to protect the confidential nature of our proprietary information using commonly accepted physical and technological security measures. Despite these efforts, we cannot provide any assurances that all such agreements have been duly executed, and any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. In addition, such security measures may not provide adequate protection for our proprietary information, for example, in the case of misappropriation of a trade secret by an employee, consultant or third party with authorized access. Our security measures may not prevent an employee, consultant, collaborator or third party from misappropriating our trade secrets and providing them to a competitor, and recourse we take against such misconduct may not provide an adequate remedy to protect our interests fully. Monitoring unauthorized uses and disclosures is difficult, and we do not know whether the steps we have taken to protect our proprietary technologies will be effective. Unauthorized parties may also attempt to copy or reverse engineer certain aspects of our product candidates that we consider proprietary. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret can be difficult, expensive and time-consuming, and the outcome is unpredictable. Even though we use commonly accepted security measures, the criteria for protection of trade secrets can vary among different jurisdictions.

In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets. Moreover, third parties may still obtain this information or may come upon this or similar information independently, and we would have no right to prevent them from using that technology or information to compete with us. Trade secrets will over time be disseminated within the industry through

independent development, the publication of journal articles and the movement of personnel skilled in the art from company to company or academic to industry scientific positions. Further, we may need to share our trade secrets and confidential know-how with future business partners, collaborators, contractors and others located in countries at heightened risk of theft of trade secrets, including through direct intrusion by private parties or actors in other countries, and those affiliated with or controlled by state actors.

Though our agreements with third parties typically restrict the ability of our employees, collaborators, licensors, third-party contractors and consultants to publish data potentially relating to our trade secrets, our agreements may contain certain limited publication rights. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent such competitor from using that technology or information to compete with us, which could harm our competitive position. Because from time to time we have relied on, and in future expect to rely on third parties in the development, manufacture, and distribution of our product candidates and provision of our services, we must, at times, share trade secrets with them. Despite employing the contractual and other security precautions described above, the need to share trade secrets increases the risk that such trade secrets become known by our competitors, are inadvertently incorporated into the technology of others, or are disclosed or used in violation of these agreements. If any of these events occurs or if we otherwise lose protection for our trade secrets, the value of this information may be greatly reduced and our competitive position would be harmed. If we do not apply for patent protection prior to such publication or if we cannot otherwise maintain the confidentiality of our proprietary technology and other confidential information, then our ability to obtain patent protection or to protect our trade secret information may be jeopardized.

Our rights to develop and commercialize our product candidates are subject in part to the terms and conditions of licenses granted to us by others, and the patent protection, prosecution and enforcement for some of our product candidates may be dependent on our licensors.

We currently are reliant upon licenses of certain patent rights and proprietary technology from third parties that are important or necessary to the development of our technology, including technology related to our product candidates. For example, we rely on our exclusive license agreements with (i) U.C. Berkeley for certain rights with respect to the intellectual property covering certain compositions of matter and methods of use of certain AAV variants related to our 4D-710 and 4D-725 product candidates, and (ii) University of Pennsylvania for certain rights with respect to the intellectual property covering certain compositions of matter and methods of use of the short-form human complement factor H (sCFH) payload related to our 4D-175 product candidate. These and other licenses we may enter into in the future may not provide adequate rights to use such intellectual property and technology in all relevant fields of use or in all territories in which we may wish to develop or commercialize our technology and product candidates in the future. As a result, we may not be able to develop and commercialize our technology and product candidates in fields of use and territories for which we are not granted rights pursuant to such licenses.

Licenses to additional third-party technology that may be required for our development programs may not be available in the future or may not be available on commercially reasonable terms, which could seriously harm our business.

In some circumstances, we may not have the right to control the preparation, filing, prosecution and enforcement of patent applications, or to maintain the patents, covering technology that we license from third parties. In addition, some of our agreements with our licensors require us to obtain consent from the licensor before we can enforce patent rights, and our licensor may withhold such consent or may not provide it on a timely basis. Therefore, we cannot be certain that our licensors or collaborators will prosecute, maintain, enforce and defend such intellectual property rights in a manner consistent with the best interests of our business, including by taking reasonable measures to protect the confidentiality of know-how and trade secrets, or by paying all applicable prosecution and maintenance fees related to intellectual property registrations for any of our product candidates. We also cannot be certain that our licensors have drafted or prosecuted the patents and patent applications licensed to us in compliance with applicable laws and regulations, which may affect the validity and enforceability of such patents or

any patents that may issue from such applications. If they fail to do so, this could cause us to lose rights in any applicable intellectual property that we in-license, and as a result our ability to develop and commercialize products or product candidates may be adversely affected and we may be unable to prevent competitors from making, using and selling competing products.

Our current licenses, and our future licenses, likely will impose various royalty payments, milestones, and other obligations on us. If we fail to comply with any of these obligations, we may be required to pay damages and the licensor may have the right to terminate the license. Termination by the licensor would cause us to lose valuable rights, and could prevent us from developing and commercializing our product candidates and proprietary technologies. Our business would be seriously harmed if any current or future licenses terminate, if the licensors fail to abide by the terms of the license, if the licensors fail to enforce licensed patents against infringing third parties, if the licensed patents or other rights are found to be invalid or unenforceable, or if we are unable to enter into necessary licenses on acceptable terms. Furthermore, if any current or future licenses terminate, or if the underlying patents fail to provide the intended exclusivity, competitors or other third parties may gain the freedom to seek regulatory approval of, and to market, products identical to ours. Moreover, our licensors may own or control intellectual property that has not been licensed to us and, as a result, we may be subject to claims, regardless of their merit, that we are infringing or otherwise violating the licensor's rights. In addition, while we cannot currently determine the amount of royalty obligations we would be required to pay on the 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 product candidates that we successfully develop and commercialize, if any. Therefore, even if we successfully develop and commercialize any product candidates, we may be unable to achieve or maintain profitability.

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

Any trademarks we may register in the future or any current registered or unregistered trademarks or trade names may be challenged, infringed, circumvented or declared generic or determined to be infringing on other marks. We may not be able to protect our rights to these trademarks and trade names, which we need to build name recognition among potential partners or customers in our markets of interest. At times, competitors may adopt trade names or trademarks similar to ours, thereby impeding our ability to build brand identity and possibly leading to market confusion. In addition, there could be potential trade name or trademark infringement claims brought by owners of other trademarks or trademarks that incorporate variations of our registered or unregistered trademarks or trade names. Over the long term, if we are unable to establish name recognition based on our trademarks and trade names, then we may not be able to compete effectively and our business may be adversely affected. We may license our trademarks and trade names, to the extent any are registered, to third parties, such as distributors. Though these license agreements may provide guidelines for how our trademarks and trade names may be used, a breach of these agreements or misuse of our trademarks and tradenames by our licensees may jeopardize our rights in or diminish the goodwill associated with our trademarks and trade names. Our efforts to enforce or protect our proprietary rights related to trademarks, trade names, trade secrets, domain names, copyrights or other intellectual property may be ineffective and could result in substantial costs and diversion of resources and could seriously harm our business.

Intellectual property rights do not necessarily address all potential threats to our competitive advantage.

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 genetic medicine products that are similar to our product candidates or utilize similar genetic medicine technology but that are not covered by the claims of the patents that we own or have exclusively licensed;

- we or our licensors or future collaborators might not have been the first to make the inventions covered by the issued patents or pending patent applications that we own or have exclusively licensed;
- we or our licensors or future collaborators might not have been the first to file patent applications covering certain of our inventions;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- it is possible that our pending patent applications will not lead to issued patents;
- issued patents that we own or have exclusively licensed may be held invalid or unenforceable, 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; and
- the patents of others may have an adverse effect on our business.

Should any of these events occur, they could seriously harm our business.

Our existing collaborations and any collaboration arrangements that we may enter into in the future may not be successful, which could adversely affect our ability to develop and commercialize our products.

Our existing collaborations, such as our collaboration with Otsuka Pharmaceutical Co., Ltd. and any future collaborations that we enter into may not be successful. The success of our collaboration arrangements will depend heavily on the efforts and activities of our collaborators. Collaborations are subject to numerous risks, which may include that:

- collaborators have significant discretion in determining the efforts and resources that they will apply to collaborations;
- collaborators may not pursue development and commercialization of our product candidates or may elect not to continue or renew development or commercialization programs based on trial or test results, changes in their strategic focus due to the acquisition of competitive products, availability of funding or other external factors, such as a business combination that diverts resources or creates competing priorities;
- collaborators could independently develop, or develop with third parties, products and product candidates that compete directly or indirectly with our product candidates;
- a collaborator with marketing, manufacturing and distribution rights to one or more products and product candidates may not commit sufficient resources to or otherwise not perform satisfactorily in carrying out these activities;
- we could grant exclusive rights to our collaborators that would prevent us from collaborating with others;
- collaborators may not properly maintain or defend our intellectual property rights or may use our intellectual property or proprietary information in a way that gives rise to actual or threatened litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential liability;
- disputes may arise between us and a collaborator that causes the delay or termination of the research, development or commercialization of our current or future product candidates or that results in costly litigation or arbitration that diverts management attention and resources;

- collaborations may be terminated, and, if terminated, may adversely affect the price of our common stock and may result in a need for additional capital to pursue further development or commercialization of the applicable current or future product candidates;
- collaborators may own or co-own intellectual property covering our product candidates that results from our collaborating with them, and in such cases, we would not have the exclusive right to develop or commercialize such intellectual property; and
- a collaborator's sales and marketing activities or other operations may not be in compliance with applicable laws resulting in civil or criminal proceedings.

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

Reliance on third parties to conduct clinical trials, assist in research and development and to manufacture our product candidates, will at times require us to share trade secrets with them. We seek to protect our proprietary technology by in part entering into confidentiality agreements and, if applicable, material transfer agreements, consulting agreements or other similar agreements with our advisors, employees, third-party contractors and consultants prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information, including our trade secrets. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets become known by our competitors, are inadvertently incorporated into the technology of others, or are disclosed or used in violation of these agreements. Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor's independent discovery of our trade secrets or other unauthorized use or disclosure would impair our competitive position and may seriously harm our business.

We may fail to comply with any of our obligations under existing or future agreements pursuant to which we license or have otherwise acquired intellectual property rights or technology, which could result in the loss of rights or technology that are material to our business.

We are party to various agreements that we depend on to operate our business. Our rights to use currently licensed intellectual property, or intellectual property to be licensed in the future, are or will be subject to the continuation of and our compliance with the terms of these agreements. These agreements are complex, and certain provisions in such agreements may be susceptible to multiple interpretations which could lead to disputes, including but not limited to those regarding:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- the extent to which our proprietary technology and product candidates infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- the sublicensing of patent and other rights;
- diligence obligations under the license agreement and what activities satisfy those diligence obligations;
- the ownership of inventions and know-how resulting from the creation or use of intellectual property by us or our counterparties, alone or jointly;
- the scope and duration of our payment obligations;
- rights upon termination of such agreement; and
- the scope and duration of exclusivity obligations of each party to the agreement.

The resolution of any contractual interpretation dispute that may arise, if unfavorable to us, could seriously harm our business. Such resolution could narrow what we believe to be the scope of our rights

to the relevant intellectual property or technology, increase what we believe to be our financial or other obligations under the relevant agreement, or decrease the third party's financial or other obligations under the relevant agreement.

If disputes over intellectual property rights that we have licensed or acquired from third parties prevent or impair our ability to maintain our current license agreements on acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates. If we fail to comply with our obligations under current or future license agreements, these agreements may be terminated or the scope of our rights under them may be reduced and we might be unable to develop, manufacture or market any product that is licensed under these agreements.

Litigation or other proceedings or third-party claims of intellectual property infringement could require us to spend significant time and money and could prevent us from selling our products.

Our commercial success depends significantly on our ability to operate without infringing the patents and other proprietary rights of third parties. However, our research, development and commercialization activities may be subject to claims that we infringe or otherwise violate patents or other intellectual property rights owned or controlled by third parties. Claims by third parties that we infringe their proprietary rights may result in liability for damages or prevent or delay our developmental and commercialization efforts. We cannot assure you that our operations do not, or will not in the future, infringe existing or future patents or other proprietary rights of third parties.

Third parties may have or obtain patents or other proprietary rights that could limit our ability to make, use, sell, offer for sale or import our product candidates and future approved products, if any, or impair our competitive position. There is a substantial amount of litigation, both within and outside the United States, involving patent and other intellectual property rights in the biotechnology and pharmaceutical industries, including patent infringement lawsuits, interferences, oppositions, reexaminations, inter partes review proceedings and post-grant review proceedings before the USPTO and/or corresponding foreign patent offices. Numerous third-party U.S. and foreign issued patents and pending patent applications exist in the fields in which we are developing product candidates. 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.

Furthermore, the scope of a patent claim is determined by an interpretation of the law, the written disclosure in a patent and the patent's prosecution history and can involve other factors such as expert opinion. Our interpretation of the relevance or the scope of claims in a patent or a pending application may be incorrect, which may negatively impact our ability to market our products. Further, we may incorrectly determine that our technologies or product candidates are not covered by a third-party patent or may incorrectly predict whether a third party's pending patent application will issue with claims of relevant scope. Our determination of the expiration date of any patent in the United States or abroad that we consider relevant may be incorrect, which may negatively impact our ability to develop and market our product candidates.

As the biotechnology industry expands 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. Our competitors in both the United States and abroad, many of which have substantially greater resources and have made substantial investments in patent portfolios and competing technologies, may have applied for or obtained or may in the future apply for and obtain, patents that will prevent, limit or otherwise interfere with our ability to make, use and sell our product candidates. We do not always conduct independent reviews of pending patent applications of and patents issued to third parties. Patent applications in the United States and elsewhere are typically published approximately 18 months after the earliest filing for which priority is claimed, with such earliest filing date being commonly referred to as the priority date. Certain U.S. patent applications that will not be filed outside the United States can remain confidential until patents issue. In addition, patent applications in the United States and elsewhere can be pending for many years before issuance, or unintentionally abandoned patents or applications can be revived. Furthermore, pending patent applications that have been published can, subject to certain

limitations, be later amended in a manner that could cover our technologies, our product candidates or the use of our product candidates. As such, there may be applications of others now pending or recently revived patents of which we are unaware. These applications may later result in issued patents, or the revival of previously abandoned patents, that will prevent, limit or otherwise interfere with our ability to make, use or sell our product candidates. As a result, we may be unaware of third-party patents that may be infringed by commercialization of our product candidates, and cannot be certain that we were the first to file a patent application related to a product candidate or technology. Moreover, because patent applications can take many years to issue, there may be currently pending patent applications that may later result in issued patents that our product candidates may infringe. In addition, identification of third-party patent rights that may be relevant to our technology is difficult because patent searching is imperfect due to differences in terminology among patents, incomplete databases and the difficulty in assessing the meaning of patent claims. Any claims of patent infringement asserted by third parties would be time consuming and could:

- result in costly litigation;
- divert the time and attention of our technical personnel and management;
- cause development delays;
- prevent us from commercializing our product candidates until the asserted patent expires or is held finally invalid or not infringed in a court of law;
- require us to develop non-infringing technology, which may not be possible on a cost-effective basis;
- require us to pay damages to the party whose intellectual property rights we may be found to be infringing, which may include treble damages if we are found to have been willfully infringing such intellectual property;
- require us to pay the attorney's fees and costs of litigation to the party whose intellectual property rights we may be found to be infringing; and/or
- require us to enter into royalty or licensing agreements, which may not be available on commercially reasonable terms, or at all.

Although no third party has asserted a claim of patent infringement against us as of the date of this report, others may hold proprietary rights that could prevent our product candidates or any future products from being marketed. Any patent-related legal action against us claiming damages and seeking to enjoin commercial activities relating to our product candidates or proprietary technologies could subject us to potential liability for damages, including treble damages if we were determined to willfully infringe, and require us to obtain a license to manufacture or market our product candidates or any future products. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be time-consuming and a substantial diversion of management and employee resources from our business. We cannot predict whether we would prevail in any such actions or that any license required under any of these patents would be made available on commercially acceptable terms, if at all. Even if such licenses are available, we could incur substantial costs related to royalty payments for licenses obtained from third parties, which could negatively affect our gross margins, and the rights may be non-exclusive, which could give our competitors access to the same technology or intellectual property rights licensed to us. In addition, we cannot be certain that we could redesign our product candidates or proprietary technologies to avoid infringement, if necessary, or on a cost-effective basis. Accordingly, an adverse determination in a judicial or administrative proceeding, or the failure to obtain necessary licenses, could prevent us from developing and commercializing our product candidates or any future products which could seriously harm our business. In addition, intellectual property litigation, regardless of its outcome, may cause negative publicity and could prohibit us from marketing or otherwise commercializing our product candidates and technology.

If we collaborate with third parties in the development of technology in the future, our collaborators may not properly maintain or defend our intellectual property rights or may use our proprietary information

in such a way as to invite litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to litigation or potential liability. Further, collaborators may infringe the intellectual property rights of third parties, which may expose us to litigation and potential liability. Also, we may be obligated under our agreements with our collaborators, licensors, suppliers and others to indemnify and hold them harmless for damages arising from intellectual property infringement by us.

We may be involved in lawsuits to protect or enforce our patents or the patents of our licensors, which could be expensive, time consuming, and unsuccessful. Further, our issued patents could be found invalid or unenforceable if challenged.

Competitors may infringe our intellectual property rights or those of our licensors. To prevent infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time-consuming. In addition, in a patent infringement proceeding, a court or administrative tribunal may decide that a patent we own or license is not valid, is unenforceable and/or is not infringed. If we or any of our potential future collaborators were to initiate legal proceedings against a third party to enforce a patent directed at one of our product candidates, the defendant could counterclaim that our patent is invalid and/or unenforceable in whole or in part. In patent litigation in the United States, defendant counterclaims alleging invalidity and/or unenforceability are commonplace. Grounds for a validity challenge include an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness or non-enablement. Grounds for an unenforceability assertion could include 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 the USPTO, even outside the context of litigation. Similar mechanisms for challenging the validity and enforceability of a patent exist in foreign patent offices and may result in the revocation, cancellation, or amendment of any foreign patents we hold in the future. The outcome following legal assertions of invalidity and unenforceability is unpredictable, and prior art could render our patents or those of our licensors invalid. If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we could lose at least part, and perhaps all, of the patent protection on an affected product candidate. Such a loss of patent protection would seriously harm our business.

Interference or derivation proceedings provoked by third parties or brought by us or declared by the USPTO, or equivalent actions brought in foreign jurisdictions, may be necessary to determine the priority of inventions with respect to our patents or patent applications or those of our licensors. An unfavorable outcome could require us to cease using the related technology or to attempt to license rights to it from the prevailing party. Our business could be seriously harmed if the prevailing party does not offer us a license on commercially reasonable terms or at all, or if a non-exclusive license is offered and our competitors gain access to the same technology. Our defense of litigation or interference proceedings may fail and, even if successful, may result in substantial costs and distract our management and other employees. In addition, the uncertainties associated with litigation could have a material adverse effect on our ability to raise the funds necessary to continue our clinical trials, continue our research programs, license necessary technology from third parties or enter into development or manufacturing partnerships that would help us bring our product candidates to market.

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

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of our common stock.

We may not be successful in obtaining or maintaining necessary rights to our product candidates through acquisitions and licenses.

We currently have rights to the intellectual property, through licenses from third parties and under patents that we own, to develop our product candidates. Because our programs may require the use of proprietary rights held by third parties, the growth of our business will depend in part on our ability to acquire, license or use these proprietary rights. We may be unable to acquire or license any compositions, methods of use, processes or other third-party intellectual property rights from third parties that we identify as necessary for our product candidates. The licensing and acquisition of third-party intellectual property rights is a competitive area, and a number of more established companies are also pursuing 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, cash resources and greater clinical development and commercialization capabilities. In addition, companies that perceive us to be a competitor may be unwilling to assign or license rights to us. 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.

We have collaborated with a U.S. academic institution and may in the future collaborate with U.S. and foreign academic institutions to accelerate our preclinical research or development under written agreements with these institutions. These institutions may provide us with an option to negotiate a license to any of the institution's rights in technology resulting from the collaboration. Regardless of such option, we may be unable to negotiate a license within the specified timeframe or under terms that are acceptable to us. If we are unable to do so, the institution may offer the intellectual property rights to other parties, potentially blocking our ability to pursue our program.

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 that program and our business could be seriously harmed.

We may be subject to claims that we have wrongfully hired an employee from a competitor or that we, our employees or consultants have wrongfully used or disclosed alleged confidential information or trade secrets of their former or concurrent employers or former or current clients.

As is common in the biotechnology and biopharmaceutical industries, in addition to our employees, we engage the services of consultants to assist us in the development of our product candidates. Many of these consultants, and many of our employees, were previously employed at, or may have previously provided or may be currently providing consulting services to, other biotechnology or biopharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees and consultants do not use the proprietary information or know-how of others in their work for us, we may become subject to claims that we, our employees or a consultant inadvertently or otherwise used or disclosed trade secrets or other information proprietary to their former employers or their former or current clients. We may also be subject to claims that patents and applications we have filed to protect inventions of our employees or consultants, even those related to one or more of our product candidates, are rightfully owned by their former or concurrent employer or former or current client. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, which could seriously harm our business. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to our management and other employees.

Risks Related to Our Operations

We are highly dependent on our key personnel, and if we are not successful in attracting, motivating and retaining highly qualified personnel, we may not be able to successfully implement our business strategy.

Our ability to compete in the highly competitive biotechnology and pharmaceutical industries depends upon our ability to attract, motivate and retain highly qualified managerial, scientific and medical personnel. The loss of the services provided by any of our executive officers, other key employees, and other scientific and medical advisors, and our inability to find suitable replacements, could result in delays in the development of our product candidates and harm our business.

We conduct our operations at our facilities in Emeryville, California, 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 expect that we may need to recruit talent from outside of our region, and doing so may be costly and difficult.

To induce valuable employees to remain at our company, in addition to salary and cash incentives, we have provided equity grants. The value to employees of these equity grants that vest over time may be significantly affected by movements in our stock price that are beyond our control, and may at any time be insufficient to counteract more lucrative offers from other companies. In addition, our employees are employed at-will, which means that any of our employees could leave our employment at any time, with or without notice. If we are unable to attract, incentivize and retain quality personnel on acceptable terms, or at all, it could seriously harm our business.

We will need to grow the size and capabilities of our organization, and we may experience difficulties in managing this growth.

As our development plans and strategies evolve, we must add a significant number of additional managerial, operational, financial and other personnel. Future growth will impose significant added responsibilities on members of management, including:

- identifying, recruiting, integrating, retaining and motivating additional employees;
- managing our internal development efforts effectively, including the clinical and FDA review process for our current and future product candidates, while complying with our contractual obligations to contractors and other third parties;
- expanding our operational, financial and management controls, reporting systems and procedures; and
- managing increasing operational and managerial complexity.

Our future financial performance and our ability to continue to develop and, if approved, commercialize our product candidates will depend, in part, on our ability to effectively manage any future growth. Our management may also have to divert a disproportionate amount of its attention away from day-to-day activities in order to manage these growth activities.

We currently rely, and for the foreseeable future will continue to rely, in substantial part on certain independent organizations, advisors and consultants to provide certain services. There can be no assurance that the services of these independent organizations, advisors and consultants will continue to be available to us on a timely basis when needed, or that we can find qualified replacements. In addition, if we are unable to effectively manage our outsourced activities or if the quality or accuracy of the services provided by consultants is compromised for any reason, our clinical trials may be extended, delayed, or terminated, and we may not be able to obtain regulatory approval of our product candidates or otherwise advance our business. There can be no assurance that we will be able to manage our

existing consultants or find other competent outside contractors and consultants on economically reasonable terms, if at all.

If we are not able to effectively expand our organization by hiring new employees and expanding our groups of consultants and contractors, we may not be able to successfully implement the tasks necessary to further develop our product candidates and, accordingly, may not achieve our research, development and commercialization goals.

Unfavorable global economic 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 and in the global financial markets. Portions of our future clinical trials may be conducted outside of the United States and unfavorable economic conditions resulting in the weakening of the U.S. dollar would make those clinical trials more costly to operate. Furthermore, a severe or prolonged economic downturn, including a recession or depression resulting from factors such as increased inflation or closure of or liquidity issues at financial institutions or other macro factors such as a pandemic or geopolitical tensions could result in a variety of risks to our business, including weakened demand for our product candidates or any future product candidates, if approved, and our ability to raise additional capital when needed on acceptable terms, if at all. A weak or declining economy or political disruption, including any international trade disputes, could also strain our manufacturers or suppliers, possibly resulting in supply disruption, or cause our customers to delay making payments for our potential products. Any of the foregoing could seriously harm our business, and we cannot anticipate all of the ways in which the political or economic climate and financial market conditions could seriously harm our business.

If we engage in acquisitions or strategic partnerships, this may increase our capital requirements, dilute our stockholders, cause us to incur debt or assume contingent liabilities and subject us to other risks.

