

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

FORM 10-K

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

For the Fiscal Year Ended December 31, 2021

or

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

For the Transition Period from \_\_\_\_\_ to \_\_\_\_\_.

Commission File Number 001-38114

**AVENUE THERAPEUTICS, INC.**

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of incorporation or organization)

47-4113275

(I.R.S. Employer Identification No.)

1140 Avenue of the Americas, Floor 9, New York NY 10036  
(Address of principal executive offices and zip code)

(781) 652-4500

(Registrant's telephone number, including area code)

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

(Title of Class)	Trading Symbol(s)	(Name of exchange on which registered)
Common Stock, par value \$0.0001 per share	ATXI	Nasdaq Global Market

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

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

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

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

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

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

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input checked="" type="checkbox"/>	Smaller reporting company	<input checked="" type="checkbox"/>
Emerging growth company	<input checked="" type="checkbox"/>		

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.

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

The aggregate market value of the voting stock held by non-affiliates of the registrant the last business day of the registrant's most recently completed second fiscal quarter: \$16,813,403 based upon the closing sale price of our common stock of \$2.51 on that date. Common stock held by each officer and director and by each person known to own in excess of 5% of outstanding shares of our common stock has been excluded in that such persons may be deemed to be affiliates. The determination of affiliate status is not necessarily a conclusive determination for other purposes.

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

Class of Common Stock	Outstanding Shares as of March 21, 2022
Common Stock, \$0.0001 par value	21,732,284

AVENUE THERAPEUTICS, INC.  
ANNUAL REPORT ON FORM 10-K  
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#### SPECIAL CAUTIONARY NOTICE REGARDING FORWARD-LOOKING STATEMENTS

Certain matters discussed in this report may constitute forward-looking statements for purposes of the Securities Act of 1933, as amended (the “Securities Act”) and the Securities Exchange Act of 1934, as amended (the “Exchange Act”), and involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from the future results, performance or achievements expressed or implied by such forward-looking statements. The words “anticipate,” “believe,” “estimate,” “may,” “expect” and similar expressions are generally intended to identify forward-looking statements. Our actual results may differ materially from the results anticipated in these forward-looking statements due to a variety of factors, including, without limitation, those discussed under the caption “Risk Factors,” and elsewhere in this report. All written or oral forward-looking statements attributable to us are expressly qualified in their entirety by these cautionary statements. Such forward-looking statements include, but are not limited to, statements about our:

- expectations for increases or decreases in expenses;
- expectations for the clinical and pre-clinical development, manufacturing, regulatory approval, and commercialization of our pharmaceutical product candidate or any other products we may acquire or in-license;
- our use of clinical research centers and other contractors;
- expectations for incurring capital expenditures to expand our research and development and manufacturing capabilities;
- expectations for generating revenue or becoming profitable on a sustained basis;
- expectations or ability to enter into marketing and other partnership agreements;
- expectations or ability to enter into product acquisition and in-licensing transactions;
- expectations or ability to build our own commercial infrastructure to manufacture, market and sell our product candidate;
- acceptance of our products by doctors, patients or payors;
- our ability to compete against other companies and research institutions;
- our ability to secure adequate protection for our intellectual property;
- our ability to attract and retain key personnel;
- availability of reimbursement for our products;
- estimates of the sufficiency of our existing cash and cash equivalents and investments to finance our operating requirements, including expectations regarding the value and liquidity of our investments;
- the volatility of our stock price;
- expected losses; and
- expectations for future capital requirements.

The forward-looking statements contained in this report reflect our views and assumptions as of the effective date of this report. Except as required by law, we assume no responsibility for updating any forward-looking statements.

We qualify all of our forward-looking statements by these cautionary statements.

#### SUMMARY RISK FACTORS

Our business is subject to risks of which you should be aware before making an investment decision. The risks described below are a summary of the principal risks associated with an investment in us and are not the only risks we face. You should carefully consider

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these risk factors, the risk factors described in Item 1A, and the other reports and documents that we have filed with the Securities and Exchange Commission (“SEC”).

**Risks Pertaining to the Influence of Fortress Biotech, Inc. (“Fortress”)**

- Fortress controls a voting majority of our capital stock pursuant to its ownership of a class of preferred stock, some of the features of which have been contractually suspended.

**Risks Pertaining to Our Business and Influence**

- If we fail to satisfy applicable listing standards, including compliance with the minimum market value of listed securities requirement, our common stock may be delisted from the NASDAQ Capital Market, which would impact the liquidity, and potentially the value, of your investment.
- We currently have no drug products for sale, and only one drug product candidate, Intravenous (“IV”) Tramadol. We are dependent on the success of IV Tramadol and cannot guarantee that we will receive regulatory approval, or that IV Tramadol will be successfully commercialized.
- If serious adverse or unacceptable side effects are identified during the development of IV Tramadol or any future product candidates, we may need to abandon or limit our development of some of our product candidates.
- We are an “emerging growth company” and a “smaller reporting company,” and the reduced disclosure requirements applicable to emerging growth companies and smaller reporting companies may make our common stock less attractive to investors.

**Risks Pertaining to Our Finances**

- There is substantial doubt about our ability to continue as a going concern, which may hinder our ability to obtain future financing.
- We have incurred significant losses since our inception. We expect to incur losses for the foreseeable future, and may never achieve or maintain profitability.
- We do not have any products that are approved for commercial sale and therefore do not expect to generate any revenues from product sales in the foreseeable future, if ever.
- Raising additional capital may cause dilution to our existing stockholders, restrict our operations or require us to relinquish proprietary rights.

**Risks Pertaining to Reliance on Third Parties**

- We rely, and expect to continue to rely, on third parties to conduct our preclinical studies and clinical trials, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials or complying with applicable regulatory requirements.
- We rely on clinical data and results obtained by third parties that could ultimately prove to be inaccurate or unreliable.

**Risks Pertaining to Regulatory Approval Process**

- We may not receive regulatory approval for IV Tramadol, or our approval may be significantly delayed due to scientific or regulatory reasons.
  - We may encounter U.S. Federal Drug Administration (“FDA”) deficiencies that delay our approval, or we may not obtain approval, if we do not sufficiently address the issues raised by the FDA during our meetings with the FDA, as described in the Complete Response Letters (“CRLs”), or as part of our Formal Dispute Resolution Request.
  - Even if we respond to the FDA’s requests for information and deficiencies, provide robust scientific justifications and supporting data, there is no guarantee that the FDA will accept our responses, or change its own preliminary conclusions about our product candidate.
  - Even if IV Tramadol receives regulatory approval, which may not occur, it and any other products we may market will remain subject to substantial ongoing regulatory scrutiny.
  - We will need to obtain FDA approval of any proposed product brand names, and any failure or delay associated with such approval may adversely impact our business.
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- If the Drug Enforcement Agency (“DEA”) decides to reschedule Tramadol from a Schedule IV controlled substance to a more restrictive Schedule, IV Tramadol could lose its competitive advantage, and our related clinical development and regulatory approval could be delayed or prevented.

**Risks Pertaining to the Commercialization of Product Candidates**

- Current and future legislation and regulation may increase the difficulty and cost for us to obtain marketing approval of, and to commercialize, our product candidate and may affect the prices we are able to obtain.
- Public concern regarding the safety of opioid drug products such as IV Tramadol could delay or limit our ability to obtain regulatory approval, result in the inclusion of serious risk information in our labeling, negatively impact market performance, or require us to undertake other activities that may entail additional costs.
- We expect intense competition for IV Tramadol, and new products may emerge that provide different or better therapeutic alternatives for our targeted indications.
- If IV Tramadol does not achieve broad market acceptance, the revenues that we generate from its sales will be limited.