We may engage in various acquisitions and strategic partnerships in the future, including licensing or acquiring complementary products, intellectual property rights, technologies or businesses. Any acquisition or strategic partnership may entail numerous risks, including:

- increased operating expenses and cash requirements;
- the assumption of indebtedness or contingent liabilities;
- the issuance of our equity securities which would result in dilution to our stockholders;
- assimilation of operations, intellectual property, products and product candidates of an acquired company, including difficulties associated with integrating new personnel;
- the diversion of our management’s attention from our existing product candidates and initiatives in pursuing such an acquisition or strategic partnership;
- retention of key employees, the loss of key personnel, and uncertainties in our ability to maintain key business relationships;
- risks and uncertainties associated with the other party to such a transaction, including the prospects of that party and their existing products or product candidates and regulatory approvals; and
- our inability to generate revenue from acquired intellectual property, technology and/or products sufficient to meet our objectives or even to offset the associated transaction and maintenance costs.

In addition, if we undertake such a transaction, we may incur large one-time expenses and acquire intangible assets that could result in significant future amortization expense.

Our information technology systems, or those used by our third-party research institution collaborators, CROs or other contractors or consultants, may fail or suffer security breaches and other disruptions.

We collect and maintain information in digital form that is necessary to conduct our business, and we are increasingly dependent on information technology systems and infrastructure to operate our business. In the ordinary course of our business, we collect, store and transmit large amounts of confidential information, including intellectual property, clinical trial data, proprietary business information and personal information of our employees and contractors (collectively, "Confidential Information"). It is critical that we do so in a secure manner to maintain the confidentiality and integrity of such confidential information. Despite the implementation of security measures, our internal information technology systems and those of our collaborators, future CROs and other contractors and consultants may be vulnerable to attack, damage and interruption from computer viruses and malware (e.g. ransomware), malicious code, misconfigurations, "bugs" or other vulnerabilities, natural disasters, terrorism, war, telecommunication and electrical failures, hacking, cyberattacks, phishing attacks and other social engineering schemes, denial or degradation of service attacks, and sophisticated nation-state and nation-state supported actors.

The risk of a security breach or disruption, particularly through cyberattacks or cyber intrusion, including by computer hackers, foreign governments and cyber terrorists, has generally increased as the number, intensity and sophistication of attempted attacks and intrusions from around the world have increased. We and our third party service providers and partners may also face increased cybersecurity risks due to our reliance on internet technology and the number of our employees who are working remotely, which may create additional opportunities for cybercriminals to exploit vulnerabilities. Furthermore, because the techniques used to obtain unauthorized access to, or to sabotage, systems change frequently and often are not recognized until launched against a target, we may be unable to anticipate these techniques or implement adequate preventative measures. We may experience security breaches that may remain undetected for an extended period. Even if identified, we may be unable to adequately investigate or remediate incidents or breaches due to attackers increasingly using tools and techniques, including artificial intelligence, that are designed to circumvent controls, to avoid detection, and to remove or obfuscate forensic evidence. Our third party service providers and partners are also subject to these heightened risks. The costs to us to investigate and mitigate network security problems, bugs, viruses, worms, malicious software programs and security vulnerabilities could be significant, and while we have implemented security measures to protect our data security and information technology systems, our efforts to address these problems may not be successful, and these problems could result in unexpected interruptions, delays, cessation of service, negative publicity and other harm to our business and our competitive position. There can also be no assurance that our and our collaborators', future CROs' and other contractors' and consultants' cybersecurity risk management program and processes, including policies, controls or procedures, will be fully implemented, complied with or effective in protecting our systems, networks and Confidential Information.

We and certain of our service providers have experienced certain cyberattacks and security incidents from time to time. Although to our knowledge we have not experienced any significant system failure or security breach to date, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our development programs and our business operations, whether due to a loss, corruption or unauthorized disclosure of our Confidential Information or other similar disruptions. For example, the loss of clinical trial data from completed, ongoing or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. If a security breach or other incident were to result in the unauthorized access to or unauthorized use, disclosure, release or other processing of clinical trial data or personal data, it may be necessary to notify individuals, governmental authorities, supervisory bodies, the media, and other parties pursuant to privacy and security laws.

Likewise, we rely on our third-party research institution collaborators for research and development of our product candidates and other third parties for the manufacture of our product candidates and to conduct clinical trials, and similar events relating to their information technology systems could also

seriously harm our business. Any security compromise affecting us, our partners or our industry, whether real or perceived, could harm our reputation, erode confidence in the effectiveness of our security measures, and lead to regulatory scrutiny. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or systems, or inappropriate disclosure of Confidential Information, we could incur liability, our competitive position could be harmed, and the further development and commercialization of our product candidates could be delayed. Any losses, costs or liabilities may not be covered by, or may exceed the coverage limits of, any applicable insurance policies.

Furthermore, federal, state and international laws and regulations can expose us to enforcement actions and investigations by regulatory authorities, and potentially result in regulatory penalties, fines and significant legal liability, if our information technology security efforts fail. Any adverse impact to the availability, integrity or confidentiality of our or third-party systems or Confidential Information can result in legal claims or proceedings (such as class actions), regulatory investigations and enforcement actions, fines and penalties, negative reputational impacts that cause us to lose existing or future customers, and/or significant incident response, system restoration or remediation and future compliance costs. We may also be exposed to a risk of loss or litigation and potential liability, which could materially and adversely affect our business, results of operations or financial condition.

Business disruptions could seriously harm our business.

Our operations, and those of our CROs, CDMOs, suppliers, and other contractors and consultants, could be subject to earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, medical epidemics and other natural or man-made disasters or business interruptions, for which we are partly uninsured. In addition, we rely on our third-party research institution collaborators for conducting research and development of our product candidates, and they may be affected by government shutdowns or withdrawn funding. The occurrence of any of these business disruptions could seriously harm our business.

All of our operations including our corporate headquarters are located in multiple facilities in Emeryville, California. Damage or extended periods of interruption to our corporate, development or research facilities due to fire, earthquake and other natural disaster, power loss, communications failure, unauthorized entry or other events could cause us to cease or delay development of some or all of our product candidates. Although we maintain property damage and business interruption insurance coverage on these facilities, our insurance might not cover all losses under such circumstances and our business could be seriously harmed by such delays and interruption.

Actual or perceived failures to comply with applicable data protection, privacy and security laws, regulations, standards and other requirements could adversely affect our business, results of operations, and financial condition.

The global data protection landscape is rapidly evolving, and we are or may become subject to numerous state, federal and foreign laws, requirements and regulations governing the collection, use, disclosure, retention, and security of personal data, such as information that we may collect in connection with clinical trials in the United States and abroad. Implementation standards and enforcement practices are likely to remain uncertain for the foreseeable future, and we cannot yet determine the impact future laws, regulations, standards, or perception of their requirements may have on our business. This evolution may create uncertainty in our business, affect our ability to operate in certain jurisdictions or to collect, store, transfer use and share personal information, necessitate the acceptance of more onerous obligations in our contracts, result in liability or impose additional costs on us. The cost of compliance with these laws, regulations and standards is high and is likely to increase in the future. Any failure or perceived failure by us to comply with federal, state or foreign laws or regulation, our internal policies and procedures or our contracts governing our processing of personal information could result in negative publicity, government investigations and enforcement actions, claims by third parties and damage to our reputation, any of which could seriously harm our business.

As our operations and business grow, we may become subject to or affected by new or additional data protection laws and regulations and face increased scrutiny or attention from regulatory authorities. In the United States, HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, and regulations implemented thereunder (collectively, "HIPAA"), imposes, among other things, certain standards on certain health care providers, health plans, and health care clearinghouses, known as covered entities, as well as their business associates that perform certain services that involve creating, receiving, maintaining or transmitting individually identifiable health information for or on behalf of such covered entities, and their covered subcontractors. We may obtain health information from third parties (including research institutions from which we obtain clinical trial data) that are subject to privacy and security requirements under HIPAA. Depending on the facts and circumstances, we could be subject to significant penalties if we violate HIPAA.

Certain states have also adopted comparable privacy and security laws and regulations, which govern the privacy, processing and protection of health-related and other personal information. Such laws and regulations will be subject to interpretation by various courts and other governmental authorities, thus creating potentially complex compliance issues for us and our future customers and strategic partners. For example, the California Consumer Privacy Act, as amended by the California Privacy Rights Act (collectively, the "CCPA") requires covered businesses that process the personal information of California residents to, among other things: (i) provide certain disclosures to California residents regarding the business's collection, use, and disclosure of their personal information; (ii) receive and respond to requests from California residents to access, delete, and correct their personal information, or to opt out of certain disclosures of their personal information; and (iii) enter into specific contractual provisions with service providers that process California resident personal information on the business's behalf. Similar laws have passed in other states, reflecting a trend toward more stringent privacy legislation in the United States. The enactment of such laws could have potentially conflicting requirements that would make compliance challenging. In the event that we are subject to or affected by HIPAA, the CCPA or other domestic privacy and data protection laws, any liability from failure to comply with the requirements of these laws could adversely affect our financial condition.

In Europe, the European Union General Data Protection Regulation (the "EU GDPR") and the United Kingdom General Data Protection Regulation and Data Protection Act 2018 (collectively, the "UK GDPR") (the EU GDPR and UK GDPR together referred to as the "GDPR") impose strict requirements for processing the personal data of individuals within the European Economic Area ("EEA") and in the United Kingdom, respectively. Companies that must comply with the GDPR face increased compliance obligations and risk, including more robust regulatory enforcement of data protection requirements and potential fines for noncompliance of up to €20 million / £17.5 million or 4% of the annual global revenue of the noncompliant undertaking, whichever is greater. Since we are subject to the supervision of relevant data protection authorities under multiple legal regimes (including under both the EU GDPR and the UK GDPR), we could be fined under each of those regimes independently in respect of the same breach. In addition to fines, a breach of the GDPR may result in regulatory investigations, reputational damage, orders to cease or change our data processing activities, enforcement notices, assessment notices (for a compulsory audit) and/or civil claims (including class actions). Among other requirements, the GDPR regulates transfers of personal data subject to the GDPR to third countries that have not been found to provide adequate protection to such personal data, including the United States, and the efficacy and longevity of current transfer mechanisms between the EEA and the United States remains uncertain. Case law from the Court of Justice of the European Union ("CJEU") states that reliance on the standard contractual clauses - a standard form of contract approved by the European Commission as an adequate personal data transfer mechanism - alone may not necessarily be sufficient in all circumstances and that transfers must be assessed on a case-by-case basis. We expect the existing legal complexity and uncertainty regarding international personal data transfers to continue. As the regulatory guidance and enforcement landscape in relation to data transfers continue to develop, including circumstances where the SCCs cannot be used, and/or start taking enforcement action, we could suffer additional costs, complaints and/or regulatory investigations or fines, and/or if we are otherwise unable to transfer personal data between and among countries and regions in which we operate, it could affect the manner in which we operate our business, the geographical location or segregation of our relevant systems and operations, and could adversely affect our financial results.

Additionally, the Securities and Exchange Commission (the "SEC") recently adopted a rule that enhances and standardizes disclosures regarding cybersecurity risk management and governance, as well as material cybersecurity incidents. Under this new rule, we will be required to make annual disclosures describing our processes for identifying and managing material cybersecurity risks, management's role in assessing and managing such risks and our board of directors' oversight of cybersecurity risks. We will also be required to disclose, in a Current Report on Form 8-K, the nature, scope and timing of any material cybersecurity incidents identified and the material impact or reasonably likely material impact on the company. We expect to face increased costs to comply with this new SEC cybersecurity rule, including increased costs for cybersecurity training and management.

As we continue to expand into other foreign countries and jurisdictions, we may be subject to additional laws and regulations that may affect how we conduct business.

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

Our business may be affected by the evolving regulatory framework for AI Technologies.

We use artificial intelligence ("AI"), machine learning, and automated decision-making technologies, (collectively, "AI Technologies") in our business. We expect that increased investment will be required in the future to continuously improve our use of AI Technologies. As with many technological innovations, there are significant risks involved in developing, maintaining and deploying these technologies, including that AI-generated content, analyses, or recommendations we utilize could be deficient, that our competitors may more quickly or effectively adopt AI capabilities, or that our use of AI or other emerging technologies increases regulatory, cybersecurity and other significant risks. There can be no assurance that the usage of or our investments in such technologies will always enhance our products or services or be beneficial to our business, including our efficiency or profitability.

In particular, if the models underlying our AI Technologies are: incorrectly designed or implemented; trained or reliant on incomplete, inadequate, inaccurate, biased or otherwise poor quality data, or on data to which we do not have sufficient rights or in relation to which we and/or the providers of such data have not implemented sufficient legal compliance measures; used without sufficient oversight and governance to ensure their responsible use; and/or adversely impacted by unforeseen defects, technical challenges, cybersecurity threats or material performance issues, the performance of our products, services and business, as well as our reputation, could suffer or we could incur liability resulting from the violation of laws or contracts to which we are a party or civil claims.

We are in varying stages of development in relation to our products and internal business processes involving AI Technologies. The continuous development, maintenance and operation of our AI Technologies is expensive and complex, and may involve unforeseen difficulties including material performance problems, undetected defects or errors. For instance, the models underlying AI Technologies can experience decay (also known as "model drift") in which its performance and accuracy decreases over time without further human intervention to correct such decay.

We may not be successful in our ongoing development and maintenance of these technologies in the face of novel and evolving technical, reputational and market factors. Our efforts to develop proprietary AI models could increase our operating costs. Our ability to develop proprietary AI models may be limited by our access to processing infrastructure or training data, and we may be dependent on third-party providers for such resources.

The regulatory framework for AI Technologies is rapidly evolving as many federal, state, and foreign government bodies and agencies have introduced or are currently considering additional laws and regulations. Additionally, existing laws and regulations may be interpreted in ways that would affect the operation of our AI Technologies. As a result, implementation standards and enforcement practices are likely to remain uncertain for the foreseeable future, and we cannot yet determine the impact future laws, regulations, standards, or market perception of their requirements may have on our business and may not always be able to anticipate how to respond to these laws or regulations. Failure to appropriately respond to this evolving landscape may result in reputational, competitive and business harm as well as litigation and regulatory action and fines, penalties and expenses related thereto.

It is possible that new laws and regulations will be adopted in the U.S. and in other non-U.S. jurisdictions, or that existing laws and regulations, including competition and antitrust laws, may be interpreted in ways that would limit our ability to use AI Technologies for our business, or require us to change the way we use AI Technologies in a manner that negatively affects the performance of our products, services, and business and the way in which we use AI Technologies. We may need to expend resources to adjust our products or services in certain jurisdictions if the laws, regulations, or decisions are not consistent across jurisdictions. Further, the cost to comply with such laws, regulations, or decisions and/or guidance interpreting existing laws, could be significant and would increase our operating expenses (such as by imposing additional reporting obligations regarding our use of AI Technologies). Such an increase in operating expenses, as well as any actual or perceived failure to comply with such laws and regulations, could adversely affect our business, financial condition and results of operations.

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

Under Sections 382 and 383 of the United States Internal Revenue Code of 1986, as amended (the "Code"), if a corporation undergoes an "ownership change" (generally defined as a greater than 50-percentage-point cumulative change (by value) in the equity ownership of certain stockholders over a rolling three-year period), the corporation's ability to use its pre-change net operating loss carryforwards ("NOLs") and other pre-change tax attributes to offset its post-change taxable income or taxes may be limited. If finalized, Treasury Regulations currently proposed under Section 382 of the Code may further limit our ability to utilize our pre-change NOLs or other pre-change tax attributes if we undergo a future ownership change. We have experienced ownership changes in the past. We may also experience ownership changes as a result of any future shifts in our stock ownership, some of which are outside our control. As a result, our ability to use our NOLs and other pre-change tax attributes to offset post-change taxable income or taxes may be subject to limitation. We will be unable to use our NOLs or other tax attributes if we do not attain profitability sufficient to offset our available NOLs or other tax attributes prior to their expiration, to the extent subject to expiration.

Changes in tax laws or regulations that are applied adversely to us or our customers may seriously harm our business.

New income, sales, use or other tax laws, statutes, rules, regulations or ordinances could be enacted at any time, which could affect the tax treatment of any of our future domestic and foreign earnings. Any new taxes could adversely affect our domestic and international business operations, and our business and financial performance. Further, existing tax laws, statutes, rules, regulations or ordinances could be interpreted, changed, modified or applied adversely to us.

Risks Related to Ownership of Our Common Stock

The market price of our common stock may be volatile, which could result in substantial losses for investors.

Some of the factors that may cause the market price of our common stock to fluctuate include:

- results from, and any delays in, our clinical trials for our clinical-stage product candidates or any other future clinical development programs;
- the success of existing or new competitive products or technologies;
- commencement or termination of collaborations for our product candidates;
- failure or discontinuation of any of our product candidates;
- failure to develop our Therapeutic Vector Evolution platform technology;
- results of preclinical studies, clinical trials or regulatory approvals of product candidates of our competitors, or announcements about new research programs or product candidates of our competitors;
- regulatory or legal developments in the United States and other countries, including sanctions imposed by either the U.S. or foreign governments;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the recruitment or departure of key personnel;
- the commencement of litigation;
- the level of expenses related to any of the research programs or product candidates that we may develop;
- the results of our efforts to develop additional product candidates or products;
- actual or anticipated changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- announcement or expectation of additional financing efforts;
- sales of our common stock by us, our insiders, or other stockholders;
- variations in our financial results or those of companies that are perceived to be similar to us;
- changes in estimates or recommendations by securities analysts, if any, that cover our stock;
- changes in the structure of healthcare payment systems;
- the impact of political instability, natural disasters, war and/or events of terrorism, such as the war between Ukraine and Russia, and the corresponding tensions created from such conflict between Russia, the United States and countries in Europe as well as other countries such as China, and the ongoing war in the Middle East;
- market conditions in the pharmaceutical and biotechnology sectors;
- general economic, industry, and market conditions; and
- the other factors described in this “Risk Factors” section.

In recent years, the stock market in general, and the market for pharmaceutical and biotechnology companies in particular, has experienced significant price and volume fluctuations that have often been unrelated or disproportionate to changes in the operating performance of the companies whose stock is experiencing those price and volume fluctuations. Further, the stock market in general has been highly

volatile due to macroeconomic factors such as higher inflation and increased interest rates and political uncertainty in the United States. Broad market and industry factors may seriously affect the market price of our common stock, regardless of our actual operating performance. Since the completion of our initial public offering in December 2020, the price of our common stock has been volatile, and we expect such volatility to continue. Following periods of such volatility in the market price of a company's securities, securities class action litigation has often been brought against that company. Because of the potential volatility of our stock price, we may become the target of securities litigation in the future. Securities litigation could result in substantial costs and divert management's attention and resources from our business.

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 could decline.

The trading market for our common stock relies in part on the research and reports that industry or financial analysts publish about us or our business. If one or more of these analysts should drop research coverage of us or 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, we could lose visibility in the market for our stock, which in turn could cause our stock price to decline.

Sales of a substantial number of shares of our common stock in the public market could occur at any time, which could cause the market price of our common stock to decline significantly, even if our business is doing well.

Sales of a substantial 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 our common stock intend to sell shares, could reduce the market price of our common stock.

Further, shares issued upon the exercise of stock options outstanding under our equity incentive plans, or pursuant to future awards granted under those plans, will become available for sale in the public market to the extent permitted by the provisions of applicable vesting schedules and Rule 144 and Rule 701 under the Securities Act of 1933, as amended (the "Securities Act").

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

We will seek additional capital through one or a combination of public and private equity offerings, debt financings, strategic partnerships and alliances and licensing arrangements. We, and indirectly, our stockholders, will bear the cost of issuing and servicing such securities. Because our decision to issue debt or equity securities in any future offering will depend on market conditions and other factors beyond our control, we cannot predict or estimate the amount, timing or nature of any future offerings. To the extent that we raise additional capital through the sale of equity securities, your ownership interest will be diluted, and the terms may include liquidation or other preferences that adversely affect your rights as a stockholder. The incurrence of indebtedness would result in increased fixed payment obligations and could involve restrictive covenants, such as limitations on our ability to incur additional debt, limitations on our ability to acquire, sell or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business. Additionally, any future collaborations we enter into with third parties may provide capital in the near term but limit our potential cash flow and revenue in the future. If we raise additional funds through strategic partnerships and alliances and licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies or product candidates, or grant licenses on terms unfavorable to us.

Additionally, as of December 31, 2025, there are pre-funded warrants outstanding to purchase 10,335,665 shares of common stock, which are exercisable at a nominal exercise price. If holders of these pre-funded warrants exercise these securities, existing shareholders will suffer dilution to their voting power and the Company may experience dilution in its earnings per share, as well as a negative impact on its share price.

Insiders have substantial influence over us, which could limit your ability to affect the outcome of key transactions, including a change of control.

Our directors, executive officers, holders of more than 5% of our outstanding stock and their respective affiliates beneficially own shares representing approximately 48% of our outstanding common stock as of December 31, 2025. As a result, these stockholders, if they act together, will be able to influence our management and affairs and all matters requiring stockholder approval, including the election of directors and approval of significant corporate transactions. This concentration of ownership may have the effect of delaying or preventing a change in control of our company and might affect the market price of our common stock.

We incur significant costs as a result of operating as a public company, and our management devotes substantial time to public company compliance initiatives. We may fail to comply with the rules that apply to public companies, including Section 404 of the Sarbanes-Oxley Act of 2002, which could result in sanctions or other penalties that would seriously harm our business.

We incur significant legal, accounting and other expenses as a public company, including costs resulting from public company reporting obligations under the Exchange Act and regulations regarding corporate governance practices. The listing requirements of the Nasdaq Global Select Market and the rules of the SEC require that we satisfy certain corporate governance requirements relating to director independence, filing annual and interim reports, stockholder meetings, approvals and voting, soliciting proxies, conflicts of interest and a code of conduct. Our management and other personnel will need to devote a substantial amount of time to ensure that we comply with all of these requirements. Moreover, the reporting requirements, rules and regulations have and will likely continue to increase our legal and financial compliance costs and will make some activities more time-consuming and costly. Any changes we make to comply with these obligations may not be sufficient to allow us to satisfy our obligations as a public company on a timely basis, or at all. These reporting requirements, rules and regulations, coupled with the increase in potential litigation exposure associated with being a public company, could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors or board committees or to serve as executive officers, or to obtain certain types of insurance, including directors' and officers' insurance, on acceptable terms.

We are subject to Section 404 of The Sarbanes-Oxley Act of 2002 ("Section 404") and the related rules of the SEC, which generally require our management and independent registered public accounting firm to report on the effectiveness of our internal control over financial reporting. Section 404 requires an annual management assessment of the effectiveness of our internal control over financial reporting. Our compliance with Section 404 requires that we incur substantial expense and expend significant management efforts.

During the course of our review and testing, we may identify deficiencies and be unable to remediate them before we must provide the required reports. Furthermore, if we have a material weakness in our internal controls over financial reporting, we may not detect errors on a timely basis and our financial statements may be materially misstated. We or our independent registered public accounting firm may not be able to conclude on an ongoing basis that we have effective internal control over financial reporting, which could harm our operating results, cause investors to lose confidence in our reported financial information and cause the trading price of our stock to fall. In addition, as a public company we will be required to file accurate and timely quarterly and annual reports with the SEC under the Exchange Act. In order to report our results of operations and financial statements on an accurate and timely basis, we will depend in part on CROs to provide timely and accurate notice of their costs to us.

Provisions in our amended and restated certificate of incorporation and amended and restated bylaws and Delaware law might discourage, delay or prevent a change in control of our company or changes in our management and, therefore, depress the market price of our common stock.

Our amended and restated certificate of incorporation and amended and restated bylaws contain provisions that could depress the market price of our common stock by acting to discourage, delay or prevent a change in control of our company or changes in our management that the stockholders of our Company may deem advantageous. These provisions, among other things:

- 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;
- eliminate cumulative voting in the election of directors;
- authorize our board of directors to issue shares of preferred stock and determine the price and other terms of those shares, including preferences and voting rights, without stockholder approval;
- provide our board of directors with the exclusive right to elect a director to fill a vacancy or newly created directorship;
- provide that our directors may be removed only for cause;
- permit stockholders to only take actions at a duly called annual or special meeting and not by written consent;
- prohibit stockholders from calling a special meeting of stockholders;
- provide for a staggered board, which will result in only a few directors being up for re-election in each calendar year;
- require that stockholders give advance notice to nominate directors or submit proposals for consideration at stockholder meetings;
- authorize our board of directors, by a majority vote, to amend the bylaws;
- require the affirmative vote of at least 66 2/3% or more of the outstanding shares of our common stock to amend many of the provisions described above; and
- limit the liability of, and provide indemnification to, our directors and officers.

In addition, Section 203 of the General Corporation Law of the State of Delaware ("DGCL") prohibits a publicly-held Delaware corporation from engaging in a business combination with an interested stockholder, generally a person which together with its affiliates owns, or within the last three years has owned, 15% of our voting stock, for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in a prescribed manner.