**Risks Pertaining to Intellectual Property and Potential Disputes Thereof**

- If we are unable to obtain and maintain patent protection for our technology and products or if the scope of the patent protection obtained is not sufficiently broad, our competitors could develop and commercialize technology and products similar or identical to ours, and our ability to successfully commercialize our technology and products may be impaired.
  - If we are sued for infringing intellectual property rights of third parties, it will be costly and time consuming, and an unfavorable outcome in any litigation would harm our business.
  - If we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be harmed.
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**PART I**

**Item 1. Business**

**OVERVIEW**

We are a specialty pharmaceutical company that seeks to develop and commercialize our product principally for use in the acute/intensive care hospital setting. Our current product candidate is intravenous (“IV”) Tramadol, for the treatment of post-operative acute pain. Under the terms of certain agreements described herein, we have an exclusive license to develop and commercialize IV Tramadol in the United States. In 2016, we completed a pharmacokinetic study for IV Tramadol in healthy volunteers as well as an end of phase 2 meeting with the U.S. Food and Drug Administration (“FDA”). In the third quarter of 2017, we initiated a Phase 3 development program for IV Tramadol for the management of post-operative pain. In December 2019, we submitted a New Drug Application (“NDA”) for IV Tramadol and received a Complete Response Letter (the “First CRL”) from the FDA in October 2020. In February 2021, we resubmitted the NDA for IV Tramadol. The FDA assigned a Prescription Drug User Fee Act (“PDUFA”) goal date of April 12, 2021 for the resubmitted NDA for IV Tramadol. On June 14, 2021, we announced that we had received a second Complete Response Letter (the “Second CRL”) from the FDA regarding our NDA for IV tramadol. We continued to pursue regulatory approval for IV Tramadol and had a Type A meeting with the FDA in July 2021. We submitted a formal dispute resolution request (“FDRR”) with the Office of Neuroscience of the FDA on July 27, 2021. On August 26, 2021, we received an Appeal Denied Letter from the Office of Neuroscience of the FDA in response to the FDRR submitted on July 27, 2021. On August 31, 2021, we submitted a FDRR with the Office of New Drugs (“OND”) of the FDA. On October 21, 2021, we received a written response from the OND of the FDA stating that the OND needs additional input from an Advisory Committee in order to reach a decision on the FDRR. On February 15, 2022, we had an Advisory Committee meeting with the FDA. In the final part of the public meeting, the Advisory Committee voted yes or no on the following question: “Has the applicant submitted adequate information to support the position that the benefits of their product outweigh the risks for the management of acute pain severe enough to require an opioid analgesic in an inpatient setting?” The results were 8 yes votes and 14 no votes. On March 18, 2022, we received an Appeal Denied Letter from the OND in response to the FDRR. We are evaluating next steps with regard to IV Tramadol. To date, we have not received approval for the sale of our product candidate in any market and, therefore, have not generated any sales revenue from our product candidate.

***Recent Developments***

On November 12, 2018, we, InvaGen Pharmaceuticals Inc. (“InvaGen”), and Madison Pharmaceuticals, Inc. entered into a Stock Purchase and Merger Agreement (“SPMA”), pursuant to which we agreed to our sale in a two-stage transaction. In the first stage, InvaGen agreed to purchase, for \$35 million, common shares representing 33.3% of the fully diluted capitalization of our stock. In the second stage, InvaGen would acquire the remaining issued and outstanding of our capital stock for approximately \$180 million in a reverse subsidiary merger transaction (the “Merger Transaction”). The SPMA was approved by a majority of our stockholders, including a majority of our non-affiliated stockholders, at our special shareholder meeting on February 6, 2019. On February 8, 2019, InvaGen acquired 5,833,333 shares of our common stock at \$6.00 per share (the “Stock Purchase Transaction”) for net proceeds of \$31.5 million after deducting commission fees and other offering costs, representing a 33.3% stake in our capital stock on a fully diluted basis. The SPMA was terminated on November 1, 2021.

In November 2021, through an underwritten public offering, we sold 2,238,805 shares of our common stock at a price of \$1.34 per share resulting in net proceeds of \$2.6 million. In addition, in December 2021, through an underwritten public offering, we sold 1,910,100 shares of our common stock at a price of \$1.07 per share resulting in net proceeds of \$1.8 million.