Any provision of our certificate of incorporation, bylaws, or Delaware law that has the effect of delaying or preventing a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our capital stock and could also affect the price that some investors are willing to pay for our common stock.

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

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

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

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

Our amended and restated certificate of incorporation and amended and restated bylaws provide that the Court of Chancery of the State of Delaware will be the exclusive forum for certain disputes between us and 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 and amended and restated bylaws provide that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware (or, in the event that the Court of Chancery does not have jurisdiction, the federal district court for the District of Delaware or other state courts of the State of Delaware) shall, to the fullest extent permitted by law, by the sole and exclusive forum for any derivative action or proceeding brought on our behalf, any action asserting a claim of breach of fiduciary duty, any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, our amended and restated certificate of incorporation or our amended and restated bylaws, or any action asserting a claim against us that is governed by the internal affairs doctrine; provided that, the exclusive forum provision will not apply to suits brought to enforce any liability or duty created by the Exchange Act or any other claim for which the federal courts have exclusive jurisdiction; and provided further that, if and only if the Court of Chancery of the State of Delaware dismisses any such action for lack of subject matter jurisdiction, such action may be brought in another state or federal court sitting in the State of Delaware. Our amended and restated certificate of incorporation and amended and restated bylaws also provide that the federal district courts of the United States of America will be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act, including all causes of action asserted against any defendant to such complaint. Nothing in our amended and restated certificate of incorporation and amended and restated bylaws precludes stockholders that assert claims under the Exchange Act from bringing such claims in state or federal court, subject to applicable law.

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 any of our directors, officers, other employees or stockholders, which may discourage lawsuits with respect to such claims, although our stockholders will

not be deemed to have waived our compliance with federal securities laws and the rules and regulations thereunder. Furthermore, the enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that a court could find these types of provisions to be inapplicable or unenforceable. While the Delaware courts have determined that such choice of forum provisions are facially valid, a stockholder may nevertheless seek to bring a claim in a venue other than those designated in the exclusive forum provisions, and there can be no assurance that such provisions will be enforced by a court in those other jurisdictions. If a court were to find the choice of forum provision that will be contained in our amended and restated certificate of incorporation and amended and restated bylaws to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could seriously harm our business. Any person or entity purchasing or otherwise acquiring any interest in our shares of capital stock shall be deemed to have notice of and consented to this exclusive forum provision, but will not be deemed to have waived our compliance with the federal securities laws and the rules and regulations thereunder.

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

We do not currently intend to pay any cash dividends on our common stock for the foreseeable future. We currently intend to invest our future earnings, if any, to fund our growth. Therefore, you are not likely to receive any dividends on your common stock for the foreseeable future. Since we do not intend to pay dividends, your ability to receive a return on your investment will depend on any future appreciation in the market value of our common stock. There is no guarantee that our common stock will appreciate or even maintain the price at which our holders have purchased it.

Unfavorable conditions in the global economy caused by global political unrest or conflicts, including the ongoing conflict between Russia and Ukraine and in the Middle East, may exacerbate certain risks we face.

Political unrest, international conflict, terrorism or war, such as Russia's invasion of Ukraine and the armed conflict in the Middle East, and the global response to these conflicts, including the imposition of sanctions by the United States and other countries, could create or exacerbate risks facing our business. We have evaluated our operations and partner contracts, and we currently do not expect existing conflicts to directly have a significant effect on our financial condition or results of operations. However, if hostilities persist, escalate or expand, risks that we have identified in this Annual Report on Form 10-K may be materially increased. For example, if our supply arrangements or clinical operations 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 cyberattacks could expand as part of the ongoing conflicts, which could adversely affect our ability to maintain or enhance our cyber security measures. These and other risks are described more fully in this "Risk Factors" section.

General Risk Factors

Any legal proceedings or claims against us could be costly and time-consuming to defend and could harm our reputation regardless of the outcome.

We may in the future become subject to legal proceedings and claims that arise in the ordinary course of business, such as disputes or employment claims made by our current or former employees. Any litigation, whether meritorious or not, could harm our reputation, increase our costs and may divert management's attention, time and resources, which may in turn seriously harm our business. Insurance might not cover such claims, might not provide sufficient payments to cover all the costs to resolve one or more such claims, and might not continue to be available on terms acceptable to us. A claim brought against us that is uninsured or underinsured could result in unanticipated costs and could seriously harm our business.

If product liability lawsuits are brought against us, we may incur substantial liabilities and may be required to limit commercialization of our 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 when and if we commercialize any products. For example, we may be sued if our product candidates cause or are perceived to cause injury or are 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 or a breach of warranties. Claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to cease commercialization of our product candidates. Even successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased or interrupted demand for our products;
- substantial monetary awards to trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- injury to our reputation;
- withdrawal of clinical trial participants and inability to continue clinical trials;
- initiation of investigations by regulators;
- costs to defend the related litigation;
- a diversion of management's time and our resources;
- loss of revenue;
- exhaustion of any available insurance and our capital resources;
- the inability to commercialize any product candidate; and
- a decline in our share price.

Our inability to obtain 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, alone or with collaborators. Our insurance policies may have various exclusions, and we may be subject to a product liability claim for which we have no coverage. We may have to pay any amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are not covered by our insurance, and we may not have, or be able to obtain, sufficient capital to pay such amounts. Even if our agreements with any future corporate collaborators entitle us to indemnification against losses, such indemnification may not be available or adequate should any claim arise.

Our employees, independent contractors, consultants, research or commercial partners or collaborators and vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

We are exposed to the risk of fraud, misconduct or other illegal activity by our employees, independent contractors, consultants, research or commercial partners or other collaborators, including the foundations we work with, and vendors. Misconduct by these parties could include intentional, reckless and negligent conduct that fails to: comply with the laws of the FDA, EMA and other comparable foreign regulatory authorities; provide true, complete and accurate information to the FDA, EMA and other comparable foreign regulatory authorities; comply with manufacturing standards we have established; comply with healthcare fraud and abuse laws in the United States and similar foreign fraudulent misconduct laws; or report financial information or data accurately or to disclose unauthorized activities to us. If we obtain FDA approval of 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. In particular, research, sales, marketing, education and other business arrangements in the healthcare industry are subject to extensive laws designed to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, educating, marketing and promotion, sales and commission, certain customer incentive programs and other business arrangements generally. Activities subject to these laws also involve the improper use of information obtained in the course of patient recruitment for clinical trials, which could result in regulatory sanctions and cause serious harm to our reputation. It is not always possible to identify and deter misconduct by employees and third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws. In addition, we are subject to the risk that a person or government could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could seriously harm our business, including the imposition of significant fines or other sanctions.

If we or any contract manufacturers and suppliers we engage fail to comply with environmental, health, and safety laws and regulations, we could become subject to fines or penalties or incur costs that could seriously harm our business.

We and any contract manufacturers and suppliers we engage are subject to numerous federal, state and local environmental, health, and safety laws, regulations, and permitting requirements, including those governing laboratory procedures; the generation, handling, use, storage, treatment and disposal of hazardous and regulated materials and wastes; the emission and discharge of hazardous materials into the ground, air and water; and employee health and safety. Our operations involve the use of hazardous and flammable materials, including chemicals and biological materials. Our operations also produce hazardous waste. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials. In the event of contamination or injury resulting from our use of hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. Under certain environmental laws, we could be held responsible for costs relating to any contamination at our current or past facilities and at third-party facilities. We also could incur significant costs associated with civil or criminal fines and penalties.

Compliance with applicable environmental laws and regulations may be expensive, and current or future environmental laws and regulations may impair our research, product development and manufacturing efforts. In addition, we cannot entirely eliminate the risk of accidental injury or contamination from these materials or wastes. 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 carry specific biological or hazardous waste insurance coverage, and our property, casualty, and general liability insurance policies specifically exclude coverage for damages and fines arising from biological or hazardous waste exposure or contamination. Accordingly, in the event of contamination or injury, we could be held liable for damages or be penalized with fines in an amount exceeding our resources, and our clinical trials or regulatory approvals could be suspended, which could seriously harm our business.

Our business could be negatively impacted by corporate citizenship and ESG matters and/or our reporting of such matters.

Institutional, individual, and other investors, proxy advisory services, regulatory authorities, consumers and other stakeholders have increasingly focused on environmental, social and governance ("ESG") practices of companies. As we look to respond to evolving standards for identifying, measuring, and reporting ESG metrics, our efforts may result in a significant increase in costs and may nevertheless not meet investor or other stakeholder expectations and evolving standards or regulatory requirements, which may negatively impact our financial results, our reputation, our ability to attract or retain employees,

our attractiveness as an investment or business partner, or expose us to government enforcement actions, private litigation, and actions by stockholders or stakeholders.

Item 1B. Unresolved Staff Comments.

None.

Item 1C. Cybersecurity.

Cybersecurity Risk Management and Strategy

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

We design and assess our program based on the National Institute of Standards and Technology Cybersecurity Framework ("NIST CSF"). This does not imply that we meet any particular technical standards, specifications, or requirements, only that we use the NIST CSF as a guide to help us identify, assess, and manage cybersecurity risks relevant to our business.

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

Our cybersecurity risk management program includes:

- risk assessments designed to help identify material cybersecurity risks to our critical systems, information, products, services, and our broader enterprise IT environment;
- data integrity controls designed to protect our clinical data and our proprietary manufacturing and Chemistry, Manufacturing, and Controls ("CMC") data;
- a security team principally responsible for managing (1) our cybersecurity risk assessment processes, (2) our security controls, and (3) our response to cybersecurity incidents;
- the use of external service providers, where appropriate, to assess, test or otherwise assist with aspects of our security controls, including annual penetration testing;
- cybersecurity awareness training of our employees, incident response personnel, and senior management;
- a cybersecurity incident response plan that includes procedures for responding to cybersecurity incidents for evaluating their materiality, and for ensuring their timely public disclosure when required; and
- a third-party risk management process for service providers and suppliers.

We have not identified risks from known cybersecurity threats, including as a result of any prior cybersecurity incidents, that have materially affected or are reasonably likely to materially affect us, including our operations, business strategy, results of operations, or financial condition. However, a significant breach involving our clinical trial data or proprietary manufacturing processes could result in regulatory delays or the loss of competitive advantages.

Cybersecurity Governance

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

The Committee receives quarterly reports from management on our cybersecurity risks. In addition, management updates the Committee, as necessary, regarding any material cybersecurity incidents, as well as any incidents with lesser impact potential.

The Committee reports to the full Board regarding its activities, including those related to cybersecurity. The Committee members receive presentations on cybersecurity topics from our Senior Vice President, Information Technology & Facilities, internal security staff or external experts as part of the Committee's continuing education on topics that impact public companies.

Our management team, including our Sr. Director, Information Technology Operations and Security, is responsible for assessing and managing our material risks from cybersecurity threats. The team has primary responsibility for our overall cybersecurity risk management program and supervises both our internal cybersecurity personnel and our retained external cybersecurity consultants. Our management team's experience includes decades of security management in the Financial & Life Sciences industries.

Our management team supervises efforts to prevent, detect, mitigate, and remediate 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 consultants engaged by us; and alerts and reports produced by security tools deployed in the IT environment.

Item 2. Properties.

Our corporate headquarters are located in Emeryville, California, where we lease approximately 91,000 square feet of office, research and development, engineering, laboratory and warehouse space pursuant to lease agreements that expire between August 2026 and December 2030. We believe that our facilities are adequate to meet our current needs, and that suitable additional alternative spaces will be available in the future on commercially reasonable terms, if required.

Item 3. Legal Proceedings.

We are not currently a party to any material legal proceedings.

From time to time, the Company may become involved in legal proceedings arising from the ordinary course of its business. If applicable, the Company records a liability for such matters when it believes that it is both probable that a liability may have been incurred, and the amount of the liability can be reasonably estimated. Significant judgment by the Company is required to determine both probability and the estimated amount. Regardless of outcome, litigation can have an adverse impact on us because of defense and settlement costs, diversion of management resources and other factors.

Item 4. Mine Safety Disclosures.

None.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Our common stock has been listed on the Nasdaq Global Select Market under the symbol "FDMT" since December 11, 2020. Prior to this date, there was no public market for our common stock.

Holders of Common Stock

As of March 16, 2026, there were approximately 11 holders of record of our common stock. The approximate number of holders is based upon the actual number of holders registered in our records at such date and excludes holders in "street name" or persons, partnerships, associations, corporations, or other entities identified in security positions listings maintained by depository trust companies.

Dividend Policy

We have never declared or paid any cash dividends on our common stock and do not anticipate paying cash dividends in the foreseeable future. Any future determination related to dividend policy will be made at the discretion of our board of directors.

Securities Authorized for Issuance under Equity Compensation Plans

Information about our equity compensation plans is incorporated herein by reference to Item 12 of Part III of this Annual Report on Form 10-K.

Recent Sales of Unregistered Securities

None.

Purchases of Equity Securities by the Issuer and Affiliated Purchases

None.

Item 6. [Reserved]

Part II. Item 6 is no longer required pursuant to certain amendments to Regulation S-K that eliminated Item 301.

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

You should read the following discussion and analysis of our financial condition and results of operations together with our financial statements and the related notes included elsewhere in this Annual Report on Form 10-K (this "report"). This discussion and analysis and other parts of this report contain forward-looking statements based upon current beliefs, plans and expectations related to future events and our future financial performance that involve risks, uncertainties and assumptions, such as statements regarding our intentions, plans, objectives, expectations, forecasts and projections. Our actual results and the timing of selected events could differ materially from those anticipated in these forward-looking statements as a result of several factors, including those set forth under the section titled "Risk Factors" and elsewhere in this report.

Overview

We are a leading late-stage biotechnology company advancing durable and disease-targeted therapeutics with potential to transform treatment paradigms and provide unprecedented benefits to patients. Our primary focus is advancing 4D-150 for wet age-related macular degeneration ("wet AMD") and diabetic macular edema ("DME") through late-stage studies and potential commercialization and advancing our other pipeline programs, 4D-175 for geographic atrophy, 4D-710 for CF lung disease, and 4D-725 for A1AT lung disease primarily through external funding including strategic partnerships. We believe we are well positioned to discover, develop, manufacture and if approved, commercialize targeted genetic medicines with the potential to transform the lives of patients suffering from debilitating diseases.

Our lead product candidate 4D-150 utilizes our proprietary R100 vector and a transgene encoding anti-VEGF biologics: aflibercept and an RNA interference (RNAi) approach targeting VEGF-C. The goal for our development and potential commercialization of 4D-150 is to transform the standard of care for large market retinal vascular diseases with a safe, in-office, and durable lifelong backbone therapy substantially reducing treatment burden and improving long-term vision outcomes. 4D-150 is initially being developed for the treatment of wet AMD and DME.

In March 2025, we initiated 4FRONT-1, our first Phase 3 trial of 4D-150 in wet AMD. Subsequently in February 2026, we announced enrollment completion within an approximately 11-month period, ahead of initial projections, with the clinical trial overenrolled and expected to exceed 500 patients randomized, reflecting strong interest from investigators and patients. We anticipate topline data with the 52-week primary endpoint in the first half of 2027.

Additionally, 4FRONT-2, our second Phase 3 trial of 4D-150 in wet AMD, was initiated in June 2025. 4FRONT-2 is a global clinical trial and is enrolling both treatment-naïve and recently diagnosed, treatment-experienced patients. We expect 52-week topline data for 4FRONT-2 in the second half of 2027.

In November 2025, we announced positive long-term interim results from the ongoing 4D-150 PRISM Phase 1/2 clinical trial in wet AMD. 4D-150 demonstrated consistent and durable benefit across all three patient cohorts as evidenced by maintenance of visual acuity, control of retinal anatomy and reduction of treatment burden at all time points with 1.5 to 2 years of follow-up. In addition, a consistent dose response was observed between 3E10 vg/eye, the selected Phase 3 dose, and the lower dose of 1E10 vg/eye. The Phase 3 dose achieved clinically meaningful reductions in treatment burden. No new cases of intraocular inflammation were reported during this follow-up period with up to approximately 3.5 years of follow-up.

In July 2025, we presented positive 60-week results from the 4D-150 SPECTRA clinical trial in DME where 4D-150 continued to be well tolerated with no intraocular inflammation observed at any timepoint or dose level. In addition, 4D-150 demonstrated durable and dose-dependent clinical activity with sustained gains in visual acuity and anatomic control between 3E10 vg/eye, the selected Phase 3 dose, and lower doses. The Phase 3 dose achieved clinically meaningful 78% reduction in treatment

burden vs. projected on-label aflibercept 2mg Q8W. The FDA and EMA are aligned on a proposed single Phase 3 clinical trial being acceptable for possible future licensure for 4D-150 in DME.

In October 2025, we entered into a Collaboration and License Agreement with Otsuka Pharmaceutical Co., Ltd. (the “Otsuka Collaboration and License Agreement”), pursuant to which we granted Otsuka exclusive rights to develop and commercialize 4D-150 for retinal vascular diseases, including wet AMD and DME, in Japan, China, Australia, and other APAC markets. Otsuka has agreed to lead all regulatory and commercialization activities in its licensed territories. We have agreed to continue to lead all Phase 3 clinical activity globally, including within the APAC region. Otsuka made an upfront cash payment of $85 million and agreed to provide certain cost sharing for global development activities. In addition, we are eligible for up to $335.5 million in potential regulatory and commercial milestone payments and tiered double-digit royalties depending on net sales in Otsuka’s licensed territories. We retain full development and commercialization rights for 4D-150 outside the APAC region, including the United States, Latin America, and Europe.

Our other pipeline programs include 4D-710, which we believe is the first known genetic medicine to demonstrate successful delivery and durable expression of the cystic fibrosis transmembrane conductance regulator (“CFTR”) transgene in the lungs of people with cystic fibrosis ("CF") and is currently in Phase 2 development. We believe these results will translate into durable clinical improvements in people with CF, including improved lung function and quality of life. In October 2025, we announced a funding agreement with the Cystic Fibrosis Foundation ("CFF") to provide up to $11 million in additional funding, including $7.5 million in an initial tranche, which was completed in October 2025. The proceeds of this funding agreement enabled the start of the Phase 2 stage of the AEROW clinical trial, redosing, and Phase 3 readiness activities.

We have funded our operations primarily through the sale and issuance of equity securities and to a lesser extent from cash received pursuant to our collaboration and license agreements.

Our net losses were $140.1 million and $160.9 million for the years ended December 31, 2025 and 2024, respectively. As of December 31, 2025, we had an accumulated deficit of $716.3 million. We do not expect positive cash flows from operations in the foreseeable future. Our net losses may fluctuate significantly from quarter-to-quarter and year-to-year, depending on the timing of our clinical trials and our expenditures on other research and development activities.

We do not have any products approved for sale and have not generated any revenue from product sales since our inception. Our ability to generate product revenue will depend on the successful development, regulatory approval and eventual commercialization of one or more of our product candidates, if approved.

We will require substantial additional funding to support our continuing operations and further the development of our product candidates. Until such time as we can generate significant revenue from product sales, if ever, we expect to finance our operations through the sale of equity, debt financings, or other capital sources, which could include income from collaborations, strategic partnerships, or other strategic arrangements, for the foreseeable future. Adequate funding may not be available when needed or on terms acceptable to us, or at all. Our ability to raise additional funds may be adversely impacted by potential worsening global economic conditions and the recent disruptions to, and volatility in, the credit and financial markets in the United States and worldwide resulting from conflicts in the Middle East, the lingering impact of the COVID-19 pandemic, the war in Ukraine, rising interest rates, tariffs, inflation, government shutdowns and otherwise. If we fail to obtain necessary capital when needed on acceptable terms, or at all, it could force us to delay, limit, reduce or terminate our product development programs, commercialization efforts or other operations. Insufficient liquidity may also require us to relinquish rights to product candidates at an earlier stage of development or on less favorable terms than we would otherwise choose. We cannot assure you that we will ever be profitable or generate positive cash flow from operating activities.

Restructuring and Other Charges

On July 2, 2025, we announced a workforce reduction of approximately 25% of current and planned roles, primarily in the areas supporting early-stage research and development and support functions following a strategic pipeline prioritization to focus on the development of 4D-150 and 4D-710. In connection with the workforce reduction, the Company recorded total expense of $3.2 million including severance, benefits and related termination costs during the year ended December 31, 2025. There are no future payments in connection with the workforce reduction.

Components of Results of Operations

Revenue

Our revenue to date has been generated through payments from our collaboration and license agreements, primarily from upfront and milestone payments and expense reimbursement. We have not generated any revenue from the sale of approved products and do not expect to do so for the foreseeable future.

In October 2025, we entered into the Otsuka Collaboration and License Agreement where we granted Otsuka exclusive rights to develop and commercialize 4D-150 for retinal vascular diseases, including wet AMD and DME, in Japan, China, Australia, and other Asia-Pacific markets. Otsuka made an upfront cash payment of $85 million which we recognized as revenue during the fourth quarter of 2025, and agreed to provide certain cost sharing for global development activities.

In August 2019, we amended our agreement with uniQure (the "Amended uniQure Agreement") and entered into a separate new collaboration and license agreement with uniQure (the "Second uniQure Agreement"). Neither party was required to pay monetary consideration in connection with the amendment or new agreement. We determined the incremental transaction price of the amendment and new agreement to be $5.1 million and recorded the amount as deferred revenue in August 2019. We began recognizing revenue related to uniQure in 2020 and recognized the remaining revenue under the agreement during the third quarter of 2023. We recognized immaterial revenue during the year ended December 31, 2023 related to this agreement. See Note 6, Research and Collaboration Agreements, to our financial statements included elsewhere in this report for further discussion regarding the accounting treatment of this agreement. The Amended uniQure Agreement and the Second uniQure Agreement were terminated by mutual agreement in November 2025. We did not incur any charges related to the termination of the uniQure Agreement.

Future collaboration and license revenue is highly dependent on the successful development and commercialization of products by our collaboration partners, which is uncertain, and revenue may fluctuate significantly from period to period. Additionally, we may never receive the consideration from our license agreements that is contemplated for option fees, development and sales-based milestone payments or royalties on sales of licensed products, given the contingent nature of these payments.

Operating Expenses

Research and Development

Our research and development expenses primarily consist of costs incurred for the discovery and preclinical and clinical development of our product candidates. These expenses include salaries and personnel-related costs, including stock-based compensation of our clinical, medical, chemistry, manufacturing and controls and scientific personnel performing research and development activities; laboratory supplies; research materials; fees paid to CROs to execute preclinical studies and clinical trials; fees paid to CDMOs to manufacture materials for preclinical studies and clinical trials; fees related to obtaining technology licenses; consulting costs; costs related to seeking regulatory approval of our

product candidates; and allocated facility-related costs, information technology costs, depreciation expense, and other overhead.

We expense all research and development costs in the periods in which they are incurred. We have entered into various agreements with CROs and CDMOs. Costs of certain activities are recognized based on an evaluation of the progress to completion of specific tasks. Payments made prior to the receipt of goods or services that will be used or rendered for future research and development activities are deferred and capitalized as prepaid expenses and other current assets on our balance sheet. The capitalized amounts are recognized as expense as the goods are delivered or the related services are performed.

We do not allocate our costs by product candidate, as a significant amount of research and development expenses includes internal costs, such as salary and other personnel-related expenses, laboratory supplies and allocated overhead, and external costs, such as fees paid to third parties to conduct research and development activities on our behalf, none of which are tracked by product candidate. In particular, with respect to internal costs, several of our departments support multiple product candidate research and development programs and, therefore, the costs cannot be allocated to a particular product candidate or development program.

At this time, we cannot reasonably estimate or know the nature, timing or estimated costs of the efforts that will be necessary to complete the development of, and obtain regulatory approval for, any of our product candidates. However, we expect our overall research and development expenses to increase in the near term primarily for 4D-150 Phase 3 trials in wet AMD and DME. The process of conducting the necessary clinical development to obtain regulatory approval is costly and time-consuming, and the successful development of our product candidates is highly uncertain. See the section titled “Risk Factors” for additional risks regarding regulatory development and approval.

General and Administrative

Our general and administrative expenses consist primarily of personnel-related expenses, including salaries, employee benefit costs and stock-based compensation expense for our personnel in executive, finance and accounting, legal, human resources, business development, and other administrative functions. General and administrative expenses also include professional fees for legal, patent, consulting, accounting and tax services, allocated overhead, including rent, equipment, depreciation, information technology costs and utilities, and other general operating expenses not otherwise classified as research and development expenses.

Other Income, Net

Our other income, net primarily consists of interest income earned on our cash equivalents and marketable securities and adjustments for the change in the fair value of our derivative liability which must be remeasured at each reporting date.