***Background***

On June 26, 2017, we completed an initial public offering (“IPO”) of our common stock, resulting in net proceeds of approximately \$34.2 million after deducting underwriting discounts, and other offering costs.

We used the proceeds from our IPO to initiate our first Phase 3 trial of IV Tramadol in patients with moderate-to-severe pain following bunionectomy, which had its first patient dosed in September 2017. In May 2018, we announced the study met its primary endpoint and all key secondary endpoints.

In December 2018, we initiated the second Phase 3 trial in patients with moderate-to-severe pain following abdominoplasty upon successful completion of the bunionectomy study. In June 2019, we announced the study met its primary endpoint and all key secondary endpoints.

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In December 2017, we initiated an open-label safety study, which was completed during the second quarter of 2019. The results showed that IV Tramadol is well-tolerated with a side effect profile consistent with known pharmacology.

In December 2019, we submitted an NDA pursuant to Section 505(b)(2) of the Federal Food, Drug and Cosmetic Act. In February 2020, the FDA accepted our NDA submission and set a PDUFA goal date of October 10, 2020. On October 12, 2020, we announced that we had received the First CRL from the FDA regarding our NDA. In November 2020, we had a Type A Meeting with the FDA to discuss issues raised in the First CRL. On February 12, 2021, we resubmitted the NDA to the FDA for IV Tramadol. The NDA resubmission followed the receipt of official minutes from a Type A meeting with the FDA, which was conducted following receipt of the First CRL. The NDA resubmission included revised language relating to the proposed product label and a report relating to terminal sterilization validation. The FDA assigned a PDUFA goal date of April 12, 2021 for the resubmitted NDA for IV Tramadol. On June 14, 2021, we announced that we had received the Second CRL from the FDA regarding our NDA for IV Tramadol. We continue to pursue regulatory approval for IV Tramadol and in connection therewith, had a Type A meeting with the FDA in July 2021. We submitted a FDRR with the Office of Neuroscience of the FDA on July 27, 2021. On August 26, 2021, we received an Appeal Denied Letter from the Office of Neuroscience of the FDA in response to the FDRR submitted on July 27, 2021. On August 31, 2021, we submitted a FDRR with the OND of the FDA. On October 21, 2021, we received a written response from the OND of the FDA stating that the OND needs additional input from an Advisory Committee in order to reach a decision on the FDRR. On February 15, 2022, we had an Advisory Committee meeting with the FDA. In the final part of the public meeting, the Advisory Committee voted yes or no on the following question: "Has the Applicant submitted adequate information to support the position that the benefits of their product outweigh the risks for the management of acute pain severe enough to require an opioid analgesic in an inpatient setting?" The results were 8 yes votes and 14 no votes. On March 18, 2022, we received an Appeal Denied Letter from the OND in response to the FDRR. We are evaluating next steps with regard to IV Tramadol.

On November 12, 2018, we, InvaGen, and Madison Pharmaceuticals, Inc. entered into the SPMA, in which we agreed to our sale in a two-stage transaction. In the first stage, InvaGen agreed to purchase, for \$35 million, common shares representing 33.3% of our fully diluted capital stock. In the second stage, InvaGen would acquire our remaining issued and outstanding capital stock for approximately \$180 million pursuant to the Merger Transaction. The SPMA was approved by a majority of our stockholders, including a majority of our non-affiliated stockholders, at our special shareholder meeting on February 6, 2019. On February 8, 2019, InvaGen acquired 5,833,333 shares of our common stock at \$6.00 per share (the Stock Purchase Transaction) for net proceeds of \$31.5 million after deducting commission fees and other offering costs, representing a 33.3% stake in our capital stock on a fully diluted basis.

Consummation of the Merger Transaction was conditioned upon, among other things, FDA approval of IV Tramadol, its labeling and scheduling, and the absence of certain other restrictions in effect with respect to IV Tramadol. Pursuant to the SPMA, if FDA approval of IV Tramadol was not obtained on or before April 30, 2021, InvaGen would not be subject to the mandatory closing obligations set forth in the SPMA with respect to the Merger Transaction (but would instead retain an option to complete the Merger Transaction up until such time as the SPMA was terminated). Pursuant to the SPMA, we could choose to terminate the SPMA after October 31, 2021, if FDA approval of IV Tramadol had not occurred by such time. On November 1, 2021, we terminated the SPMA.