Results of Operations

Comparison of the Years Ended December 31, 2025 and 2024

The following table summarizes our results of operations for the periods indicated (dollars in thousands):

	Year Ended December 31,			
	2025	2024	$ Change	% Change
Revenue				
Collaboration and license revenue	$ 85,209	$ 37	$ 85,172	*
Operating Expenses:				
Research and development	195,696	141,299	54,397	38%
General and administrative	49,060	46,579	2,481	5%
Total operating expenses	244,756	187,878	56,878	30%
Loss from operations	(159,547)	(187,841)	28,294	(15)%
Other Income, Net	19,438	26,973	(7,535)	(28)%
Net loss	$ (140,109)	$ (160,868)	$ 20,759	(13)%

* not meaningful

Revenue

Revenue for the year ended December 31, 2025 increased by $85.2 million from the year ended December 31, 2024. The increase in revenue was primarily due to the upfront fees received from the Otsuka Collaboration and License Agreement in October 2025.

Research and Development Expenses

The following table provides a breakout of research and development expenses for the periods indicated (dollars in thousands):

	Year Ended December 31,			
	2025	2024	$ Change	% Change
Research and development trials and consumables expenses	$ 100,220	$ 64,757	$ 35,463	55%
Payroll and personnel expenses	67,345	57,383	9,962	17%
Facilities and other research and development expenses	28,131	19,159	8,972	47%
Total research and development expenses	$ 195,696	$ 141,299	$ 54,397	38%

Research and development expenses for the year ended December 31, 2025 increased by $54.4 million, or 38%, from the year ended December 31, 2024. The increase was due to the following:

- a $35.5 million increase in research and development trials and consumables expenses mainly due to increased clinical trial activity for our product candidates, primarily 4D-150;
- a $10.0 million increase in payroll and personnel expenses primarily due to increased headcount of research and development personnel and one-time severance costs; and
- an $8.9 million increase in facilities and other research and development expenses primarily due to higher rent and increased clinical trial activity for our product candidates.

General and Administrative Expenses

General and administrative expenses for the year ended December 31, 2025 increased by $2.5 million, or 5%, from the year ended December 31, 2024. The increase was primarily due to an increase in legal and consulting services.

Other Income, Net

Other income, net, decreased by $7.5 million, or 28%, from the year ended December 31, 2024 to the year ended December 31, 2025. The decrease was due to a reduction in invested balances from transfers out of investment accounts to fund operating expenses and lower market yields on our cash equivalents and marketable securities.

Liquidity and Capital Resources

Sources of Liquidity

As of December 31, 2025, we had cash, cash equivalents and marketable securities of $514.0 million. We have funded our operations primarily through the sale and issuance of our equity securities, including Follow-on Offerings and our “at-the-market” offering program, and to a lesser extent from cash received pursuant to our collaboration and license agreements. Our recent sources of liquidity include the following transactions:

Follow-on Offerings

In November 2025, we completed an underwritten offering (the "2025 Offering") in which 8,385,809 shares of our common stock were sold at an offering price of $10.51 per share, as well as pre-funded warrants to purchase 1,128,949 shares of our common stock at an offering price of $10.5099 per underlying share. The net proceeds from the 2025 Offering were approximately $93.3 million, after deducting the underwriting discounts and commissions and other offering expenses.

In February 2024, we completed the 2024 Offering in which 6,586,015 shares of our common stock were sold at an offering price of $29.50 per share, as well as pre-funded warrants to purchase 3,583,476 shares of our common stock at an offering price of $29.4999 per underlying share. The net proceeds from the 2024 Offering were $281.2 million, after deducting underwriting discounts and commissions and other offering expenses. We also granted the underwriters the option to purchase up to 1,525,423 additional shares of common stock in connection with the offering. In March 2024, the underwriters exercised their option and purchased 1,259,299 additional shares of common stock resulting in net proceeds of $34.9 million, after deducting underwriting discounts and commissions.

In May 2023, we completed the 2023 Offering in which 8,625,000 shares of our common stock were sold at an offering price of $16.00 per share. The net proceeds from the 2023 Offering were $129.2 million after deducting underwriting discounts and commissions and offering expenses.

At-the-Market Offering Program

In June 2024, we entered into a Sales Agreement (the “Leerink Sales Agreement”) with Leerink Partners LLC (“Leerink”) as sales agent to sell shares of our common stock, from time to time, with aggregate gross sales proceeds of up to $250.0 million pursuant to a Registration Statement on Form S-3 that we filed with the SEC in February 2024 as an “at-the-market” offering under the Securities Act. For the year ended December 31, 2025, 1,175,000 shares of the Company's common stock were sold pursuant to the Leerink Sales Agreement for net proceeds to the Company of $9.6 million, after deducting issuance costs.

In March 2022, we also entered into an Open Market Sales Agreement (the "Sales Agreement") with Jefferies LLC as sales agent to sell shares of our common stock, from time to time, with aggregate gross sales proceeds of up to $100.0 million pursuant to the S-3 Registration Statement as an "at-the-market" offering under the Securities Act (the "2022 ATM Offering Program"). On May 31, 2024, we terminated the Sales Agreement and the 2022 ATM Offering Program pursuant to the terms of the Sales Agreement. At termination, 1,684,550 shares of our common stock had been sold pursuant to the Sales Agreement for net proceeds to us of $34.4 million, after deducting issuance costs.

Collaboration and License Agreements

In October 2025, we entered into a Collaboration and License Agreement with Otsuka where we granted Otsuka exclusive rights to develop and commercialize 4D-150 for retinal vascular diseases, including wet AMD and DME, in Japan, China, Australia, and other Asia-Pacific markets. Otsuka made an upfront cash payment of $85 million and agreed to provide certain cost sharing for global development activities.

In July 2023, we entered into the License Agreement with AGT where we provided our 4D vector technology to AGT to deliver AGT's genetic payloads for the treatment of rare monogenic diseases. As partial consideration for the rights and licenses granted to AGT under the License Agreement, we received an upfront payment of $20.0 million.

Future Funding Requirements

We have experienced recurring net losses and had an accumulated deficit of $716.3 million at December 31, 2025. Our transition to profitability is dependent upon the successful development, approval and commercialization of our product candidates and those of our collaboration partners and achieving a level of revenue adequate to support our cost structure. We expect to continue to incur losses for the foreseeable future.

We expect that our overall research and development and general and administrative expenses will increase. As a result, we will need significant additional capital to fund our operations, which we may obtain through one or more equity offerings, debt financings or other third-party funding, the Otsuka Collaboration and License Agreement, and additional potential strategic alliances and licensing or collaboration arrangements.

Because of the numerous risks and uncertainties associated with the development and commercialization of gene therapy product candidates, we are unable to estimate the amount of increased capital we will need to raise to support our operations and the outlays and operating expenditures necessary to complete the development of our product candidates and build additional manufacturing capacity, and we may use our available capital resources sooner than we currently expect.

Our future capital requirements will depend on many factors, including:

- the progress of our current and future product candidates through preclinical and clinical development;
- potential delays in our preclinical studies and clinical trials, whether current or planned;
- working with our contract manufacturers to scale up the manufacturing processes for our product candidates;
- continuing our research and discovery activities;
- continuing the development of our Therapeutic Vector Evolution platform;
- initiating and conducting additional preclinical, clinical or other studies for our product candidates;

- changing or adding additional contract manufacturers or suppliers;
- seeking regulatory approvals and marketing authorizations for our product candidates;
- establishing sales, marketing and distribution infrastructure to commercialize any products for which we obtain approval;
- acquiring or in-licensing product candidates, intellectual property and technologies;
- making milestone, royalty or other payments due under any current or future collaboration or license agreements;
- receiving milestone, royalty or other payments under any current or future collaboration or license agreements;
- obtaining, maintaining, expanding, protecting and enforcing our intellectual property portfolio;
- attracting, hiring and retaining qualified personnel;
- potential delays or other issues related to our operations;
- meeting the requirements and demands of being a public company;
- defending against any product liability claims or other lawsuits related to our products; and
- the lingering impact of the COVID-19 pandemic and adverse macroeconomic conditions such as, but not limited to, higher inflation and increased interest rates, each of which may exacerbate the magnitude of the factors discussed above.

We believe that our existing cash, cash equivalents and marketable securities will allow us to fund our planned operations for at least one year from the date of the issuance of the financial statements included in this report.

We have based our estimates as to how long we expect we will be able to fund our operations on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect, in which case we would be required to obtain additional financing sooner than currently projected, which may not be available to us on acceptable terms, or at all. Our failure to raise capital as and when needed would have a negative impact on our financial condition and our ability to pursue our business strategy. See the section titled “Risk Factors” for additional risks associated with our substantial capital requirements.

We have limited committed external sources of funds. Accordingly, we will be required to obtain further funding through public or private equity offerings, debt financings, collaborations and licensing arrangements or other sources to complete the clinical development for the product candidates for treatment of wet AMD, DME, geographic atrophy, cystic fibrosis lung disease, alpha-1 antitrypsin deficiency lung disease or any other indication we may pursue. If we raise additional funds by issuing equity securities, our stockholders may experience dilution. Any future debt financing into which we enter would result in fixed payment obligations and may involve agreements that include grants of security interests on our assets and restrictive covenants that limit our ability to take specific actions, such as incurring additional debt, making capital expenditures, granting liens over our assets, redeeming stock or declaring dividends, that could adversely impact our ability to conduct our business. Any debt financing or additional equity that we raise may contain terms that could adversely affect our common stockholders. Further, additional funds may not be available when we need them, on terms that are acceptable to us, or at all. Our ability to raise additional capital may be adversely impacted by potential worsening global economic conditions and the recent disruptions to and volatility in the credit and financial markets in the United States and worldwide resulting from the war in Ukraine, conflicts in the Middle East, any expansion of these conflicts, rising interest rates and inflation, natural disasters and pandemics.

If we are unable to obtain additional funding, we expect to delay, reduce or eliminate some or all of our research and development programs, product portfolio expansion or investment in manufacturing

capabilities, which could adversely affect our business. If we raise additional funds through collaborations or marketing, distribution or licensing arrangements with third parties, we may have to relinquish valuable rights to future revenue streams or product candidates or grant licenses on terms that may not be favorable to us.

Summary Statement of Cash Flows

The following is a summary of cash flows for the periods indicated below (in thousands):

	Year Ended December 31,	
	2025	2024
Net cash used in operating activities	$ (109,082)	$ (134,585)
Net cash used in investing activities	(92,973)	(302,437)
Net cash provided by financing activities	112,960	337,250
Net decrease in cash and cash equivalents	$ (89,095)	$ (99,772)

Net Cash Used in Operating Activities

Net cash used in operating activities was $109.1 million for the year ended December 31, 2025. This was primarily due to the net loss of $140.1 million partially offset by a change of $24.8 million in noncash charges and by a net change of $6.2 million in our operating assets and liabilities. The noncash charges primarily consisted of stock-based compensation expense of $22.0 million, depreciation and amortization of $4.7 million and amortization of operating lease right-of-use assets of $2.9 million, partially offset by accretion of discount on marketable securities of $4.7 million and $0.1 million in change in fair value of derivative liability. The change in operating assets and liabilities was primarily due to an $8.1 million increase in accrued and other liabilities, a $6.8 million increase in accounts payable, offset by a $3.2 million decrease in operating lease liabilities, a $0.2 decrease in deferred revenue, a $0.4 million increase in prepaid expenses and other current assets and a $4.9 million increase in other assets.

Net cash used in operating activities was $134.6 million for the year ended December 31, 2024. This was primarily due to the net loss of $160.9 million partially offset by a change of $25.7 million in noncash charges and by a net change of $0.5 million in our operating assets and liabilities. The noncash charges primarily consisted of stock-based compensation expense of $26.1 million, depreciation and amortization of $4.7 million and amortization of operating lease right-of-use assets of $2.1 million, partially offset by accretion of discount on marketable securities of $7.2 million. The change in operating assets and liabilities was primarily due to a $6.5 million increase in accrued and other liabilities, a $0.9 million increase in accounts payable and $0.1 million increase in deferred revenue, offset by a $1.7 million decrease in operating lease liabilities, a $1.7 million increase in prepaid expenses and other current assets and a $3.6 million increase in other assets.

Net Cash Used in Investing Activities

Net cash used in investing activities was $93.0 million for the year ended December 31, 2025. This was due to purchases of marketable securities of $442.8 million and purchases of property and equipment of $0.5 million, offset by maturities of marketable securities of $350.4 million.

Net cash used in investing activities was $302.4 million for the year ended December 31, 2024. This was due to purchases of marketable securities of $467.6 million and purchases of property and equipment of $3.8 million, offset by maturities of marketable securities of $169.0 million.

Net Cash Provided by Financing Activities

Net cash provided by financing activities was $113.0 million for the year ended December 31, 2025. This was due to proceeds from the issuance of common stock upon underwritten offering, net of issuance costs, of $93.5 million, proceeds from the issuance of common stock from the ATM Offering Program of $9.7 million, proceeds from the issuance of common stock under a stock purchase agreement of $7.5 million, proceeds from the issuance of common stock from purchases from the Company's 2020 Employee Stock Purchase Plan ("ESPP") of $1.3 million, and proceeds from the issuance of common stock from the exercise of stock options and warrants of $1.0 million.

Net cash provided by financing activities was $337.3 million for the year ended December 31, 2024. This was due to proceeds from the issuance of common stock upon public offering, net of issuance costs, of $316.1 million, proceeds from the issuance of common stock from the 2022 ATM Offering Program of $15.3 million, proceeds from the issuance of common stock from the exercise of stock options and warrants of $4.6 million and proceeds from the issuance of common stock from purchases from the ESPP of $1.3 million.

Contractual Obligations, Commitments and Contingencies

Our commitments include obligations under vendor contracts to provide research services and other purchase commitments with our vendors. In the normal course of business, we enter into services agreements with contract research organizations, contract manufacturing organizations and other third parties. Generally, these agreements provide for termination upon notice, with specified amounts due upon termination based on the timing of termination and the terms of the agreement. The actual amounts and timing of payments under these agreements are uncertain and contingent upon the initiation and completion of the services to be provided. These amounts are not fixed and determinable.

As of December 31, 2025, our principal commitments consisted of obligations under our operating lease for our headquarters. Please see Note 8, Commitments and Contingencies, to our financial statements included elsewhere in this report.

Critical Accounting Policies and Significant Judgments and Estimates

Our financial statements have been prepared in accordance with generally accepted accounting principles in the United States. The preparation of our financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of our financial statements, as well as the reported revenue and expenses during the reported periods. We evaluate these estimates and assumptions on an ongoing basis. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

Our significant accounting policies are described in Note 2, Summary of Significant Accounting Policies, to our financial statements included elsewhere in this report. We believe the following accounting policies are critical to the process of making significant judgments and estimates in the preparation of our financial statements and understanding and evaluating our reported financial results.

Revenue Recognition

We determine revenue recognition for arrangements within the scope of Accounting Standards Update 2014-09, Revenue from Contracts with Customers (Topic 606) ("ASC 606") by performing the following five steps: (i) assessment whether a contract with a customer exists; (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 based on estimated standalone selling prices; and (v) recognition of revenue when (or as) we satisfy each performance obligation.

Our revenue is primarily derived through its license, research, development and commercialization agreements. The terms of these types of agreements may include (i) licenses to our technology, (ii) research and development services, and (iii) supplies of clinical and commercial materials. A performance obligation is a promise in a contract to transfer a distinct good or service to the customer, and is the unit of account in ASC 606. Significant judgment is required to determine whether the individual promised goods or services are distinct. Items are considered distinct if the customer can benefit from them on their own, or together with other readily available resources, and if they are separately identifiable from other items in the contract.

Payments to us under these arrangements typically include one or more of the following: nonrefundable upfront and license fees, cost-sharing and other forms of research funding, milestone and other contingent payments to us for the achievement of defined collaboration objectives and certain preclinical, clinical, regulatory and sales-based events, as well as royalties on sales of any commercialized products.

We recognize as revenue sales-based royalties and milestone payments at the later of (i) when the related sales occur, or (ii) when the performance obligation to which the royalty has been allocated has been satisfied.

Other variable amounts, such as cost-sharing and development and regulatory milestones, are included in the transaction price to the extent it is probable a significant reversal of cumulative revenue recognized will not occur when the associated uncertainties are resolved. We use the most likely or expected value amount methods as appropriate to estimate variable consideration.

At the end of each reporting period, we re-evaluate the estimated variable consideration included in the transaction price and any related constraint, and if necessary, adjusts its estimate of the overall transaction price.

We allocate the total transaction price to each performance obligation based on the estimated standalone selling prices. Variable consideration is allocated to the specific performance obligations if it is triggered by our performance or the outcomes from such performance, and if such allocation meets the allocation objective of recognizing revenue in amounts of consideration to which we expect to be entitled in exchange for transferring its promised goods or services to the customer.

We recognize revenue when, or as, the performance obligation is satisfied. Performance obligations recognized at a point in time, such as distinct licenses our intellectual property, are recognized when control transfers, including commencement of the license term. Performance obligations recognized over time, such as research and development services, are recognized using an appropriate measure of progress, such as total cost incurred.

We record accounts receivable when our right to consideration is unconditional, i.e. if and only passage of time is required before payment is due. Amounts collected or included in accounts receivable but not yet recognized in revenue are recorded as deferred revenues. Amounts recognized in revenue but not included in accounts receivable are recorded as contract assets.

Significant management judgment is required to determine the level of effort required under an arrangement and the period over which we expect to complete our performance obligations under the arrangement. Changes in these estimates can have a material effect on revenue recognized.

Accrued Clinical Research Organization Costs

We estimate our accrued clinical research organization costs as of each balance sheet date. This process involves reviewing contracts and purchase orders with service providers, identifying services that have been performed on our behalf and estimating the level of service performed, the expected remaining period of performance and the associated expenses incurred for the service when we have not yet been invoiced or otherwise notified of actual cost. Depending on the timing of payments to the service providers and the estimated expenses incurred, we may record net prepaid or accrued clinical research organization expenses relating to these costs.

Examples of estimated accrued research and development expenses include fees paid to:

- CROs in connection with preclinical development and clinical studies; and
- other vendors related to process development and manufacturing of materials for use in preclinical development and clinical studies.

Our understanding of the status and timing of services performed relative to the actual status and timing may vary and may result in us reporting changes in estimates in any particular period. To date, there have been no material differences from our estimates to the amounts actually incurred.

Stock-Based Compensation Expense

We use a fair value-based method to account for all stock-based compensation arrangements with employees and nonemployees including stock options and stock awards. Our determination of the fair value of stock options on the date of grant utilizes the Black-Scholes option pricing model.

The fair value of the option granted is recognized on a straight-line basis over the period during which an optionee is required to provide services in exchange for the option award, known as the requisite service period, which usually is the vesting period. Prior to January 1, 2020, the stock-based compensation expense for nonemployees was subject to remeasurement until the related vesting conditions were met. Effective January 1, 2020, the measurement date for nonemployee awards is the date of grant without changes in the fair value of the award. We account for forfeitures as they occur for both employees and nonemployees.

Estimates of the fair value of equity awards as of the grant date using valuation models such as the Black-Scholes option pricing model are affected by assumptions with a number of complex variables.

Changes in the following assumptions can materially affect the estimate of fair value and ultimately how much stock-based compensation expense is recognized; and the resulting change in fair value, if any, is recognized in our statements of operations during the period the related services are rendered. These inputs are subjective and generally require significant analysis and judgment to develop:

- *Expected Term*—The expected term for employee stock options is calculated using the simplified method as we do not have sufficient historical information to provide a basis for estimate. The simplified method is based on the average of the vesting tranches and the contractual life of each grant.
- *Expected Volatility*—For all stock options granted to date, the expected volatility was estimated based on a study of publicly traded industry peer companies as we did not have sufficient trading history for our common stock. We selected the peer group based on similarities in industry, stage of development, size and financial leverage with our principal business operations. For each grant, we measured historical volatility over a period equivalent to the expected term.
- *Risk-Free Interest Rate*—The risk-free interest rate is based on the yield available on U.S. Treasury zero-coupon issues whose term is similar in duration to the expected term of the respective stock option.

- *Expected Dividend Yield*—We have not paid and do not currently anticipate paying any dividends on our common stock. Accordingly, we have estimated the dividend yield to be zero.

As of December 31, 2025, the unrecognized stock-based compensation expense related to stock options and RSUs was $34.2 million and is expected to be recognized as expense over a weighted-average period of approximately 1.7 years. The intrinsic value of all outstanding stock options as of December 31, 2025 was approximately $4.6 million, of which $1.0 million related to vested stock options and $3.6 million related to unvested stock options.

Income Taxes

We account for income taxes under the asset and liability method, which requires, among other things, that deferred income taxes be provided for temporary differences between the financial statement reporting and tax basis of our assets and liabilities. In addition, deferred tax assets are recorded for the future benefit of utilizing net operating losses and research and development credit carryforwards and are measured using the enacted tax rates and laws that will be in effect when such items are expected to reverse. A valuation allowance is provided against deferred tax assets unless it is more likely than not that they will be realized.

We account for uncertain tax positions by assessing all material positions taken in any assessment or challenge by relevant taxing authorities. Assessing an uncertain tax position begins with the initial determination of the position's sustainability and is measured at the largest amount of benefit that is greater than fifty percent likely of being realized upon ultimate settlement. Our policy is to recognize interest and penalties related to the underpayment of income taxes as a component of income tax expense or benefit. To date, there have been no interest or penalties charged in relation to the unrecognized tax benefits.

NOLs and tax credit carryforwards are subject to review and possible adjustment by the Internal Revenue Service and may become subject to an annual limitation in the event of certain cumulative changes in the ownership interest of significant stockholders over a three-year period in excess of 50% as defined under Sections 382 and 383 in the Internal Revenue Code, which could limit the amount of tax attributes that can be utilized annually to offset future taxable income or tax liabilities.

Off-Balance Sheet Arrangements

Since our inception, we have not engaged in any off-balance sheet arrangements as defined in the rules and regulations of the SEC.

Recent Accounting Pronouncements

See Note 2, Summary of Significant Accounting Policies, to our financial statements included elsewhere in this report for information.

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

Interest Rate Sensitivity and Effects of Inflation

The market risk inherent in our financial instruments and in our financial position represents the potential loss arising from adverse changes in interest rates. As of December 31, 2025, we had cash, cash equivalents and marketable securities of $514.0 million, consisting of bank deposits, interest-bearing money market funds, and marketable securities, for which the fair value would be affected by changes in the general level of U.S. interest rates. However, due to the short-term maturities of our cash equivalents and marketable securities, an immediate 10% change in interest rates would not have a material effect on the fair value of our cash equivalents or marketable securities.

We do not believe that inflation or interest rate changes have had a significant impact on our results of operations for any periods presented herein.

Item 8. Financial Statements and Supplementary Data.

The financial statements required by this item are set forth beginning on page F-1 of this Annual Report on Form 10-K.

4D Molecular Therapeutics, Inc.

Index to Financial Statements

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

Management's Evaluation of our Disclosure Controls and Procedures and Internal Control Over Financial Reporting

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 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 officers, 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, evaluated the effectiveness of our disclosure controls and procedures at 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.

Management's Annual Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f). Our internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to

future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Management has assessed the effectiveness of our internal control over financial reporting based on the framework set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control-Integrated Framework (2013 framework). Based on our evaluation, management has concluded that our internal control over financial reporting was effective as of December 31, 2025.

This Annual Report on Form 10-K does not include an attestation report of our independent registered public accounting firm on our internal control over financial reporting because we are not an accelerated filer.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during our most recent fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

During the fiscal quarter ended December 31, 2025, none of our directors or officers (as defined in Section 16 of the Securities Exchange Act of 1934, as amended) adopted or terminated any contract, instruction or written plan for the purchase or sale of our securities that was intended to satisfy the affirmative defense conditions of Rule 10b5-1(c) or any “non-Rule 10b5-1 trading arrangement,” as defined in Item 408(a) of Regulation S-K.

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

Not Applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by this item will be contained in our definitive proxy statement to be filed with the SEC in connection with the Annual Meeting within 120 days after December 31, 2025 (the "Proxy Statement") and is incorporated in this Annual Report on Form 10-K by reference.

We have adopted insider trading policies and procedures governing the purchase, sale, and other dispositions of our securities by directors, officers and employees that are designed to promote compliance with insider trading laws, rules and regulations and applicable Nasdaq listing standards, as well as procedures designed to further the foregoing purposes. See Exhibit 19.1 of our Annual Report on Form 10-K for the year ended December 31, 2024 for our insider trading policy.

Item 11. Executive Compensation.

The information required by this item will be contained in the Proxy Statement and is incorporated in this Annual Report on Form 10-K by reference.

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

The information required by this item will be contained in the Proxy Statement and is incorporated in this Annual Report on Form 10-K by reference.

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

The information required by this item will be contained in the Proxy Statement and is incorporated in this Annual Report on Form 10-K by reference.

Item 14. Principal Accounting Fees and Services.

The information required by this item will be contained in the Proxy Statement and is incorporated in this Annual Report on Form 10-K by reference.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

(a) The financial statements schedules and exhibits filed as part of this Annual Report on Form 10-K are as follows:

(1) Financial Statements;

Reference is made to the financial statements included in Item 8 of Part II hereof.

(2) Financial Statement Schedules

All financial statement schedules are omitted because they are not required or the required information is included in the financial statements or notes thereto.

(3) Exhibits

The exhibits required to be filed as part of this report are listed in the Exhibit List attached hereto and are incorporated herein by reference.

Exhibit Index

Exhibit Number	Exhibit Description	Incorporated by Reference			Filed Herewith
		Form	Date	Number	
3.1	Amended and Restated Certificate of Incorporation, as currently in effect.	8-K	12/15/20	3.1	
3.2	Amended and Restated Bylaws, as currently in effect.	8-K	10/02/25	3.1	
4.1	Description of Securities of the Registrant.				X
4.2	Form of Common Stock Certificate.	S-1/A	12/7/20	4.2	
4.3	Form of Pre-Funded Warrant issued in conjunction with February 2024 offering.	8-K	2/9/24	4.1	
4.4	Form of Pre-Funded Warrant issued in conjunction with November 2024 exchange.	10-Q	11/13/24	4.4	
4.5	Form of Pre-Funded Warrant issued in conjunction with December 2024 exchange.	8-K	12/11/24	4.1	
4.6	Form of Pre-Funded Warrant issued in conjunction with November 2025 Offering.	8-K	11/7/25	4.1	
4.7	Form of Pre-Funded Warrant issued in conjunction with January 2026 Exchange.	8-K	1/26/26	4.1	
10.1(a)#	2015 Equity Incentive Plan.	S-1	11/17/20	10.1(a)	
10.1(b)#	Form of Stock Option Agreement under 2015 Equity Incentive Plan.	S-1	11/17/20	10.1(b)	
10.2(a)#	2020 Incentive Award Plan.	S-8	12/15/20	99.2(a)	
10.2(b)#	Form of Stock Option Grant Notice and Stock Option Agreement under the 2020 Incentive Award Plan.	S-1/A	12/7/20	10.2(b)	
10.2(c)#	Form of Restricted Stock Award Grant Notice and Restricted Stock Award Agreement under the 2020 Incentive Award Plan.	S-1/A	12/7/20	10.2(c)	
10.2(d)#	Form of Restricted Stock Unit Award Grant Notice and Restricted Stock Unit Award Agreement under the 2020 Incentive Award Plan.	S-1/A	12/7/20	10.2(d)	
10.3#	2020 Employee Stock Purchase Plan.	S-8	12/15/20	99.3	
10.4†	Form of Indemnification Agreement for directors and officers.	S-1/A	12/7/20	10.4	
10.5†	Exclusive License and Bailment Agreement, dated December 19, 2013, between the Registrant and The Regents of the University of California.	S-1/A	12/7/20	10.8	
10.6†	Exclusive License and Bailment Agreement, dated December 19, 2013, between the Registrant and The Regents of the University of California.	S-1/A	12/7/20	10.9	
10.7#	Offer Letter, dated March 20, 2015 between David Kirn, M.D. and the Registrant.	S-1/A	12/7/20	10.10	
10.8#	Change in Control and Severance Agreement, dated September 22, 2021, by and between David Kirn and 4D Molecular Therapeutics, Inc.	8-K	9/24/21	10.1	
10.9#	Change in Control and Severance Agreement, dated September 22, 2021, by and between Fred Kamal and 4D Molecular Therapeutics, Inc.	10-Q	11/10/21	10.4	
10.10#	Restated Amended and Restated Non-Employee Director Compensation Policy.	10-Q	5/12/22	10.1	
10.11#	Offer Letter, dated September 4, 2023, between Uneek Mehra and the Registrant.	10-K	2/29/24	10.14	
10.12#	Change in Control and Severance Agreement, dated August 29, 2023, by and between Uneek Mehra and the Registrant.	10-K	2/29/24	10.15	

10.13#	Change in Control and Severance Agreement, dated September 22, 2021, by and between Scott Bizily and the Registrant.	10-K	2/29/24	10.16	
10.14#	Amended and Restated Change in Control and Severance Agreement, dated June 23, 2023 by and between Robert Kim and the Registrant.	10-K	2/29/24	10.17	
10.15#	2025 Employment Inducement Award Plan.	10-K	2/28/25	10.19	
10.16#	Amendment to 2025 Employment Inducement Award Plan.				X
10.17#	Form of Restricted Stock Unit Award Grant Notice and Restricted Stock Unit Award Agreement under the 2025 Employment Inducement Award Plan.	10-K	2/28/25	10.20	
10.18#	Form of Stock Option Grant Notice and Stock Option Agreement under the 2025 Employment Inducement Award Plan.	10-K	2/28/25	10.21	
10.19#	Offer Letter, dated May 24, 2024, between Ashoo Gupta and the Registrant.	10-Q	11/10/25	10.1	
10.20	Consulting Agreement, dated July 15, 2025, between Uneek Mehra and the Registrant.	10-Q	11/10/25	10.2	
10.21#	Offer Letter, dated November 3, 2025, between Kristian Humer and the Registrant.				X
10.22#	Change in Control and Severance Agreement, dated November 18, 2025, by and between Kristian Humer and the Registrant.				X
10.23	Transition Agreement with Fred Kamal, dated December 31, 2025, between Fred Kamal and the Registrant.				X
10.24†	Collaboration and License Agreement between the Registrant and Otsuka Pharmaceutical Co., Ltd. dated as of October 31, 2025.				X
19.1†	Insider Trading Compliance Policy, dated as of November 4, 2024.	10-K	2/28/25	19.1	
23.1	Consent of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm.				X
24.1	Power of Attorney (included on the signature page of this Form 10-K).				X
31.1	Certification of the 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.				X
31.2	Certification of the 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.				X
32.1*	Certifications of the 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.				X
97	Registrant's Policy for Recovery of Erroneously Awarded Compensation.	10-K	2/29/24	97	
101.INS	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because XBRL tags are embedded within the Inline XBRL document.				X
101.SCH	Inline XBRL Taxonomy Extension Schema with Embedded Linkbase Documents.				X
104	Cover Page Interactive Data File (embedded within the Inline XBRL document).				X

# Indicates management contract or compensatory plan.

† Certain confidential portions (indicated by brackets and asterisks) have been omitted from this exhibit.

* The certifications attached as Exhibit 32.1 that accompany this Annual Report on Form 10-K are deemed furnished and not filed with the Securities and Exchange Commission and are not to be incorporated by reference into any filing of 4D Molecular Therapeutics, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Annual Report on Form 10-K, irrespective of any general incorporation language contained in such filing.

Item 16. Form 10-K Summary

None.

SIGNATURES

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

4D Molecular Therapeutics, Inc.

Date: March 18, 2026

By: /s/ David Kirn

David Kirn, M.D.
President, Chief Executive Officer and Director
(Duly Authorized Officer and Principal Executive Officer)

Power of Attorney

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints David Kirn, M.D. and Kristian Humer, jointly and severally, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place, and stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming that all said attorneys-in-fact and agents, or his or their substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

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

Name	Title	Date
/s/ David Kirn **David Kirn, M.D.**	President, Chief Executive Officer and Director *(Principal Executive Officer)*	March 18, 2026
/s/ Kristian Humer **Kristian Humer**	Chief Financial Officer *(Principal Financial Officer)*	March 18, 2026
/s/ Ashoo Gupta **Ashoo Gupta**	Vice President, Finance and Controller *(Principal Accounting Officer)*	March 18, 2026
/s/ John F. Milligan **John F. Milligan, Ph.D.**	Executive Chairman	March 18, 2026
/s/ Jacob Chacko **Jacob Chacko, M.D., MBA**	Director	March 18, 2026
/s/ Susannah Gray **Susannah Gray, MBA**	Director	March 18, 2026
/s/ Nancy Miller-Rich **Nancy Miller-Rich**	Director	March 18, 2026
/s/ Glenn Sblendorio **Glenn Sblendorio**	Director	March 18, 2026

/s/ Charles P. Theuer **Charles P. Theuer, M.D., Ph.D.**	Director	March 18, 2026
/s/ Shawn Cline Tomasello **Shawn Cline Tomasello, MBA**	Director	March 18, 2026

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of 4D Molecular Therapeutics, Inc.

Opinion on the Financial Statements

We have audited the accompanying balance sheets of 4D Molecular Therapeutics, Inc. (the "Company") as of December 31, 2025 and 2024, and the related statements of operations, of comprehensive loss, of stockholders' equity and of cash flows for the years then ended, including the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2025 and 2024, and the results of its operations and its cash flows for the years then ended in conformity with accounting principles generally accepted in the United States of America.

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 of these financial statements in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits 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 Matters

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 (i) relates to accounts or disclosures that are material to the financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the 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 Clinical Research Organization Costs

As described in Notes 2 and 5 to the financial statements, the Company recorded $10.3 million in accrued clinical and preclinical study costs as of December 31, 2025, a majority of which relates to accrued clinical research organization (CRO) costs. Accrued CRO costs include direct costs, as well as costs associated with patient visits and site activations. These costs are estimated by management based on

the level of services performed, progress of the studies, including the phase or completion of events, and contracted costs. The estimated costs of research and development provided, but not yet invoiced by CROs, are included in accrued and other current liabilities on the balance sheet. If the actual timing of the performance of services or the level of effort varies from the original estimates, management will adjust the accrual accordingly. Estimating the accrued clinical research organization costs as of each balance sheet date requires the process of reviewing contracts and purchase orders with service providers, identifying services that have been performed on the Company's behalf and estimating the level of service performed, the expected remaining period of performance and the associated expenses incurred for the service when the Company has not yet been invoiced or notified of actual cost.

The principal considerations for our determination that performing procedures relating to accrued CRO costs is a critical audit matter are a high degree of auditor effort in performing procedures and evaluating audit evidence related to the Company's accrued CRO costs.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the financial statements. These procedures included, among others (i) testing management's process for developing the estimated accrued CRO costs; (ii) testing the completeness and accuracy of the data used in developing the CRO accruals, including data related to patient visits and clinical site activations; and (iii) examining clinical vendor contracts to evaluate the completeness and accuracy of costs considered in the estimates.

/s/PricewaterhouseCoopers LLP
San Jose, California
March 18, 2026

We have served as the Company's auditor since 2016.

4D Molecular Therapeutics, Inc.
Balance Sheets
(In thousands, except share and per share amounts)

	As of December 31,	
	2025	2024
Assets		
Current assets:		
Cash and cash equivalents	$ 60,241	$ 149,336
Marketable securities	342,414	275,541
Prepaid expenses and other current assets	10,479	10,055
Total current assets	413,134	434,932
Marketable securities, long-term	111,379	80,583
Property and equipment, net	14,867	19,534
Operating lease right-of-use assets, net	18,143	21,074
Other assets	9,188	4,261
Total assets	$ 566,711	$ 560,384
Liabilities and Stockholders' Equity		
Current liabilities		
Accounts payable	$ 11,159	$ 4,386
Accrued and other current liabilities	26,874	18,869
Deferred revenue	360	257
Operating lease liabilities, current portion	5,592	5,637
Total current liabilities	43,985	29,149
Deferred revenue, net of current portion	745	1,057
Derivative liability	358	410
Operating lease liabilities, long-term portion	15,821	18,969
Other liabilities	138	193
Total liabilities	61,047	49,778
Commitments and contingencies (Note 8)		
Stockholders' equity		
Preferred stock, $0.0001 par value, 10,000,000 shares authorized at December 31, 2025 and 2024; no shares issued and outstanding at December 31, 2025 and 2024	—	—
Common stock, $0.0001 par value, 300,000,000 shares authorized at December 31, 2025 and 2024; 57,607,874 and 45,793,942 shares issued and outstanding at December 31, 2025 and 2024, respectively	6	5
Additional paid-in-capital	1,221,235	1,086,567
Accumulated other comprehensive gain	727	229
Accumulated deficit	(716,304)	(576,195)
Total stockholders' equity	505,664	510,606
Total liabilities and stockholders' equity	$ 566,711	$ 560,384

The accompanying notes are an integral part of these financial statements

4D Molecular Therapeutics, Inc.
Statements of Operations
(In thousands, except share and per share amounts)

	Year Ended December 31,	
	2025	**2024**
Revenue:		
Collaboration and license revenue	$ 85,209	$ 37
Operating expenses:		
Research and development (includes $1,322 and $1,005 for the years ended December 31, 2025 and 2024, respectively, attributable to related parties)	195,696	141,299
General and administrative	49,060	46,579
Total operating expenses	244,756	187,878
Loss from operations	(159,547)	(187,841)
Other income (expense):		
Interest income	19,475	27,050
Other expense, net	(37)	(77)
Total other income, net	19,438	26,973
Net loss	$ (140,109)	$ (160,868)
Net loss per share, basic and diluted	$ (2.42)	$ (2.98)
Weighted-average shares outstanding used in computing net loss per share, basic and diluted	57,930,180	53,943,741

The accompanying notes are an integral part of these financial statements

4D Molecular Therapeutics, Inc.
Statements of Comprehensive Loss
(In thousands)

	Year Ended December 31,	
	2025	2024
Net loss	$ (140,109)	$ (160,868)
Other comprehensive loss:		
Net unrealized gain on marketable securities	498	213
Total comprehensive loss	$ (139,611)	$ (160,655)

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

4D Molecular Therapeutics, Inc.
Statements of Stockholders' Equity
(In thousands, except share amounts)

	Common Stock		Additional Paid-In	Accumulated Other Comprehensive	Accumulated	Total Stockholders'
	Shares	Amount	Capital	Gain (Loss)	Deficit	Equity
Balances at December 31, 2023	43,075,218	$ 4	$ 723,136	$ 16	$ (415,327)	$ 307,829
Issuance of common stock upon exercise of stock options and vesting of RSUs	427,036	—	4,580	—	—	4,580
Issuance of common stock upon public offering, net of issuance costs - February / March 2024 Public Offering Sale	7,845,314	1	316,148	—	—	316,149
Issuance of common stock upon ATM offering, net of issuance costs	585,938	—	15,263	—	—	15,263
Issuance of common stock - 2020 ESPP	170,436	—	1,258	—	—	1,258
Issuance of pre-funded warrant for common stock conversions	(6,310,000)	—	—	—	—	—
Stock-based compensation expense	—	—	26,116	—	—	26,116
Vesting of common stock warrants issued for services	—	—	66	—	—	66
Net unrealized gain on marketable securities	—	—	—	213	—	213
Net loss	—	—	—	—	(160,868)	(160,868)
Balances at December 31, 2024	45,793,942	$ 5	$ 1,086,567	$ 229	$ (576,195)	$ 510,606
Issuance of common stock upon exercise of stock options and vesting of RSUs	319,699	—	984	—	—	984
Issuance of common stock upon underwritten offering, net of issuance costs	8,385,809	1	93,339	—	—	93,340
Issuance of common stock upon ATM offering, net of issuance costs	1,175,000	—	9,576	—	—	9,576
Issuance of common stock - 2020 ESPP	467,762	—	1,253	—	—	1,253
Issuance of common stock - exercise of pre-funded warrants	178,280	—	—	—	—	—
Issuance of common stock - stock purchase agreement	776,398	—	7,500	—	—	7,500
Issuance of common stock - exercise of equity warrants	508,465	—	—	—	—	—
Issuance of common stock upon exercise of service warrants	2,519	—	—	—	—	—
Stock-based compensation expense	—	—	22,016	—	—	22,016
Net unrealized gain on marketable securities	—	—	—	498	—	498
Net loss	—	—	—	—	(140,109)	(140,109)
Balances at December 31, 2025	57,607,874	$ 6	$ 1,221,235	$ 727	$ (716,304)	$ 505,664

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

4D Molecular Therapeutics, Inc.
Statements of Cash Flows
(In thousands)

	Year ended December 31,	
	2025	2024
Cash flows from operating activities		
Net loss	$ (140,109)	$ (160,868)
Adjustments to reconcile net loss to net cash used in operating activities		
Stock-based compensation expense	22,016	26,116
Vesting of common stock warrants in return for services	—	66
Change in fair value of derivative liability	(52)	41
Depreciation and amortization	4,694	4,653
Amortization of right-of-use assets	2,931	2,052
Net accretion of discount on marketable securities	(4,734)	(7,182)
Changes in operating assets and liabilities		
Prepaid expenses and other current assets	(424)	(1,699)
Other assets	(4,927)	(3,577)
Accounts payable	6,773	871
Accrued and other liabilities	8,152	6,524
Deferred revenue	(209)	69
Operating lease liabilities	(3,193)	(1,651)
Net cash used in operating activities	(109,082)	(134,585)
Cash flows from investing activities		
Purchases of marketable securities	(442,821)	(467,652)
Maturities of marketable securities	350,384	169,001
Acquisition of property and equipment	(536)	(3,786)
Net cash used in investing activities	(92,973)	(302,437)
Cash flows from financing activities		
Issuance of common stock upon exercise of stock options and vesting of RSUs	984	4,580
Issuance of common stock upon public offering, net of issuance costs	—	316,149
Issuance of common stock upon underwritten offering, net of issuance costs	93,540	—
Issuance of common stock under the ATM offering program, net of issuance costs	9,683	15,263
Issuance of common stock - 2020 ESPP	1,253	1,258
Issuance of common stock under stock purchase agreement	7,500	—
Net cash provided by financing activities	112,960	337,250
Net decrease in cash and cash equivalents	(89,095)	(99,772)
Cash and cash equivalents, beginning of period	149,336	249,108
Cash and cash equivalents, end of period	$ 60,241	$ 149,336
Supplemental disclosures of noncash investing and financing information		
Unpaid stock issuance costs in accrued and other liabilities	$ 307	$ —
Purchases of property and equipment in accounts payable and accrued and other liabilities	$ —	$ 509
Right-of-use assets obtained in exchange for lease obligations	$ —	$ 11,587

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

1. The Company

4D Molecular Therapeutics, Inc. (the "Company") was formed as a limited liability company in September 2013 under the name 4D Molecular Therapeutics, LLC. The Company changed its name and converted into a corporation which was incorporated in the state of Delaware in March 2015. The Company is a late-stage biotechnology company advancing durable and disease-targeted therapeutics with potential to transform treatment paradigms and provide benefits to patients.

2024 Follow On Public Offering

In February 2024, the Company completed an underwritten public offering (the "2024 Offering") in which 6,586,015 shares of the Company's common stock were sold at an offering price of $29.50 per share, as well as pre-funded warrants to purchase 3,583,476 shares of the Company's common stock at an offering price of $29.4999 per underlying share pursuant to an effective Registration Statement on Form S-3. The net proceeds from the 2024 Offering were $281.2 million, after deducting underwriting discounts and commissions and other offering expenses. The Company also granted the underwriters the option to purchase up to 1,525,423 additional shares of common stock in connection with the offering. In March 2024, the underwriters exercised their option to purchase 1,259,299 additional shares of common stock resulting in net proceeds of $34.9 million, after deducting commissions.

2025 Offering

In November 2025, the Company completed an underwritten offering (the "2025 Offering") in which 8,385,809 shares of the Company's common stock were sold at an offering price of $10.51 per share, as well as pre-funded warrants to purchase 1,128,949 shares of the Company's common stock at an offering price of $10.5099 per underlying share pursuant to an effective Registration Statement on Form S-3. The net proceeds from the 2025 Offering were approximately $93.3 million, after deducting the underwriting discounts and commissions and other offering expenses.

Liquidity

The Company has incurred significant losses and negative cash flows from operations and had an accumulated deficit of $716.3 million as of December 31, 2025. The Company had cash, cash equivalents and marketable securities of $514.0 million as of December 31, 2025. The Company believes that its cash and cash equivalents and marketable securities as of December 31, 2025 are sufficient for the Company to fund planned operations for at least one year from the issuance date of these financial statements for the year ended December 31, 2025. The Company has historically financed its operations primarily through the sale of equity securities, and to a lesser extent, from cash received pursuant to its collaboration and license agreements. To date, none of the Company's product candidates have been approved for sale, and therefore, the Company has not generated any revenue from product sales. Management expects operating losses and negative cash flows from operations to continue for the foreseeable future. The Company plans to raise additional funding as required based on the status of its clinical trials and projected cash flows. There can be no assurance that, in the event the Company requires additional financing, such financing will be available on terms acceptable to the Company, if at all. Failure to generate sufficient cash flows from operations, raise additional capital and reduce discretionary spending should additional capital not become available could have a material adverse effect on the Company's ability to achieve its business objectives.

2. Summary of Significant Accounting Policies

Basis of Presentation

The accompanying financial statements have been prepared in accordance with United States Generally Accepted Accounting Principles ("U.S. GAAP").

Use of Estimates and Judgments

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue and expenses; and disclosure of contingent assets and liabilities as of the date of the financial statements. Such estimates include the determination of useful lives for property and equipment, the contract term, transaction price and costs of collaboration agreements, stock options and the derivative instrument and income tax uncertainties. Actual results could differ from those estimates.

Due to the war in Ukraine, conflicts in the Middle East, any expansion of these conflicts, rising interest rates, tariffs and inflation, natural disasters and health crises, such as pandemics, there has been uncertainty and disruption in the global economy and financial markets. The Company is not aware of any specific event or circumstance that would require an update to its estimates or judgments or a revision of the carrying value of its assets or liabilities as of December 31, 2025. While there was not a material impact to the Company's financial statements as of December 31, 2025, these estimates may change, as new events occur and additional information is obtained, as well as other factors that could result in material impacts to the financial statements in future reporting periods.

Segment Information

The Company manages its business as one segment which includes all activities related to the discovery, development, and commercialization of medicines for specific diseases. See Note 17, Segment Information, for financial information related to the Company's one segment.

Concentration of Credit Risk

Financial instruments that potentially subject the Company to a concentration of credit risk consist of cash and cash equivalents, marketable securities and accounts receivable. The Company's cash is held at two financial institutions in the United States of America. The Company's cash equivalents are invested in money market funds. The Company also invests in U.S. Treasuries, U.S. government sponsored agencies, commercial paper, corporate bonds and certificates of deposit. The Company has not experienced any losses on its deposits of cash and cash equivalents. Such deposits may, at times, exceed federally insured limits.

The Company's partners in collaboration and license agreements who represent 10% or more of the Company's total revenue are as follows:

	Year Ended December 31,	
	2025	2024
Customer A	*	100%
Customer B	100%	-
Total	100%	100%

* Less than 10%

The Company did not have accounts receivable from its partners in collaboration and license agreements as of December 31, 2025 and 2024.

The Company's total revenues by geographic region, based on the location of the customer, are as follows (in thousands):

	Year Ended December 31,	
	2025	2024
United States	$ 209	$ 37
Japan	85,000	—
Total revenue	$ 85,209	$ 37

Cash and Cash Equivalents

The Company considers all highly liquid investments with original maturities of three months or less at the date of purchase to be cash equivalents. Cash equivalents consist of money market funds.

Marketable Securities

Marketable securities consist of certificates of deposit, commercial paper, corporate bonds, U.S. Treasuries and U.S. government sponsored agencies and are included in current and noncurrent assets. The Company classifies its marketable securities as available-for-sale and carries them at fair value on its balance sheet. Fair value is estimated using independent pricing sources based on quoted prices in active markets for similar securities. Unrealized gains and losses on the marketable securities are reported as a component of stockholders' equity in accumulated other comprehensive loss. The amortized cost of marketable securities is adjusted for amortization of premiums and accretion of discounts to maturity, which is included in interest income on the statements of operations. Realized gains and losses are included in interest income on the statements of operations.

The Company periodically evaluates its marketable securities to assess whether those with unrealized loss positions are other than temporarily impaired. The Company considers various factors in determining whether to recognize an impairment charge. If the Company determines that the decline in an investment's fair value is other-than-temporary, the difference is recognized as an impairment loss under other income (expense) in the statements of operations.

Acquisitions

The Company first determines whether a set of assets acquired constitute a business and should be accounted for as a business combination. If the assets acquired do not constitute a business, the Company accounts for the transaction as an asset acquisition where the cost of the acquisition is allocated to the assets acquired and liabilities based on their relative fair values. In-process research and development ("IPR&D") projects with no alternative future use are recorded as research and development expense upon acquisition, and contingent consideration obligations incurred in connection with an asset acquisition are recorded when it is probable that they will occur and they can be reasonably estimated. Business combinations are accounted for by means of the acquisition method of accounting. Under the acquisition method, assets acquired, including IPR&D projects, and liabilities assumed are recorded at their respective fair values as of the acquisition date. The excess of the fair value of consideration transferred over the fair value of the net assets acquired is recorded as goodwill.

Other Risks and Uncertainties

The Company is subject to risks and uncertainties common to early-stage companies in the biotechnology industry, including, but not limited to, development by competitors of new technological innovations, protection of proprietary technology, dependence on key personnel, suppliers for key raw materials, contract development and manufacturing organizations ("CDMOs") and contract research organizations ("CROs"), compliance with government regulations and the need to obtain additional financing to fund operations. Product candidates currently under development will require significant additional research and development efforts, including extensive preclinical studies, clinical trials and regulatory approval, prior to commercialization. These efforts require significant amounts of additional capital, adequate personnel and infrastructure and extensive compliance and reporting.