Even though the SPMA has been terminated, InvaGen retains certain rights pursuant to the Stockholders Agreement, entered into on November 12, 2018 between us, InvaGen and Fortress, and other agreements entered into in connection therewith on such date. These rights exist as long as InvaGen maintains at least 75% of the common shares acquired in the Stock Purchase Transaction and include among other things, the right to restrict us from certain equity issuances and changes to our capital stock without obtaining InvaGen's prior written consent.

Over the past year, we have communicated with InvaGen relating to InvaGen's assertions that Material Adverse Effects (as defined in the SPMA) have occurred due to the impact of the COVID-19 pandemic on potential commercialization and projected sales of IV Tramadol. Additionally, in connection with the resubmission of our NDA in February 2021, InvaGen communicated to us that it believes the proposed label for IV Tramadol would also constitute a Material Adverse Effect (as defined in the SPMA) on the purported basis that the proposed label under certain circumstances would make the product commercially unviable. Even though the SPMA has been terminated, it is still possible for InvaGen to pursue monetary claims against us and/or Fortress based on the foregoing or other potential causes of action.

We may need to obtain additional capital through the sale of debt or equity financings or other arrangements to fund our operations and research and development activity; however, there can be no assurance that we will be able to raise needed capital under acceptable terms, if at all. The sale of additional equity may dilute existing stockholders and newly issued shares may contain senior rights and preferences compared to currently outstanding shares of common stock. Issued debt securities may contain covenants and limit our

ability to pay dividends or make other distributions to stockholders. If we are unable to obtain such additional financing, future operations would need to be scaled back or discontinued.

We are a majority controlled subsidiary of Fortress.

## CORPORATE INFORMATION

Avenue Therapeutics, Inc. was incorporated in Delaware on February 9, 2015. Our executive offices are located at 1140 Avenue of the Americas, Floor 9, New York, NY 10014. Our telephone number is (781) 652-4500, and our email address is [info@avenuetx.com](mailto:info@avenuetx.com).

We maintain a website with the address [www.avenuetx.com](http://www.avenuetx.com). We make available free of charge through our Internet website our annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K, and any amendments to these reports, as soon as reasonably practicable after we electronically file such material with, or furnish such material to, the SEC. We are not including the information on our website as a part of, nor incorporating it by reference into, this report. Additionally, the SEC maintains a website that contains annual, quarterly, and current reports, proxy statements, and other information that issuers (including us) file electronically with the SEC. The SEC's website address is <http://www.sec.gov>.

## OUR STRATEGY

Our primary objective is to establish IV Tramadol as an invaluable part of a treating physician's repertoire of available pharmaceutical options for the management of postoperative pain. The key elements of our strategy include:

- *Obtain FDA approval of IV Tramadol for the management of postoperative acute pain.* In December 2019, we submitted an NDA for IV Tramadol and received the First CRL from the FDA in October 2020. In February 2021, we resubmitted the NDA for IV Tramadol. The FDA assigned a PDUFA goal date of April 12, 2021 for the resubmitted NDA for IV Tramadol. On June 14, 2021, we announced that we had received the Second CRL from the FDA regarding our NDA for IV tramadol. We continue to pursue regulatory approval for IV Tramadol and had a Type A meeting with the FDA in July 2021. We submitted a FDRR with the Office of Neuroscience of the FDA on July 27, 2021. On August 26, 2021, we received an Appeal Denied Letter from the Office of Neuroscience of the FDA in response to the FDRR submitted on July 27, 2021. On August 31, 2021, we submitted a FDRR with OND of the FDA. On October 21, 2021, we received a written response from the OND of the FDA stating that the OND needs additional input from an Advisory Committee in order to reach a decision on the FDRR. On February 15, 2022, we had an Advisory Committee meeting with the FDA. In the final part of the public meeting, the Advisory Committee voted yes or no on the following question: "Has the Applicant submitted adequate information to support the position that the benefits of their product outweigh the risks for the management of acute pain severe enough to require an opioid analgesic in an inpatient setting?" The results were 8 yes votes and 14 no votes.
- *Maintain, expand and protect our intellectual property portfolio.* We intend to expand and protect our intellectual property in the area of IV administration of tramadol in order to maintain a defensible and valuable intellectual property portfolio.