There can be no assurance that the Company's research and development will be successfully completed, that adequate protection for the Company's intellectual property will be obtained or maintained, that any products developed will obtain necessary government regulatory approval or that any approved products will be commercially viable. Even if the Company's product development efforts are successful, it is uncertain when, if ever, the Company will generate significant revenue from product sales. The Company operates in an environment of rapid change in technology and substantial competition from other pharmaceutical and biotechnology companies. In addition, the Company is dependent upon the services of its employees, consultants and other third parties (including for clinical trials and some aspects of research and preclinical testing).

Fair Value Measurements

The Company applies fair value accounting for all financial assets and liabilities and nonfinancial assets and liabilities that are recognized or disclosed at fair value in the financial statements on a recurring basis. Fair value is an exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants on the measurement date. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or liability.

As a basis for considering such assumptions, a three-level fair value hierarchy has been established, which prioritizes the inputs used in measuring fair value as follows:

- *Level 1* — Observable inputs that reflect unadjusted quoted market prices in active markets for identical assets or liabilities that are accessible at the measurement date.
- *Level 2* — Inputs other than Level 1 that are observable, either directly or indirectly, such as quoted prices for similar assets or liabilities; quoted prices in markets that are not active; or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.
- *Level 3* — Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

The Company accounts for transfers of financial instruments between levels of the fair value hierarchy on the date of the event or change in circumstance that caused the transfer.

Accounts Receivable—Allowance for Doubtful Accounts

The Company regularly reviews accounts receivable for collectability and establishes an allowance for probable credit losses and writes off uncollectible accounts as necessary. The Company has determined that no allowance was required at December 31, 2025 and 2024. The Company did not have any write-offs relating to uncollectible accounts receivable during the years ended December 31, 2025 and 2024.

Property and Equipment, Net

Property and equipment are stated at cost less accumulated depreciation for acquired assets. Depreciation is computed using the straight-line method over the estimated useful lives of the respective assets, which are as follows:

Asset	Estimated Useful Life
Computer equipment and software	3 years
Office equipment	3 years
Furniture and fixtures	5 years
Laboratory equipment	5 years
Vehicles	5 years
Leasehold improvements	Shorter of useful life or lease term

Upon sale or retirement of assets, the costs and related accumulated depreciation are removed from the balance sheet and the resulting gain or loss is reflected within operating expenses in the statements of operations. Maintenance and repairs are charged to expense as incurred.

Impairment of Long-Lived Assets

The Company reviews long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability is measured by comparison of the carrying amount to the future undiscounted net cash flows, which the assets are expected to generate. If such assets are considered to be impaired, the impairment to be recognized is typically measured by the amount by which the carrying amount of the assets exceeds the projected discounted future net cash flows arising from the asset. There have been no such impairments of long-lived assets in the years ended December 31, 2025 and 2024.

Common Stock Warrants

The Company accounts for common stock warrants which meet the definition of a derivative as liabilities if the warrant requires net cash settlement or gives the holder the option of net cash settlement. The Company accounts for common stock warrants as equity if the contract requires physical settlement or net physical settlement or if the Company has the option of physical settlement or net physical settlement. Common stock warrants classified as liabilities are initially recorded at fair value and remeasured at fair value each balance sheet date with the offset adjustments recorded in other income (expense), net within the statements of operations. Common stock warrants classified as equity are initially measured at fair value on the grant date and are not subsequently remeasured.

Leases

The Company’s lease obligations relate primarily to leased office, laboratory and warehouse facilities under noncancelable operating leases.

At contract inception, the Company determines if an arrangement is or contains a lease. A contract is or contains a lease if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration. If determined to be or contain a lease, the lease is assessed for classification as either an operating or finance lease at the lease commencement date, defined as the date on which the leased asset is made available for use by the Company, based on the economic characteristics of the lease.

A right-of-use asset represents the economic benefit conveyed to the Company by the right to use the underlying asset over the lease term. A lease liability represents the obligation to make lease payments arising from the lease. Operating lease right-of-use assets represent the Company's right to use an underlying asset for the lease term and operating lease liabilities represent the Company's obligation to make payments arising from the lease. Operating right-of-use assets and liabilities are recognized at the commencement date of the lease and are measured at the present value of the fixed payments due over the expected lease term less the present value of any incentives, rebates, or abatements the Company expects to receive from the lessor. The Company records amortization of operating right-of-use assets and accretion of lease liabilities as a single lease cost on a straight-line basis over the lease term. No lease renewal options are recognized as part of the right-of-use assets and lease liabilities.

The Company's operating leases are presented in the balance sheet as operating lease right-of-use assets, classified as noncurrent assets, and operating lease liabilities, classified as current and noncurrent based on the discounted lease payments to be made within the proceeding twelve months.

As the implicit rate in the Company’s leases is not readily determinable, the Company uses its incremental borrowing rate to discount lease payments. The incremental borrowing rate represents an estimated rate of interest that the Company would have to pay to borrow equivalent funds on a collateralized basis at the lease commencement date.

Revenue Recognition

The Company determines revenue recognition for arrangements within the scope of Accounting Standards Update 2014-09, Revenue from Contracts with Customers (Topic 606) (“ASC 606”) by performing the following five steps: (i) assessment whether a contract with a customer exists; (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 based on estimated standalone selling prices; and (v) recognition of revenue when (or as) the Company satisfies each performance obligation.

The Company’s revenue is primarily derived through its license, research, development and commercialization agreements. The terms of these types of agreements may include (i) licenses to the Company’s technology, (ii) research and development services, and (iii) supplies of clinical and commercial materials. A performance obligation is a promise in a contract to transfer a distinct good or service to the customer, and is the unit of account in ASC 606. Significant judgment is required to determine whether the individual promised goods or services are distinct. Items are considered distinct if the customer can benefit from them on their own, or together with other readily available resources, and if they are separately identifiable from other items in the contract.

Payments to the Company under these arrangements typically include one or more of the following: nonrefundable upfront and license fees, cost-sharing and other forms of research funding, milestone and other contingent payments to the Company for the achievement of defined collaboration objectives and certain preclinical, clinical, regulatory and sales-based events, as well as royalties on sales of any commercialized products.

The Company recognizes as revenue sales-based royalties and milestone payments at the later of (i) when the related sales occur, or (ii) when the performance obligation to which the royalty has been allocated has been satisfied.

Other variable amounts, such as cost-sharing and development and regulatory milestones, are included in the transaction price to the extent it is probable a significant reversal of cumulative revenue recognized will not occur when the associated uncertainties are resolved. The Company uses the most likely or expected value amount methods as appropriate to estimate variable consideration.

At the end of each reporting period, the Company re-evaluates the estimated variable consideration included in the transaction price and any related constraint, and if necessary, adjusts its estimate of the overall transaction price.

The Company allocates the total transaction price to each performance obligation based on the estimated standalone selling prices. Variable consideration is allocated to the specific performance obligations if it is triggered by the Company's performance or the outcomes from such performance, and if such allocation meets the allocation objective of recognizing revenue in amounts of consideration to which the Company expects to be entitled in exchange for transferring its promised goods or services to the customer.

The Company recognizes revenue when, or as, the performance obligation is satisfied. Performance obligations recognized at a point in time, such as distinct licenses to the Company's intellectual property, are recognized when control transfers, including commencement of the license term. Performance obligations recognized over time, such as research and development services, are recognized using an appropriate measure of progress, such as total cost incurred.

The Company records accounts receivable when the Company's right to consideration is unconditional, i.e. if only passage of time is required before payment is due. Amounts collected or included in accounts receivable but not yet recognized in revenue are recorded as deferred revenues. Amounts recognized in revenue but not included in accounts receivable are recorded as contract assets.

Significant management judgment is required to determine the level of effort required under an arrangement and the period over which the Company expects to complete its performance obligations under the arrangement. Changes in these estimates can have a material effect on revenue recognized.

Research and Development Expenses

Costs related to research, design and development of programs are charged to research and development expense as incurred. Research and development costs include, but are not limited to, payroll and personnel expenses including stock-based compensation, materials, laboratory supplies, outside services and allocated overhead, including rent, insurance, repairs and maintenance, depreciation and utilities. The Company expenses all research and development costs in the period in which they are incurred.

Costs incurred in obtaining technology licenses are charged to research and development expense as acquired in-process research and development if the technology licensed has not reached technological feasibility and has no alternative future use.

Accrued Clinical Research Organization Cost

The Company has entered into various agreements with clinical research organizations (CROs). Accrued CRO costs include direct costs, as well as costs associated with patient visits and site activations. These costs are estimated based on the level of services performed, progress of the studies, including the phase or completion of events, and contracted costs. The estimated costs of research and development provided, but not yet invoiced by CROs, are included in accrued and other current liabilities on the balance sheet. If the actual timing of the performance of services or the level of effort varies from the original estimates, the Company will adjust the accrual accordingly. Estimating the accrued research organization costs as of each balance sheet date requires the process of reviewing contracts and purchase orders with service providers, identifying services that have been performed on the Company's behalf and estimating the level of service performed, the expected remaining period of performance and the associated expenses incurred for the service when the Company has not yet been invoiced or notified of actual cost. Payments made to CROs under these arrangements in advance of the performance of the related services are recorded as prepaid expenses, other current assets or long-term other assets until the services are rendered.

Stock-Based Compensation

The Company accounts for stock-based compensation for stock options granted to employees, directors and nonemployees as measured at grant date, based on the fair value of the award. The Company measures the fair value of awards granted using the Black-Scholes option pricing model and recognizes the expense in the statements of operations over the requisite service period, generally four years, using the straight-line method. Forfeitures are accounted for as they occur. The Company's policy for issuing stock upon stock option exercise is to issue new common stock.

Income Taxes

The Company accounts for income taxes under the asset and liability method, which requires, among other things, that deferred income taxes be provided for temporary differences between the tax basis of the Company's assets and liabilities and their financial statement reported amounts. In addition, deferred tax assets are recorded for the future benefit of utilizing net operating losses and research and development credit carryforwards and are measured using the enacted tax rates and laws that will be in effect when such items are expected to reverse. A valuation allowance is provided against deferred tax assets unless it is more likely than not that they will be realized.

The Company accounts for uncertain tax positions by assessing all material positions taken in any assessment or challenge by relevant taxing authorities. Assessing an uncertain tax position begins with the initial determination of the position's sustainability and is measured at the largest amount of benefit that is greater than fifty percent likely of being realized upon ultimate settlement. The Company's policy is to recognize interest and penalties related to the underpayment of income taxes as a component of income tax expense or benefit. To date, there have been no interest or penalties charged in relation to the unrecognized tax benefits.

Embedded Derivative

Embedded derivatives that are required to be bifurcated from the underlying host instrument are accounted for and valued as a separate financial instrument. An embedded derivative exists in the award agreement with the Cystic Fibrosis Foundation ("CFF"). As described in Note 14, Derivative Liability, the embedded derivative has been bifurcated and is classified as a liability on the balance sheet and separately accounted for at its fair value. The derivative liability is subject to remeasurement to fair value each reporting period. Changes in the fair value of the derivative liability are recognized as a component of other income (expense), net within the statements of operations.

Deferred Offering Costs

The Company capitalizes certain legal, accounting and other third-party fees that are directly related to the Company's in-process financings, until such financings are consummated. After consummation of the financing, these costs are recorded as a reduction of the proceeds received as a result of the offering. In the event that a planned offering does not occur or is significantly delayed, all related deferred offering costs will be expensed immediately within the Company's statements of operations.

Net Loss Per Share, Basic and Diluted

Basic net loss per share is calculated by dividing the net loss by the weighted-average number of shares of common stock outstanding during the period. Diluted net loss per share is computed by giving effect to all potentially dilutive common shares outstanding for the period. For purposes of this calculation, stock options to acquire shares of common stock, common stock warrants, and common stock expected to be issued under the ESPP, are considered potentially dilutive common shares, but have been excluded from the calculation of diluted net loss per share as their effect is antidilutive.

Recently Adopted Accounting Pronouncements

In December 2023, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2023-09, *Improvements to Income Tax Disclosures.* The final guidance adds clarifications related to the presentation of rate reconciliation for public business entities and definitions of specific categories in rate reconciliation. These amendments are effective for public business entities for annual periods beginning after December 15, 2024. The Company adopted ASU No. 2023-09 for the 2025 calendar year prospectively. The adoption impacted disclosures only and did not impact the Company's statements of operations or balance sheets.

Recently Issued Accounting Pronouncements Not Yet Adopted

In November 2024, the FASB issued ASU No. 2024-03, *Income Statement - Reporting Comprehensive Income - Expense Disaggregation Disclosures (Topic 220) - Disaggregation of Income Statement Expenses*. ASU 2024-03 requires public business entities to disclose, on an annual and interim basis, disaggregated information about certain income statement expense line items in the notes to the financial statements. ASU 2024-03 is effective for fiscal years beginning after December 15, 2026 (fiscal 2027) and interim periods within fiscal years beginning after December 15, 2027 (fiscal 2028). The ASU must be applied prospectively and may be applied retrospectively if elected. The Company is currently evaluating the effect of adopting this new accounting guidance.

3. Fair Value Measurements and Marketable Securities

The following tables represent the Company's fair value hierarchy for financial assets and financial liabilities measured at fair value on a recurring basis (in thousands):

	Amortized Cost Basis	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value as of December 31, 2025	Cash and Cash Equivalents	Current Marketable Securities	Non-Current Marketable Securities
Assets							
Cash	$ 10,696	$ —	$ —	$ 10,696	$ 10,696	$ —	$ —
Level 1:							
Money market funds	39,570	—	—	39,570	39,570	—	—
Level 2:							
Certificates of deposit	35,986	37	—	36,023	—	36,023	—
Commercial paper	63,875	48	—	63,923	5,479	58,444	—
U.S. Treasuries	76,920	153	—	77,073	—	63,589	13,484
Corporate bonds	286,260	492	(3)	286,749	4,496	184,358	97,895
Subtotal	463,041	730	(3)	463,768	9,975	342,414	111,379
Total	$ 513,307	$ 730	$ (3)	$ 514,034	$ 60,241	$ 342,414	$ 111,379

	Amortized Cost Basis	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value as of December 31, 2024	Cash and Cash Equivalents	Current Marketable Securities	Non-Current Marketable Securities
Assets							
Cash	$ 6,715	$ —	$ —	$ 6,715	$ 6,715	$ —	$ —
Level 1:							
Money market funds	142,621	—	—	142,621	142,621	—	—
Level 2:							
Certificates of deposit	47,592	55	—	47,647	—	47,647	—
Commercial paper	60,144	59	(1)	60,202	—	58,057	2,145
U.S. Treasuries	32,224	8	(122)	32,110	—	6,751	25,359
Corporate bonds	215,935	361	(131)	216,165	—	163,086	53,079
Subtotal	355,895	483	(254)	356,124	—	275,541	80,583
Total	$ 505,231	$ 483	$ (254)	$ 505,460	$ 149,336	$ 275,541	$ 80,583

There are no Level 3 assets and no Level 1 or 2 liabilities.

Level 3 Inputs

The fair value of the derivative liability is based on significant inputs not observable in the market, which represent a Level 3 measurement within the fair value hierarchy. The fair value of the derivative liability was determined using a present value analysis with multiple scenarios. In determining the fair value of the derivative liability, the inputs impacting fair value include the change of control payment to Cystic Fibrosis Foundation, the probability of a change of control event, the product status at time of a change of control event and the discount rate. See Note 14, Derivative Liability, for further discussion on the embedded derivative.

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

The following table sets forth a summary of the changes in the fair value of the Company's Level 3 derivative liability (in thousands):

Balance as of December 31, 2023	$ 369
Change in fair value included in other income (expense), net	41
Balance as of December 31, 2024	410
Change in fair value included in other income (expense), net	(52)
Balance as of December 31, 2025	$ 358

All marketable securities held as of December 31, 2025 had contractual maturities of less than two years. There have been no material realized gains or losses on marketable securities for the periods presented.

Aggregate fair values of marketable securities with unrealized losses and gains were as follows (in thousands):

	As of December 31,	
	2025	2024
Aggregate fair value of marketable securities in a continuous loss position for less than twelve months	$ 15,449	$ 69,947
Aggregate fair value of marketable securities in a continuous loss position for more than twelve months	1,951	—
Aggregate fair value of marketable securities in unrealized gain position	446,368	286,177
Total marketable securities	$ 463,768	$ 356,124

The Company manages credit risk associated with its investment portfolio through its investment policy, which limits purchases to high-quality issuers and also limits the amount of its portfolio that can be invested in a single issuer. The Company did not record an allowance for credit losses or other impairment charges related to its marketable securities for any period presented. The Company has determined that (i) it does not have the intent to sell any of these investments, and (ii) it is not more likely than not that it will be required to sell any of these investments before recovery of the entire amortized cost basis. The Company further considered the maximum unrealized loss amounts both at the individual instrument level, $1 thousand, as well as in aggregate, $3 thousand, as of December 31, 2025, as immaterial. These unrealized losses were not attributed to credit risk and were associated with changes in market conditions. The Company periodically reviews its marketable securities for indications of credit losses. The Company anticipates that it will recover the entire amortized cost basis of such securities, and therefore, no credit loss existed as of December 31, 2025.

4. Property and Equipment, Net

Property and equipment, net, consisted of the following (in thousands):

	December 31,	
	2025	2024
Machinery and equipment	$ 14,538	$ 14,172
Leasehold improvements	18,467	17,763
Furniture and fixtures	1,086	1,104
Office equipment	324	256
Computer equipment and software	1,685	1,596
Transportation equipment	46	46
Construction in progress	—	1,182
Total property and equipment	36,146	36,119
Less: Accumulated depreciation and amortization	(21,279)	(16,585)
Property and equipment, net	$ 14,867	$ 19,534

All property and equipment are maintained in the United States. Depreciation expense was $5.2 million and $4.8 million for the years ended December 31, 2025 and 2024, respectively.

5. Accrued and Other Current Liabilities

Accrued and other current liabilities consisted of the following (in thousands):

	December 31,	
	2025	2024
Payroll and related expenses	$ 13,806	$ 8,106
Accrued clinical and preclinical study costs	10,273	7,977
Consulting and professional	2,666	2,672
Other accrued expenses	129	114
Total accrued and other current liabilities	$ 26,874	$ 18,869

6. Research and Collaboration Arrangements

Collaboration and license revenue for each period was as follows (in thousands):

	Year Ended December 31,	
	2025	2024
Otsuka Pharmaceutical Co., Ltd.	$ 85,000	$ —
Cystic Fibrosis Foundation	209	37
Total revenue	$ 85,209	$ 37

Deferred revenue is summarized as follows (in thousands):

	December 31,	
	2025	2024
Cystic Fibrosis Foundation	$ 1,105	$ 1,314

The total amount of revenue in each of the years ended December 31, 2025 and 2024, which was included in deferred revenue at January 1, 2025 and 2024, was immaterial.

uniQure

In January 2014, the Company and uniQure biopharma B.V. (“uniQure”) entered into a Collaboration and License Agreement (the “uniQure Agreement”) to collaborate on the discovery and non-clinical research activities related to the Company’s Therapeutic Vector Evolution platform in order to generate and validate vectors for gene delivery to treat diseases within the central nervous system and liver (together, the “uniQure Field”).

The uniQure Agreement provided uniQure with a research license as well as an exclusive development and commercialization license for each project variant selected for further development. The initial research term is three years with an option for uniQure to extend the research term one time for an additional year. Once the Company’s research plan has concluded, uniQure is solely responsible for the continued development, manufacturing and commercialization of the project variants as potential product candidates. In October 2016, uniQure exercised its option to extend the research term for an additional year to January 2018. The Company was also required to work exclusively with uniQure in the uniQure Field (the “uniQure Exclusivity Clause”).

Pursuant to the uniQure Agreement, the Company received upfront payments of $0.2 million, and was entitled to receive (i) contingent payments for the achievement of research and development milestones of up to $5.0 million for each licensed product selected under the arrangement, and (ii) royalties in the single digit range on future sales of the potential product candidates and sublicense consideration in the low teens to low thirties range on any future sublicensing arrangements. The

Company also received capped research and development service fees based on contractual full-time employee rates per year. In connection with the performance obligations under the uniQure Agreement, the founders of 4D Molecular Therapeutics, LLC received equity options to purchase an aggregate of 609,744 of uniQure ordinary shares that vested over the initial three-year term of the agreement.

The upfront payment of $0.2 million was recorded as deferred revenue and was recognized on a ratable basis over the estimated performance period of four years. Payments and reimbursements for research costs were recognized on an as-incurred basis. The options to purchase uniQure shares were deemed to be a noncash component of the arrangement consideration, as the vesting of options is linked to the uniQure Agreement and there is a requirement for the holders of the options to provide services under the agreement. The fair value of the uniQure options, which was estimated to be $10.6 million, was recognized ratably as revenue over the estimated performance period of four years and the associated compensation expense related to the stock options was recorded as research and development expense.

In August 2019, the Company and uniQure entered into an Amended and Restated Collaboration and License Agreement (the “Amended uniQure Agreement”), which amended and restated the uniQure Agreement, and a separate Collaboration and License Agreement (the “Second uniQure Agreement”). Under these agreements, the Company agreed to transfer incremental rights and services to uniQure in exchange for uniQure eliminating the uniQure Exclusivity Clause and transferring other rights back to the Company.

Under the Amended uniQure Agreement, uniQure continues to have an exclusive license to select AAV capsid variants (the “Selected Variants”) in the uniQure Field. uniQure continues to be solely responsible, at its cost, to develop and commercialize the compounds and products containing the Selected Variants. The amended uniQure Agreement eliminated the uniQure Exclusivity Clause in the uniQure Agreement. Furthermore, the contingent payments that the Company was entitled to from uniQure for the achievement of research and development milestones of up to $5.0 million for each licensed product selected under the uniQure Agreement were eliminated and sublicense consideration on any future sublicensing arrangements was reduced from the low teens to low thirties percentages to mid-single digit to mid-twenties percentages.

Under the Second uniQure Agreement, the parties agreed to research and develop new AAV capsid variants (the “New Variants”) that are not Selected Variants that affect certain targets selected by uniQure (the “uniQure Targets”) in the uniQure Field. The Company is solely responsible, at its cost, for the research of the New Variants. The Company granted uniQure an exclusive license to a certain number of the New Variants (the “uniQure New Variants”) that affect the uniQure Targets. uniQure is solely responsible, at its cost, to develop and commercialize the compounds and products containing the uniQure New Variants that affect the uniQure Targets (the “Licensed Products”). The Company retains all rights to New Variants in the uniQure Field that affect targets other than the uniQure Targets.

Under both the Amended uniQure Agreement and the Second uniQure Agreement, uniQure will be required to pay the Company royalties on worldwide annual net sales of Licensed Products at a mid-single digit percentage rate, subject to certain specified reductions. uniQure will also be required to pay the Company sublicensing consideration for sublicensing the Company’s intellectual property rights licensed under the Amended uniQure Agreement or the Second uniQure Agreement to third parties at a rate between the mid-single digit to mid-twenties. The Company has reciprocal obligations, at the same percentage rates as uniQure, to pay uniQure royalties and sublicensing consideration for sublicensing certain intellectual property rights licensed under the Amended uniQure Agreement or the Second uniQure Agreement to third parties.

The Company concluded that the Amended uniQure Agreement and the Second uniQure Agreement should be accounted for as one combined contract that should be accounted for as a separate contract from the uniQure Agreement given that the incremental licensed intellectual property rights and research and development services are distinct from the rights and services previously transferred to uniQure under the uniQure Agreement and the transaction price increased by an amount that equals the standalone selling price of the incremental rights and services to be transferred to uniQure under the Amended uniQure Agreement and Second uniQure Agreement.

Neither party was required to pay monetary consideration in connection with the execution of the Amended uniQure Agreement or the Second uniQure Agreement or for subsequent performance by the parties under those agreements, notwithstanding the potential future royalty and sublicense consideration described above. The fair value of the non-monetary consideration given by uniQure to the Company, for the intellectual property right was $5.1 million. This intellectual property right was considered to be an in-process research and development asset with no alternative future use and, accordingly, was written off as acquired in-process research and development expense in the year ended December 31, 2019.

In accordance with Accounting Standards Codification ("ASC") Topic 606, *Revenue from Contracts with Customers,* the incremental transaction price described in the paragraph above was recorded as deferred revenue given that the Company identified one single combined performance obligation, which includes the licenses to the New Variants, research services and participation in the joint steering committee (“JSC”). Revenue is being recognized using the input method based on actual costs incurred as a percentage of total budgeted costs as the Company completes its performance obligation. The Company completed its performance obligation during the third quarter of 2023 and the deferred revenue was recognized as revenue in the same period.

The Company determined the transaction price using the risk adjusted net present value analysis (“rNPV”) methodology to value the elimination of the uniQure exclusivity clause and other material rights received by the Company, including the potential royalties the Company would receive from uniQure. The rNPVs incorporate estimates and assumptions including the number of products the Company and uniQure would develop, the risk-adjusted probability of successfully developing a biopharmaceutical product, the probability that uniQure will develop a product, the research and development costs, the potential worldwide sales and associated commercialization costs, corporate tax rate, and discount rate.

During each of the years ended December 31, 2025 and 2024, the Company recognized revenue of zero under the Amended uniQure Agreement and the Second uniQure Agreement, respectively. As of December 31, 2025 and 2024, there was no deferred revenue relating to uniQure, and the aggregate amount of the transaction price allocated to the remaining performance obligation was zero. There were no amounts due from uniQure under the uniQure Agreement, Amended uniQure Agreement or Second uniQure Agreement as of December 31, 2025 and 2024. The Amended uniQure Agreement and the Second uniQure Agreement were terminated by mutual agreement in November 2025. The Company did not incur any charges related to the termination of the uniQure Agreement.

Cystic Fibrosis Foundation (“CFF”)

In September 2016, the Company entered into an award agreement for the Optimized Adeno-Associated Virus for Lung Epithelia Gene Delivery Development Program with CFF, a non-profit organization dedicated to finding a cure for cystic fibrosis, an inherited disorder that causes disease in the pulmonary airways leading to morbidity and mortality. Under this agreement, CFF contributes funding to help advance the Company’s cystic fibrosis research program. The September 2016 grant award agreement was incorporated into a new grant award agreement with CFF in September 2017 with the same objectives, which was subsequently amended in August 2018 and February 2021. In August 2023, the Company executed a third amendment to the agreement (the “August 2023 Amendment”), which modified the research plan, increased the aggregate milestone payments from $3.5 million to $6.3 million and extended the estimated project completion date. The aforementioned September 2017 agreement and three amendments are collectively referred to as the “CFF Agreement”. The August 2023 Amendment represents a contract modification to an existing contract under ASC Topic 606, given the

amendment did not include any additional goods or services, and the remaining research activities are not distinct from those previously provided. The August 2023 Amendment did not impact the transaction price, given the increased award amount relates to variable consideration for future milestones that are fully constrained. Accordingly, the contract modification did not result in a revenue adjustment. As of December 31, 2025 and 2024, the Company had achieved cumulative milestones totalling $1.8 million, under the CFF Agreement. The remaining award amount will be paid by CFF based on achievement of certain development milestones by the Company.

The Company expects to make payments to CFF equal to six times the actual award received by the Company in three installments within the first four years of the first commercial sale of a product developed under this agreement. The Company also has agreed to make future sales-based milestone payments to CFF of up to three times the actual award received upon achieving specified commercialization milestones with respect to the first of any product developed utilizing any compound covered under the CFF Agreement. The CFF Agreement also requires the Company to pay to CFF royalties of a mid-single digit percentage, up to six times the actual award received, on any amounts received by the Company from the sale, license or transfer to a third-party of rights in the technology developed as a result of this collaboration. Any such royalty payments shall be credited against the payments owed by the Company upon first commercial sale. In the event of a change of control of the Company, CFF will receive certain payments, depending on the timing of the change of control and the size of the transaction.

To date, the Company has not developed a commercial product in connection with the CFF Agreement, and it has not licensed, sold or otherwise transferred to another party the product developed under the CFF Agreement or the underlying technology.

If at any time prior to the first commercial sale of a product developed as a result of the CFF Agreement, the Company ceases to use commercially reasonable efforts to develop or commercialize any product under the CFF Agreement for a continuous period of 180 consecutive days and fails to present a reasonable plan to resume commercially reasonable efforts, the Company will grant to CFF an irrevocable, exclusive worldwide interruption license under all of the Company's interest in the research plan technology to exploit such product. Any third-party license granted by the Company shall be subject to such interruption license.

The Company identified one performance obligation within the CFF Agreement for research activities. The CFF Agreement does not include a significant financing component.

The Company concluded that the transaction price should not include the variable consideration related to future research milestones as they were considered to be constrained as it is probable that the inclusion of such variable consideration could result in a significant reversal of cumulative revenue in the future. The Company re-evaluates the transaction price and estimated period of performance at each reporting period.

Revenue recognized during the year ended December 31, 2025 was $0.2 million, while revenue recognized during the year December 31, 2024 was immaterial. As of December 31, 2025 and 2024, deferred revenue relating to the CFF Agreement was $1.1 million and $1.3 million, respectively. There were no accounts receivable from CFF under the CFF Agreement as of December 31, 2025 and 2024. As of December 31, 2025 and 2024, the aggregate amount of the transaction price allocated to the remaining performance obligation was $1.1 million and $1.3 million, respectively. Based on current timelines, the deferred revenue is expected to be recognized as revenue over the next four years as the Company performs research services through the completion of IND-enabling studies.

The obligation to make payments to CFF upon a change of control meets the definition of an embedded derivative that is required to be bifurcated and separately accounted for as a derivative liability. See Note 14, Derivative Liability, for further discussion of the embedded derivative.

Otsuka Pharmaceutical Co., Ltd

On October 31, 2025, the Company entered into a Collaboration and License Agreement ("Otsuka Agreement") with Otsuka Pharmaceutical Co., Ltd. (“Otsuka”). Pursuant to the Otsuka Agreement, the Company granted Otsuka an exclusive royalty-bearing sublicensable license to its intellectual property to develop, manufacture and commercialize 4D-150, its lead product candidate for ophthalmological diseases, in Japan, Korea, China, Australia, and certain other Asia-Pacific markets ("Otsuka Territory"). The Company retains full development and commercialization rights for 4D-150 outside the Otsuka Territory, including the United States, Latin America, and Europe.

Otsuka will lead all regulatory and commercialization activities in the Otsuka Territory. The Company will lead all Phase 3 clinical activity globally, including within the Otsuka Territory. In aggregate, the Company is currently responsible for separate global phase 3 trials for wet age-related macular degeneration ("wet AMD") and diabetic macular edema (“DME”), local clinical trials in the Otsuka Territory as required by local regulatory authorities, and several other studies, including the related regulatory activities and long-term follow up studies. The Company and Otsuka will coordinate and review the development and other activities through a joint steering committee.

The Company also will manufacture and supply 4D-150 to Otsuka for clinical and commercial use at a supply price derived from the Company's manufacturing costs plus a margin.

The Company has received a nonrefundable upfront cash payment of $85.0 million and is eligible to receive quarterly clinical trial cost sharing and reimbursement amounts. In addition, the Company is eligible for up to $335.5 million in potential regulatory and commercial milestone payments and tiered double-digit royalties on net sales in the Otsuka Territory, and subject to royalty reductions under certain circumstances.

The Otsuka Agreement will remain in effect, unless earlier terminated, on a country-by-country basis, until the date that Otsuka is no longer developing or commercializing 4D-150 in such country within the Otsuka Territory. Otsuka may terminate the Otsuka Agreement for convenience, on a country-by-country basis, upon sufficient prior written notice as per the Otsuka Agreement, or due to safety reasons or the failure of certain of the Company’s related clinical trials to achieve their primary endpoints. The Company may terminate the Otsuka Agreement upon notice if Otsuka ceases all development activities and commercialization of 4D-150 in Japan for an agreed upon period as per the Otsuka Agreement and does not resume such activities or commercialization within a specified notice period. Upon termination, any license granted by the Company to Otsuka will terminate.

The Company concluded that Otsuka is a customer and that the arrangement represents a contract with a customer under the scope of ASC 606. The Company identified the following promised goods and services that represent performance obligations:

- the exclusive license to its intellectual property to develop, manufacture and commercialize 4D-150 in the Otsuka Territory,
- performance of separate global phase 3 trials for wet AMD and DME, local clinical trials in the Otsuka Territory as required by the local regulatory authorities, and several other studies, including the associated regulatory and joint steering committee activities. Separate performance obligations were identified for each individual trial or study.

The license was considered functional intellectual property as of the inception of the Otsuka Agreement and distinct from other promises under the contract, as Otsuka can benefit from the license on its own or together with other readily available resources. Each of the clinical trial and other study services were considered distinct as the customer can benefit from these services together with the license transferred at the inception of the Otsuka Agreement. The clinical trial and other study services will not modify or customize the initial intellectual property transferred at contract inception due to the late stage of development of the intellectual property.

The Company concluded manufacturing and supply of 4D-150 for clinical and commercial use does not represent a performance obligation, as these activities are at Otsuka's option. Product supply is priced at standalone selling prices, and therefore does not provide Otsuka with material rights.

To the extent Otsuka requests the Company to supply 4D-150, such supply will be considered a separate contract with the customer.

The initial transaction price includes the upfront cash payment and variable consideration for clinical trials and other studies performance obligations, some of which have started and others that have not yet started as of December 31, 2025. The upfront cash payment is $85 million and was received during the year ended December 31, 2025. The variable consideration in the form of the estimated cost sharing and reimbursement of approximately $40.0 million represents the amount allocated to unsatisfied or partially unsatisfied performance obligations, that have already started as of December 31, 2025, and was allocated entirely to the clinical trials and other studies performance obligations using the variable consideration allocation exception.

The regulatory milestone amounts are not currently probable and have not been included in the transaction price as the amounts are fully constrained. The sales-based commercial milestones and royalties relate to the granted intellectual property license and will be recognized when the related sales occur.

At the end of each reporting period, the Company will re-evaluate the estimated variable consideration and if necessary, adjust the transaction price.

To determine the standalone selling prices of each performance obligation, the Company used significant estimates and assumptions that include but are not limited to, expected market opportunity and pricing, expected future costs of clinical trials and other studies, and timelines and likelihood of success of clinical and regulatory activities. For the standalone selling price of the license, the Company used a discounted cash flow analysis of projected cash flows and potential revenues from the commercial sales of 4D-150 in the Otsuka Territory. To determine the standalone selling prices of the Company's obligations to conduct clinical trials and other studies, the expected cost plus margin approach was used.

Variable consideration to which the Company is entitled to is allocated directly to the associated performance obligations, as it is triggered by the Company's performance or represents specific outcomes from such performance, and the resulting allocation meets the allocation objective.

The upfront amount of $85.0 million was allocated entirely to the license performance obligation and was recognized at a point in time upon the transfer of control during the year ended December 31, 2025.

Revenue attributable to the remaining performance obligations to conduct clinical trials and other studies will be recognized over time as the underlying services are performed, over the period through the completion of program development activities. Progress is measured using an input method based on cumulative cost incurred relative to the total estimated cost of the performance obligation. Estimated progress and the underlying costs will be reviewed and adjusted as necessary at every reporting date. Revenue from clinical trials and other studies performance obligations was immaterial during the quarter and the year ended December 31, 2025.

The transaction price amount allocated to unsatisfied or partially unsatisfied performance obligations, which have started as of December 31, 2025 was approximately $40.0 million, expected to be recognized during 2026 through 2032 as clinical trials and other studies continue. Certain performance obligations have not started as of December 31, 2025 and the related amounts are not included above.

7. License Arrangements

Astellas Gene Therapies, Inc.

On July 5, 2023, the Company entered into a licensing agreement (the "Astellas License Agreement") with Astellas Gene Therapies, Inc. ("AGT"), pursuant to which the Company granted to AGT a license to utilize its intravitreal R100 vector ("4D Vector") to develop and commercialize licensed compounds and licensed products for one genetic target implicated in rare monogenic ophthalmic disease(s), with options to add up to two additional targets implicated in rare monogenic ophthalmic diseases after paying additional option exercise fees. Under the terms of the Astellas License Agreement, the Company has provided its 4D vector technology to AGT to deliver AGT's genetic payloads for the treatment of rare monogenic diseases. AGT will conduct all subsequent research, development, manufacturing, and commercialization activities. As partial consideration for the rights and licenses granted to AGT by the Company under this Astellas License Agreement, AGT paid the Company an upfront amount of $20.0 million, which was received in July 2023. The Company may receive potential future option fees and milestones of up to $942.5 million, including $42.5 million of potential future option fees, $90.0 million potential future development milestones, $120.0 million potential future regulatory milestones and $690.0 million potential future commercial sales milestones. In addition, the Company is entitled to receive mid-single digit to double-digit, sub-teen royalties on net sales of all licensed products.

Under the Astellas License Agreement, the Company's performance obligation is to grant and make available to AGT the Licensed IP and Licensed Know-How (each as defined in the Astellas License Agreement) with respect to the 4D Vector. In connection with the grant of the license, in July 2023, the Company delivered to AGT the Transferred Material (as defined in the Astellas License Agreement). This agreement was terminated by AGT in July 2025 for convenience. The Company did not incur any charges related to the termination of the Astellas License Agreement. As of December 31, 2025, there was no deferred revenue and no accounts receivable relating to the Astellas License Agreement.

Aevitas Therapeutics, Inc. and The Trustees of the University of Pennsylvania

On April 21, 2023, the Company entered into an agreement (the "Aevitas Agreement") with Aevitas Therapeutics, Inc. ("Aevitas"), pursuant to which the Company acquired all of Aevitas' worldwide rights to short-form human complement factor H (sCFH), which the Company plans to use for its 4D-175 product candidate research program. The asset purchase was accounted for as an asset acquisition. As consideration for the Aevitas Agreement, the Company shall pay Aevitas up to approximately $144.1 million in cash upon certain late-stage milestones being achieved, including $7.2 million for development milestones, $68.0 million for regulatory milestones and $68.9 million for sales milestones plus royalties in the low single digits range on sales of 4D-175. In addition, as part of the Aevitas Agreement, the Company was assigned a License Agreement for sCFH with the Trustees of the University of Pennsylvania, under which the Company shall pay the University of Pennsylvania up to approximately $41.6 million in cash upon certain late-stage milestones being achieved, including $1.9 million development, $21.5 million regulatory and $18.2 million sales milestones plus royalties in the low single digits range on sales of 4D-175. No upfront consideration was paid under the Aevitas Agreement.

As of December 31, 2025, the Company has not recorded a liability related to contingent consideration for future milestone and royalty payments to either Aevitas or the University of Pennsylvania, as the achievement of such milestones has not occurred and was not deemed probable and product sales have not commenced.

Regents of the University of California

The Company has exclusive, worldwide license agreements (the "UC Agreements") with the Regents of the University of California (the "UC Regents") relating to the use of certain patents and intellectual property surrounding its core technologies, including Therapeutic Vector Evolution. Pursuant to each of the UC Agreements executed prior to January 2019, the Company was obligated to pay a (i)

non-refundable license fee of $5,000 upon execution, (ii) a non-refundable license fee of $5,000 each year thereafter, until sales of a licensed product are made and royalties are paid to the UC Regents, (iii) reimbursement of domestic and foreign patent filing, prosecution and maintenance fees, and (iv) either $50,000 or issuance of a 3% equity interest in the Company upon the closing of the first qualified financing at the option of the UC Regents. The Company's first qualified financing occurred in 2015 and at the election of the UC Regents, the Company issued the UC Regents in January 2016 an amount of common stock equal to 6% of the equity interests in the Company pursuant to the applicable clause in each of the UC Agreements.

Pursuant to an agreement with the UC Regents executed in January 2019 the Company paid a non-refundable license fee of $50,000 to the UC Regents upon execution of the agreement. The Company is obligated to pay a non-refundable license fee of $5,000 on the one-year anniversary of the contract effective date and each year thereafter, until sales of a licensed product are made and royalties are paid to the UC Regents.

In addition, the Company is obligated to make certain contingent payments including (i) development milestones up to $3.1 million, (ii) low single digit royalties on the net sales of its developed products that consist of a minimum annual royalty of up to $0.1 million per year for the term of the agreement beginning in the first calendar year after the year in which net sales first occurred, and (iii) sublicense consideration in the mid-teens to the mid-twenties-range on any future sublicensing arrangements the Company may enter into with third-party licensees.

As of December 31, 2025, the Company has not recorded a liability related to contingent consideration for future milestone and royalty payments to UC Regents, as the achievement of such milestones has not occurred and was not deemed probable and product sales have not commenced.

8. Commitments and Contingencies

Operating Lease Commitments

5980 Horton Street Building Lease

In May 2015, the Company executed a lease agreement (the "5980 Horton Lease") for office and laboratory space in Emeryville, California. The 5980 Horton Lease, as amended, expires in August 2026. As of December 31, 2025, the right-of-use asset and lease liability related to the 5980 Horton Lease were $0.3 million and $0.4 million, respectively. As of December 31, 2024, the right-of-use asset and lease liability related to the 5980 Horton Lease were $0.8 million and $0.9 million, respectively.

5858 Horton Street Lease and Expansion

In October 2018, the Company executed a lease agreement (the "5858 Horton Lease") for office and laboratory facilities in Emeryville, California. The 5858 Horton Lease, as amended in 2019, 2021 and 2022, consists of approximately 40,802 square feet of space and has a lease term through December 31, 2029. In July 2024, the Company extended the term of the 5858 Horton Lease for a period of twelve months to December 31, 2030. In accordance with ASC Topic 842, *Leases*, the Company accounted for the extension as a modification and remeasured the lease liability based on the new lease term and an updated, estimated incremental borrowing rate of 10.75%. The modification resulted in an increase to the lease liability of $0.8 million and a corresponding increase to the carrying value of the right-of-use asset. No gain or loss was recognized upon the modification. As of December 31, 2025, the right-of-use asset and lease liability related to the 5858 Horton Lease was $8.8 million and $11.2 million, respectively. As of December 31, 2024, the right-of-use asset and lease liability related to the 5858 Horton Lease were $9.9 million and $12.6 million, respectively.

In July 2024, the Company also entered into a lease agreement for additional office and laboratory space in Emeryville, California (the "5858 Horton Expansion Lease"). The 5858 Horton Expansion Lease consists of approximately 32,038 square feet of space and commenced on September 1, 2024 and has a

lease term through December 31, 2030. As of December 31, 2025, the right-of-use asset and lease liability related to the 5858 Horton Expansion Lease were $7.8 million and $8.6 million, respectively. As of December 31, 2024, the right-of-use asset and lease liability related to the 5858 Horton Expansion Lease were $8.9 million and $9.6 million, respectively. The discount rate used to measure the lease liability was 11.02%.

Emeryville Warehouse Lease

In January 2024, the Company entered into a lease agreement for warehouse space in Emeryville, California (the "Warehouse Lease"). The Warehouse Lease commenced on August 1, 2024. The Warehouse Lease consists of approximately 7,800 square feet of warehouse space and has a lease term through December 31, 2029. As of December 31, 2025, the right-of-use asset and lease liability related to the Warehouse Lease were each $1.2 million. As of December 31, 2024, the right-of-use asset and lease liability related to the Warehouse Lease were each $1.5 million. The discount rate used to measure the lease liability related to the Warehouse Lease was 10.69%.

The following table summarizes the components of lease expense for the years ended December 31, 2025 and 2024, which are included in operating expenses in the Company's statements of operations (in thousands):

	Year Ended December 31,	
	2025	2024
Operating lease cost	$ 5,375	$ 3,696
Variable lease cost	2,764	1,829
Total	$ 8,139	$ 5,525

Variable lease payments include amounts relating to common area maintenance and are recognized in the statements of operations as incurred.

Cash paid for amounts included in the measurement of the Company's operating lease liabilities and presented within cash used in operating activities in the statements of cash flows was $5.6 million and $3.3 million for the years ended December 31, 2025 and 2024, respectively.

The following table summarizes supplemental information related to operating leases:

	Year Ended December 31,	
	2025	2024
Weighted-average remaining lease term (in years):	4.8	5.7
Weighted-average discount rate:	10.8%	10.7%

The following table summarizes the maturities of lease liabilities as of December 31, 2025 (in thousands):

2026	$ 5,601
2027	5,350
2028	5,510
2029	5,675
2030	5,455
Total future minimum lease payments	27,591
Less: Amount representing interest	(6,178)
Present value of future minimum lease payments	21,413
Less: Current portion of operating lease liabilities	(5,592)
Long-term portion of operating lease liabilities	$ 15,821

Indemnification Agreements

In the ordinary course of business, the Company enters into agreements that may include indemnification provisions, such as with vendors and other parties. Pursuant to such agreements, the Company may indemnify, hold harmless and defend an indemnified party for losses suffered or incurred by the indemnified party. Some of the provisions will limit losses to those arising from third-party actions. In some cases, the indemnification will continue after the termination of the agreement. The maximum potential amount of future payments the Company could be required to make under these provisions is not determinable. The Company has never incurred material costs to defend lawsuits or settle claims related to these indemnification provisions. The Company has also entered into indemnification agreements with its directors and officers that require the Company, among other things, to indemnify them against certain liabilities that may arise by reason of their status or service as directors or officers to the fullest extent permitted by Delaware corporate law. The Company currently maintains directors' and officers' liability insurance that would generally enable it to recover a portion of any future amounts paid. The Company believes the estimated fair value of its indemnification agreements in excess of applicable insurance coverage is not material.

Legal Proceedings

From time to time, the Company may become involved in legal proceedings arising from the ordinary course of its business. If applicable, the Company records a legal liability when it believes that it is both probable that a liability may have been incurred, and the amount of the liability can be reasonably estimated. Significant judgment by the Company is required to determine both probability and the estimated amount. There are no material legal proceedings outstanding at December 31, 2025.

9. Income Taxes

The Company did not record any income tax expense during the years ended December 31, 2025 and 2024. The Company has a net operating loss and has provided a valuation allowance against net deferred tax assets due to uncertainties regarding the Company's ability to realize these assets. All losses before income taxes arose in the United States.

The Company adopted ASU No. 2023-09 for the 2025 calendar year prospectively. The effective tax rate of the Company's income tax expense (benefit) differs from the federal statutory rate pursuant to the disclosure requirements of ASU No. 2023-09 for the year ended December 31, 2025 as follows (in thousands):

	Year Ended December 31, 2025	
	Amount	Percent
US federal statutory income tax rate	$ (29,423)	21.0%
Research tax credit	(3,309)	2.4%
Change in valuation allowance	29,664	(21.2)%
Nondeductible items:		
Stock-based compensation	2,509	(1.8)%
Officer's compensation	363	(0.3)%
Permanent differences	196	(0.1)%
Provision for income taxes / Effective tax rate	$ —	0.0%

The effective tax rate of the Company's income tax expense (benefit) differs from the federal statutory rate for the year ended December 31, 2024 as follows:

	Year Ended December 31, 2024
Federal statutory income tax rate	21.0%
State tax rate	(7.6)%
Research tax credit	(4.8)%
Permanent differences	(0.1)%
Stock-based compensation	(0.5)%
Officer's compensation	(1.4)%
Valuation allowance	(6.6)%
Provision for income taxes	0.0%

The tax effects of temporary differences that give rise to significant components of the deferred taxes are as follows (in thousands):

	December 31,	
	2025	2024
Deferred Tax Assets		
Net operating loss carryforwards	$ 74,366	$ 72,385
Deferred revenue	232	254
Research tax credits	11,372	7,235
Stock-based compensation expense	6,777	5,336
Intangible asset basis	618	689
Operating lease liabilities	4,502	5,168
Capitalized research expenditures	62,343	40,345
Other	3,490	2,321
Total deferred tax assets	$ 163,700	$ 133,733
Deferred Tax Liabilities		
Operating lease right-of-use assets	$ (3,814)	$ (4,426)
Prepaid expenses	(1,331)	(1,223)
Total deferred tax liabilities	$ (5,145)	$ (5,649)
Less: valuation allowance	(158,555)	(128,084)
Total net deferred tax	$ —	$ —

The Company's valuation allowance increased by $30.5 million during the year ended December 31, 2025 and $10.6 million during the year ended December 31, 2024. The increase in the valuation allowance for each of the years ended December 31, 2025 and 2024 was primarily driven by net losses incurred, capitalized research expenditures, stock-based compensation expense and tax credits generated within the U.S.

The Company had federal net operating loss ("NOL") carryforwards of $307.6 million and $298.3 million as of December 31, 2025 and 2024, respectively, of which $9.5 million will begin to expire in 2037 and $298.1 million can be carried forward indefinitely. The Company had state NOL carryforwards of $142.3 million and $142.2 million as of December 31, 2025 and 2024, respectively. The state NOL carryforwards will begin to expire in 2036.

As of December 31, 2025 and 2024, the Company had federal research and development credit carryforwards of $9.9 million and $3.3 million, respectively, and California research and development credit carryforwards of $14.6 million and $12.5 million, respectively. The federal credit carryforwards begin to expire in 2044, and the California credits can be carried forward indefinitely.

Utilization of the NOL carryforwards and research credit carryforwards may be subject to an annual limitation due to the ownership percentage change limitations provided by the Internal Revenue Code Sections 382 and 383, and similar state provisions. Annual limitations may result in the expiration of the NOL and tax credit carryforwards before they are utilized. The Company has experienced ownership changes in the past. As a result of the ownership changes, approximately $21.1 million of the federal research and development credits are permanently limited and will expire unused for federal income tax purposes, and such amounts are excluded from the federal research and development credit carryforwards as of 2024. Subsequent ownership changes may result in additional limitations.