## The U.S. Postoperative Pain Market

We are currently focused on developing our proprietary product candidate, IV Tramadol, for the management of postoperative acute pain. Even though the postoperative pain market is entrenched with low cost, generic pain relievers, we believe that there still remains a significant unmet medical need for safer and better-tolerated painkillers, which are also referred to as analgesics.

According to Decision Resources' Acute Pain Report of October 2014, or the 2014 Pain Report, sales of analgesics delivered via parenteral routes (IV, subcutaneous, and intramuscular injections) for the management of acute pain totaled approximately \$965 million in the United States in 2013. According to the 2014 Pain Report, there were over ten million select common inpatient procedures performed, all of which likely required postoperative pain management, in the United States in 2013. According to IMS Health, injectable analgesics sold approximately \$1 billion in the United States in 2017.

The major goal in the management of postoperative pain is minimizing the dose of medications to lessen side effects while still providing adequate pain relief for analgesia. This is best accomplished with multimodal and preemptive analgesia. An effective pain relief program should be individualized for the particular patient, operation, and circumstances. In clinical practice, as there is no standard set of guidelines to manage postoperative pain, hospitals and even hospital units have their own practice guidelines that are



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often based on physicians' prescribing practices. These local guidelines are rooted in physician experience as it relates to anticipated severity of pain due to a particular surgical procedure, and are often modified with consideration to things like staffing limitations, availability of specific drugs and/or formulations, access to patient controlled analgesia, or PCA, systems, and formulary restrictions. Thus, treatment regimens vary widely from hospital to hospital, physician to physician and patient to patient.

Understanding the range of available interventions and considering the type of surgery is essential to safe and effective pain management. The general consensus among pain management practitioners is that use of more than one modality (i.e., molecules with different mechanisms or with different routes of administration) is optimal for successful postoperative pain management. The most commonly prescribed agents in the immediate postoperative pain market are typically acetaminophen, or APAP, NSAIDS, and opioid analgesics. APAP and NSAIDS are not sufficiently effective as the sole agent for pain management after major surgery in most patients. However, when used in conjunction with opioids, APAP and NSAIDS offer substantial benefits as the quality of analgesia is often improved or enhanced due to their differentiated mechanism of action. Nevertheless, the substantial side effects associated with these agents represent an important concern for patients and physicians to address. NSAIDS in particular have their own serious side effects, including increased post-surgery bleeding, peptic ulcer disease and renal impairment, and is associated with hepatic side effects.

Traditional opioids offer safe and effective postoperative pain control and can be used in combination with other agents and techniques. However, the side effects of opioids, such as morphine, include sedation, dizziness, nausea, vomiting, constipation, physical dependence, tolerance, and respiratory depression. Physical dependence and addiction are clinical concerns that may prevent proper prescribing and, in turn, inadequate pain management. Less common side effects include delayed gastric emptying, hyperalgesia, immunologic and hormonal dysfunction, muscle rigidity, and myoclonus. Importantly, they are Schedule II opioids and carry a high abuse potential.

Therefore, there is still unmet medical need in the post-surgical setting. We believe that IV Tramadol, if approved, can fill this unmet need. If approved, we believe that IV Tramadol will be an effective alternative to traditional opioids but carry a lower potential for abuse because tramadol is a Schedule IV opioid in the U.S.

According to the Drug Enforcement Administration (DEA) definition, substances classified as Schedule II have "a high potential for abuse, with use potentially leading to severe psychological or physical dependence" and substances classified as Schedule IV are "drugs with lower potential for abuse than Schedule II and consist of preparations containing limited quantities of certain narcotics."