A reconciliation of the beginning and ending unrecognized tax benefits amounts is as follows (in thousands):

	Unrecognized Income Tax Benefits
Balance as of December 31, 2023	$ 11,902
Additions for current year tax positions	2,914
Reductions for tax positions of prior years	(7,738)
Balance as of December 31, 2024	7,078
Additions for current year tax positions	4,357
Reductions for tax positions of prior years	—
Balance as of December 31, 2025	$ 11,435

The unrecognized tax benefits would not impact the Company's effective tax rate if recognized. During the years ended December 31, 2025 and 2024, the Company did not recognize accrued interest and penalties related to unrecognized tax benefits.

The Company files income tax returns in the U.S. federal and certain state tax jurisdictions. For jurisdictions in which tax filings have been filed, all tax years remain open for examination by the federal and state authorities for three and four years, respectively, from the date of utilization of any net operating losses or credits. The Company did not make any material federal and state tax payments during the years ended December 31, 2025 and 2024. The Company has no ongoing income tax examinations by tax authorities at this time.

On July 4, 2025, the One Big Beautiful Bill Act (the "OBBB Act") was enacted, introducing amendments to U.S. tax laws with various effective dates from 2025 to 2027. The OBBB Act modified certain business deductions, including an immediate deduction for domestic research and development expenditures, and restoration of 100% bonus depreciation. The OBBB Act did not result in a material impact to the Company's income tax provision or effective tax rate.

10. Common Stock

As of December 31, 2025 and 2024, the Company's certificate of incorporation authorized the Company to issue 300,000,000 shares of common stock, at the par value of $0.0001 per share. The holder of each share of common stock is entitled to one vote per share.

Common stockholders are entitled to dividends if and when declared by the board of directors, subject to the prior rights of the preferred stockholders. As of December 31, 2025 and 2024, no dividends on common stock had been declared by the board of directors.

The Company has reserved common stock, on an as-converted basis, for future issuance as follows:

	December 31,	
	2025	2024
Issuance of common stock under the 2020 Equity Incentive Award Plan and 2025 Employment Inducement Award Plan	2,506,434	975,060
Issuance of common stock under the 2020 Employee Stock Purchase Plan	182,775	192,598
Exercise of stock options issued and outstanding and future vesting of restricted stock units	10,157,578	9,698,997
Exercise of common stock warrants	10,365,665	9,947,145
Total common stock reserved for future issuance	23,212,452	20,813,800

Funding Agreement with CFF — In April 2020, CFF made a $10.0 million investment in the Company's Series C redeemable convertible preferred stock financing. In return for the investment, CFF received shares of Series C redeemable convertible preferred stock, and the Company and CFF entered into a Funding Agreement (the "Funding Agreement"). Pursuant to the terms of the Funding Agreement, except in the event of a technical failure, the $10.0 million received from CFF will be used to advance the development program for 4D-710, the Company's lead product in cystic fibrosis, or any other therapeutic approved by the Program Advisory Group ("PAG") to alleviate pulmonary complications of cystic fibrosis (the "Funding Agreement Product").

CFF committed to provide an additional $4.0 million of funding upon acceptance of an IND application or its equivalent to allow for human testing of the Funding Agreement Product ("Acceptance").

In October 2021, the IND was cleared by the U.S. Food and Drug Administration and CFF made the additional investment of $4.0 million in cash for the issuance of 125,715 shares of the Company's common stock to CFF.

The Company was committed to providing an amount equal to the funding provided by CFF to be used solely to advance the Funding Agreement Product. As of December 31, 2025, the funding commitment has been fulfilled. Under the terms of the Funding Agreement, neither the $10.0 million investment in the Series C redeemable convertible preferred stock, which converted to common stock as of December 31, 2020, nor the $4.0 million of funding upon Acceptance are restricted as to withdrawal or usage.

CFF purchased 776,398 shares of the Company's common stock for $7.5 million in October 2025. The Company will use the proceeds of this investment to support continued development of 4D-710. The Company also agreed with CFF to form a Joint Steering Committee, with senior clinical development and regulatory expertise to enhance strategic planning, guidance, and coordination of 4D-710's development. This agreement between CFF and the Company in October 2025 also provides that CFF will invest an additional $3.6 million in exchange for shares of the Company's common stock subject to achievement of specific clinical milestones and at the option of the Company. This agreement between the Company and CFF in October 2025 does not modify the prior agreements with CFF.

Sales Agreement with Jefferies LLC ("Jefferies") — In March 2022, the Company entered into an Open Market Sales Agreement (the "Jefferies Sales Agreement") with Jefferies as sales agent to sell shares of the Company's common stock, from time to time, with aggregate gross sales proceeds of up to $100.0 million pursuant to the S-3 Registration Statement as an "at-the-market" ("ATM") offering under the Securities Act (the "2022 ATM Offering Program"). During the year ended December 31, 2024, 535,938 shares of the Company's common stock had been sold pursuant to the Jefferies Sales Agreement for net proceeds to the Company of $15.3 million, after deducting issuance costs. On May 31, 2024, the Company terminated the Jefferies Sales Agreement and the 2022 ATM Offering Program pursuant to the terms of the Jefferies Sales Agreement. As of the point of termination, 1,684,550 shares

of the Company's common stock had been sold pursuant to the Jefferies Sales Agreement for net proceeds to the Company of $34.4 million, after deducting issuance costs.

Sales Agreement with Leerink Partners LLC ("Leerink") — In June 2024, the Company entered into a Sales Agreement (the "Leerink Sales Agreement") with Leerink as sales agent to sell shares of the Company's common stock, from time to time, with aggregate gross sales proceeds of up to $250.0 million pursuant to a Registration Statement on Form S-3 that the Company filed with the SEC in February 2024, and subsequently amended in February 2025, as an ATM offering under the Securities Act. For the year ended December 31, 2025, 1,175,000 shares of the Company's common stock were sold pursuant to the Leerink Sales Agreement for net proceeds to the Company of $9.6 million, after deducting issuance costs. For the year ended December 31, 2024, no shares had been sold pursuant to the Leerink Sales Agreement.

11. Stock-based Compensation

2025 Employment Inducement Award Plan

On February 3, 2025, the Company's board of directors adopted the 2025 Employment Inducement Plan (the "Inducement Plan") pursuant to which the Company reserved 500,000 shares of its common stock to be used exclusively for grants of awards to individuals who were not previously employees or directors, as an inducement material to the individual's entry into employment with the Company within the meaning of Rule 5635(c)(4) of the Marketplace Rules of the Nasdaq Stock Market. The Inducement Plan provides for the grant of stock options, restricted stock units, and other stock-based awards. As of December 31, 2025, there were 262,650 shares available for future grants under the Inducement Plan.

2020 Incentive Award Plan

In December 2020, the Company adopted the 2020 Incentive Award Plan ("2020 Plan"), which became effective on December 10, 2020. The 2020 Plan initially reserved 2,606,546 shares of common stock for the issuance of stock options, stock appreciation rights, restricted stock awards, restricted stock units, performance bonus awards, performance stock units, dividend equivalents or other stock or cash based award granted to employees, directors and consultants of the Company. The number of shares reserved for future issuance under the 2020 Plan will increase annually on the first day of each fiscal year beginning in 2021 and ending in 2030 by the lesser of (i) 5% of the shares of common stock outstanding (on an as converted basis) on the last day of the immediately preceding fiscal year and (ii) such number of shares of common stock as determined by the Company's board of directors, provided, however, no more than 18,000,000 shares of the Company's common stock may be issued upon the exercise of incentive stock options. As a result of the operation of the automatic annual increase provision of the 2020 Plan, an additional 2,153,533 shares of common stock became available for issuance on February 29, 2024 and an additional 2,289,625 shares of common stock became available for issuance on February 28, 2025, under the 2020 Plan. All stock options are exercisable over a period not to exceed the contractual term of ten years from the date the stock options were issued. As of December 31, 2025, there were 2,243,784 shares available for grant under the 2020 Plan.

Following the effectiveness of the 2020 Plan, the Company will not make any further grants under the 2015 Equity Incentive Plan (the "2015 Plan"). However, the 2015 Plan continues to govern the terms of stock options that remain outstanding under the 2015 Plan.

2015 Equity Incentive Plan

The 2015 Plan provided for grants of stock options, stock appreciation rights, restricted stock and restricted stock unit awards to employees, directors and consultants of the Company. As of December 31, 2025, stock options to purchase 1,346,450 shares of common stock were outstanding under the 2015 Plan. All stock options are exercisable over a period not to exceed the contractual term of ten years from

the date the stock options were issued and are granted at prices not less than the estimated fair market value of the Company's common stock on the grant date as determined by the board of directors.

No additional grants will be made under the 2015 Plan, and all outstanding grants under the 2015 Plan that are repurchased, forfeited, expire or are cancelled are returned to the 2015 Plan and are not available for grant under the 2020 Plan.

Employee Stock Purchase Plan

In December 2020, the Company adopted the 2020 Employee Stock Purchase Plan (the "2020 ESPP"). Under the 2020 ESPP, 252,337 shares of the Company's common stock were initially reserved for employee purchases of the Company's common stock under terms and provisions established by the Company's board of directors and approved by the Company's stockholders. The number of shares reserved for future issuance under the 2020 ESPP will increase annually on the first day of each fiscal year beginning in 2021 and ending in 2030 by the lesser of (i) 1% of the shares of common stock outstanding (on an as converted basis) on the last day of the immediately preceding fiscal year and (ii) such number of shares of common stock as determined by the Company's board of directors, provided, however, no more than 15,000,000 shares the Company's common stock may be issued under the 2020 ESPP. As a result of the operation of this annual increase provision of the 2020 ESPP, an additional 50,000 shares of common stock became available on February 29, 2024 and an additional 150,000 shares of common stock became available for issuance on February 28, 2025, under the 2020 ESPP.

Under the 2020 ESPP, the Company's employees may purchase common stock through payroll deductions at a price equal to 85% of the lower of the fair market value of the stock at the beginning of the offering period or at the end of each applicable purchase period. The 2020 ESPP provides for a series of overlapping 24-month offering periods comprising four six-month purchase periods. The initial offering period under the 2020 ESPP is longer than 24 months, commencing February 15, 2021 and ending on May 14, 2023. Contributions under the 2020 ESPP are limited to a maximum of 15% of an employee's eligible compensation.

Restricted Stock Units

The Company has granted restricted stock unit ("RSU") awards under the 2020 Plan and the Inducement Plan that vest over a period of four years. The following table summarizes the RSU activity:

	Number of Shares	Weighted Average Grant Date Fair Value	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Unvested balance at December 31, 2024	361,997	$ 16.87	1.76	$ 2,016
Awarded	742,354	5.34		
Vested	(158,231)	12.45		
Canceled/Forfeited	(201,350)	10.03		
Unvested balance at December 31, 2025	744,770	$ 8.16	1.70	$ 5,586

Stock Options

The following table summarizes the stock options activity:

	Options Outstanding			
	Number of Shares Underlying Outstanding Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Outstanding at December 31, 2024	9,337,000	$ 16.39	7.44	$ 342
Options granted	2,395,799	5.84		
Options exercised	(163,103)	6.03		
Options expired	(652,859)	16.77		
Options forfeited	(1,504,029)	12.19		
Outstanding at December 31, 2025	9,412,808	$ 14.53	6.12	$ 4,560
Shares exercisable, December 31, 2025	5,727,476	$ 16.90	4.91	$ 999
Shares vested and expected to vest, December 31, 2025	9,412,808	$ 14.53	6.12	$ 4,560

The following table is a summary of stock compensation expense for employees and nonemployees by function (in thousands):

	Year Ended December 31,	
	2025	2024
Research and development	$ 11,831	$ 13,819
General and administrative	10,185	12,297
Total stock-based compensation expense	$ 22,016	$ 26,116

The total intrinsic value of stock options exercised was $0.7 million and $5.6 million for the years ended December 31, 2025 and 2024, respectively. During the years ended December 31, 2025 and 2024, the Company granted 2,384,549 and 1,821,891 stock options to employees with a weighted-average grant date fair value of $4.42 and $19.32 per share, respectively. During the years ended December 31, 2025 and 2024, the Company granted 11,250 and 12,000 stock options to nonemployees with a weighted-average grant date fair value of $2.04 and $18.55 per share, respectively. As of December 31, 2025, the unrecognized stock-based compensation expense of unvested stock options and RSUs was $34.2 million and is expected to be recognized over a weighted-average period of 1.7 years.

There were no share-based liabilities paid during the years ended December 31, 2025 and 2024.

Stock-based compensation expense recorded for employees was $20.3 million and $24.4 million for the years ended December 31, 2025 and 2024, respectively. Stock-based compensation expense

recorded for nonemployee consultants was $1.7 million for each of the years ended December 31, 2025 and 2024.

The Company estimates the fair value of employee and nonemployee stock options using the Black-Scholes option pricing model. The fair value of employee and nonemployee stock options is recognized on a straight-line basis over the requisite service period of the awards. The fair value of the Company's stock options was estimated using the following assumptions for the years ended December 31, 2025 and 2024:

	Year Ended December 31,	
	2025	2024
Expected term	5.9 - 6.1 years	5.9 - 6.1 years
Expected volatility	84.9% - 91.1%	85.8% - 88.1%
Risk-free interest rate	3.7% - 4.6%	3.9% - 4.4%
Expected dividend yield	—%	—%

Expected Term. The expected term for employee stock options is calculated using the simplified method as the Company does not have sufficient historical information to provide a basis for this estimate. The simplified method is based on the average of the vesting tranches and the contractual life of each grant. The expected term for nonemployee stock options is the contractual term of the options.

Expected Volatility. The expected volatility is based on a mix of the Company's historical volatility and the historical volatility of comparable companies with similar attributes to the Company, including industry, stage of life cycle, size and financial leverage. For each grant, the Company measured historical volatility over a period equivalent to the expected term.

Risk-free Interest Rate. The risk-free interest rate is based on the yield available on U.S. Treasury zero-coupon issues whose term is similar in duration to the expected term of the respective stock option.

Expected Dividend Yield. The Company has not paid and does not anticipate paying any dividends on its common stock in the future. Accordingly, the Company has estimated the dividend yield to be zero percent.

12. Common Stock Warrants

In May 2018, the Company issued a warrant for 23,669 shares of the Company's common stock to a service provider with an exercise price of $3.19 per share. The fair value of the warrant was determined at the issuance date using the Black-Scholes option pricing model. The warrant was fully vested upon issuance and was exercised in May 2025 through a cashless exchange under the terms of the original agreement.

In December 2020, the Company issued a warrant for 30,000 shares of the Company's common stock to a service provider with an exercise price of $18.00 per share. This warrant vests over a period of four years and expires in 2027. The fair value of the warrant was determined at the issuance date using the Black-Scholes option pricing model.

The Company recognized no expense related to the above warrant shares during the year ended December 31, 2025. The Company recorded less than $0.1 million expense for the above warrants within operating expenses in the statements of operations during the year ended December 31, 2024.

In February 2024, the Company completed an underwritten public follow-on offering which included the sale of pre-funded warrants (the "Pre-funded Warrants") to purchase 3,583,476 shares of the Company's common stock at an offering price of $29.4999. The exercise price of each Pre-funded Warrant is $0.0001 per share, and each Pre-funded Warrant is exercisable from the date of issuance. The Pre-funded Warrants are classified as a component of stockholders' equity within additional paid-in-

capital. The Company valued the Pre-funded Warrants at issuance and recorded net proceeds of $99.4 million, after deducting underwriters fees, during the year ended December 31, 2024 related to the sale of the Pre-funded Warrants. In February 2025, two holders of the Pre-funded Warrants gave notice of exercise to purchase an aggregate of 508,476 shares of the Company's common stock in a cashless exchange under the terms of the Pre-funded Warrants.

In November and December 2024, the Company entered into exchange agreements (the "Exchange Agreements") with each of Biotechnology Value Fund, L.P. and certain of its affiliates (collectively, "BVF") and RA Capital Healthcare Fund, L.P. ("RA Capital"), respectively. Pursuant to Exchange Agreements, BVF and RA Capital exchanged 5,775,000 and 535,000 shares, respectively, of the Company's common stock for pre-funded warrants to acquire the same respective number of shares of the Company's common stock. The pre-funded warrants have an exercise price of $0.0001 per underlying share of common stock, are exercisable at any time until they are fully exercised and will not expire until they are fully exercised. The Pre-funded Warrants are classified as a component of stockholders' equity within additional paid-in-capital. The number of shares of the Company's common stock issuable upon exercise of each pre-funded warrant is subject to appropriate adjustment in the event of certain stock dividends and distributions, stock splits, stock combinations, reclassifications or similar events affecting shares of the Company's common stock, as well as upon any distribution of assets, including cash, stock or other property, to the Company's stockholders. The fair value of the common stock exchanged approximated the fair value of the pre-funded warrants issued as of the transaction dates and no net proceeds were recorded in connection with the transactions. On December 22, 2025, BVF gave notice of exercise to purchase an aggregate of 178,280 shares of the Company's common stock in a cashless exchange under the terms of the pre-funded warrants.

In November 2025, the Company completed the 2025 Offering which included the sale of pre-funded warrants to purchase 1,128,949 shares of the Company's common stock at an offering price of $10.5099 per underlying share. The exercise price of each pre-funded warrant is $0.0001 per share, and each pre-funded warrant is exercisable from the date of issuance. The pre-funded warrants are classified as a component of stockholders' equity within additional paid-in-capital. The Company valued the pre-funded warrants at issuance and recorded net proceeds of $11.2 million, after deducting underwriters fees, during the year ended December 31, 2025.

13. Net Loss Per Share, Basic and Diluted

The following table sets forth the computation of basic and diluted net loss per share (in thousands, except share and per share data):

	Year Ended December 31,	
	2025	2024
Numerator		
Net loss	$ (140,109)	$ (160,868)
Denominator		
Weighted-average shares outstanding used in computing net loss per share, basic and diluted	57,930,180	53,943,741
Net loss per share, basic and diluted	$ (2.42)	$ (2.98)

In February 2024, the Company issued and sold pre-funded warrants to purchase 3,583,476 shares of common stock at a nominal exercise price of $0.0001. In November and December 2024, the Company entered into Exchange Agreements with BVF and RA Capital to exchange 5,775,000 and 535,000 shares, respectively, of the Company's common stock for pre-funded warrants to acquire the same respective number of shares of the Company's common stock. The pre-funded warrants have an exercise price of $0.0001 per underlying share of common stock. In November 2025, the Company issued and sold pre-funded warrants to purchase 1,128,949 shares of the Company's common stock. The pre-funded warrants have an exercise price of $0.0001 per underlying share of common stock (see Note 12, Common Stock Warrants). The shares of common stock into which the Pre-funded Warrants may be

exercised are considered outstanding for the purposes of computing earnings per share, because the shares may be issued for little or no consideration, they are fully vested and the Pre-funded Warrants are immediately exercisable upon their issuance date.

The following outstanding shares of potentially dilutive securities were excluded from the computation of diluted net loss per share for the periods presented because including them would have been antidilutive:

	December 31,	
	2025	2024
Options issued and outstanding	9,412,808	9,337,000
Restricted stock units subject to future vesting	744,770	361,997
2020 ESPP	364,443	774,897
Common stock warrants	30,000	53,669
Total	10,552,021	10,527,563

14. Derivative Liability

The Company identified an embedded derivative resulting from the change of control provision in the CFF Agreement. Embedded derivatives that are required to be bifurcated from the underlying host instrument are accounted for and valued as separate financial instruments. At the inception of the derivative in 2017, the Company recognized this derivative as a liability and revenue was reduced by the initial fair value of the derivative liability. The Company remeasures the derivative liability to fair value at each reporting period and records the change in fair value of the derivative liability as other income (expense), net. The Company uses a present value analysis with multiple scenarios, which incorporates assumptions and estimates to value the derivative instrument. The Company assesses these assumptions and estimates on a periodic basis as additional information impacting the assumptions is obtained. Estimates and assumptions impacting the fair value measurement include the change of control payment to CFF (range of zero to $18.9 million at December 31, 2025 and 2024), the probability of a change of control event (range of 5.0% to 50.0% at December 31, 2025 and 2024), the probability of the product achieving development or commercial status at time of change of control (range of 4.8% to 17.2% at December 31, 2025 and 2024) and the discount rate (15% at December 31, 2025 and 2024). The Company determined the estimated fair value of this liability as of the inception date of the CFF Agreement and concluded that the amount was immaterial. The Company determined the fair value of this derivative liability was $0.4 million as of each of December 31, 2025 and 2024.

15. Related Party Transactions

In March 2024, the Company entered into a research and option agreement (the “Reignite Agreement”) with Reignite Therapeutics Inc. (“Reignite”), which was founded by David Kirn, M.D., Chief Executive Officer of the Company. Reignite has the expertise to develop high-capacity, helper-dependent adenovirus capsids which the Company plans to utilize as they expand their therapeutic capsid evolution platform. Reignite and the Company plan to collaborate on a one-to-two year program to develop these high capacity, helper-dependent adenovirus capsids. Under the Reignite Agreement, the Company shall have the final authority to amend and make updates to the plan and budget of the program. Further, the Company is responsible for the funding of the related research which includes the budgeted full-time employees and CRO costs, equipment costs not to exceed $60 thousand and all other costs, in total not to exceed $1.5 million in any year of the program. The Company will have an option to acquire up to three capsids resulting from the program. The Company shall pay to Reignite an option exercise fee of $1.0 million per selected capsid for which the Company has exercised its option. The maximum total amount payable is $3.0 million.

During the years ended December 31, 2025 and 2024, the Company paid Reignite $1.1 million and $0.8 million, respectively, for research and development expenses. As of December 31, 2025, the

Company owes $0.2 million to Reignite for unpaid research and development expense. No option exercise fees were incurred during year ended December 31, 2025.

In 2024, an immediate family member of the Company's President and Chief Operating Officer was employed in the Company's Information Technology department. During the year ended December 31, 2025, the Company paid an immaterial amount of compensation and granted equity awards consisting of RSUs and stock options with an immaterial aggregate grant date fair value.

16. 401(k) Plan

In 2014, the Company adopted a 401(k) plan for all employees who have met certain eligibility requirements. The 401(k) plan allows employees to make pre-tax and post-tax contributions up to the maximum allowable amount set by the Internal Revenue Service. The Company made contributions to the 401(k) plan for all eligible participants and recorded contribution expenses of $2.2 million and $1.6 million for the years ended December 31, 2025 and 2024, respectively.

17. Segment Information

The Company operates in a single operating and reportable segment, which includes all activities related to discovery, development and commercialization of durable and disease-targeted therapeutics. The determination of a single business segment is consistent with the financial information regularly provided to the Company's chief operating decision maker (the "CODM") who manages the business activities on a consolidated basis. The Company's CODM is its Chief Executive Officer who assesses performance for the business and decides how to allocate resources based on net loss that also is reported on the statements of operations. In making this assessment, the CODM reviews and evaluates net loss to monitor budget versus actual results and to analyze cash flows for purposes of allocating resources and assessing financial performance.

In addition to the significant expense categories included within net loss presented in the Company's statements of operations, the following table provides disaggregated amounts that comprise research and development expenses (in thousands):

	Year Ended December 31,	
	2025	2024
Research and development trials and consumables expenses	$ 100,220	$ 64,757
Payroll and personnel expenses	67,345	57,383
Facilities and other research and development expenses	28,131	19,159
Total research and development expenses	$ 195,696	$ 141,299

The measure of segment assets is reported on the balance sheets as total assets. As of December 31, 2025 and 2024, all of the Company’s long-lived assets were located in the United States. The Company's revenues by geographic region, based on the location of the customer, is disclosed in Note 2, Summary of Significant Accounting Policies.

18. Restructuring and Other Charges

On July 2, 2025, the Company announced a workforce reduction of approximately 25% of current and planned roles in July 2025, primarily in the areas supporting early-stage research and development and support functions to implement a strategic pipeline prioritization to focus on the development of 4D-150 and 4D-710. The Company recorded $3.2 million for severance benefits and related termination costs included in research and development expenses in the Company's statements of operations for the year ended December 31, 2025. There are no future payments in connection with the workforce reduction.

19. Subsequent Events

On January 22, 2026, the Company entered into exchange agreements with RA Capital and BVF and its affiliates, pursuant to which RA Capital exchanged 4,850,000 shares of the Company's common stock for a pre-funded warrant to acquire 4,850,000 shares of the Company's common stock, and BVF exchanged 1,750,000 shares of the Company's common stock for a pre-funded warrant to acquire 1,750,000 shares of the Company's common stock. The pre-funded warrants have an exercise price of $0.0001 per underlying share of common stock, are exercisable at any time until they are fully exercised, and will not expire until they are fully exercised. The number of shares of the Company's common stock issuable upon exercise of the pre-funded warrants is subject to appropriate adjustment in the event of certain stock dividends and distributions, stock splits, stock combinations, reclassifications or similar events affecting the Company's shares of common stock, as well as upon any distribution of assets, including cash, stock or other property, to the Company's stockholders. The fair value of the common stock exchanged approximated the fair value of the pre-funded warrants issued as of the transaction dates and no net proceeds were recorded in connection with the transactions.