The table below summarizes the available intravenous analgesic options in postoperative pain management currently available in the United States.

<u>Available Classes</u>	<u>Pain Levels</u>	<u>Common Limitations &amp; Contraindications</u>
IV narcotics	Moderate to severe	Strong sedation
		Respiratory depression
		Constipation
		Risk of dependence
IV NSAIDS	Mild to severe	Post-op bleeding risk
		GI side effects
		Renal impairment
IV acetaminophen	Mild to moderate	Hepatic impairment

**Our Product Candidate**

Tramadol, a synthetic dual-acting opioid, is a centrally acting analgesic with weak opioid agonist properties. It also works via the inhibition of serotonin and noradrenaline re-uptake and blocking nociceptive impulses at the spinal level. These opioid and non-opioid modes of action are synergistic, essentially providing "multimodal therapy" with the use of a single drug. Tramadol is also commonly combined with APAP or NSAIDS in clinical practice. Tramadol has a well-established efficacy and safety profile and has been used throughout the world for more than 30 years. In the United States, tramadol is approved and marketed as an oral agent indicated in adults for the management of pain severe enough to require an opioid analgesic and for which alternative treatments are inadequate. Tramadol was first approved in the United States in 1995, under the trade name Ultram® immediate release tablet (Ortho-McNeil-Janssen). Ultracet®, a combination product containing tramadol and acetaminophen, is also marketed in the United States (Ortho-McNeil-Janssen). According to Symphony Health Solutions, approximately 30 million scripts for tramadol and tramadol-containing drugs were filled in retail pharmacies in the United States in 2020.

Tramadol has low potential for abuse and addiction and is currently classified by the DEA as a Schedule IV controlled substance. For comparison, other opioids which have a high potential for abuse, including meperidine, morphine, hydromorphone and oxycodone, are all classified as Schedule II controlled substances.

The clinical trials from our development program are summarized below:

- Lu, L., et al. Comparing the Pharmacokinetics of 2 Novel Intravenous Tramadol Dosing Regimens to Oral Tramadol: A Randomized 3-Arm Crossover Study. *Clinical Pharmacology in Drug Development*. October 2019.
- Minkowitz, H., et al. Intravenous Tramadol is Effective in the Management of Postoperative Pain Following Abdominoplasty: A Three-Arm Randomized Placebo- and Active-Controlled Trial. *Drugs in R&D*. May 2020.
- Minkowitz, H., et al. IV Tramadol – A New Treatment Option for Management of Post-Operative Pain in the U.S.: An Open-Label, Single-Arm, Safety Trial Including Various Types of Surgery. *Journal of Pain Research*. May 2020.
- Singla, N., et al. Efficacy and Safety of Intravenously Administered Tramadol in Patients with Moderate to Severe Pain Following Bunionectomy: A Randomized, Double-Blind, Placebo-Controlled, Dose-Finding Study. *Pain and Therapy*. July 2020.

#### **Advantages of IV Tramadol**

Parenteral tramadol is approved and used for the management of postoperative acute pain throughout much of the world. Parenteral formulations include IV, intramuscular, or IM, and subcutaneous, or SC, formulations. Based on our review of IMS Health data from 2014 to 2016, we believe that parenteral tramadol accounts for approximately 10% of the total IV analgesics used in Europe. During the 10-year period from 2010 to 2019, approximately 370 million doses of parenteral tramadol were used in Europe, according to data from IQVIA (a 3<sup>rd</sup> party data provider). There is no parenteral formulation currently approved in the United States.

We believe that the introduction of an IV formulation of tramadol in the United States will address many of the shortcomings of opioids, APAP and NSAIDs currently used in the postoperative setting.

We administered IV Tramadol over approximately 15 minutes in our Phase 3 trials. We believe that our method of administration of IV Tramadol may provide significant benefits such as reduced side effects, compared to previously approved methods of administration of IV Tramadol in Europe, which is typically accomplished via a slow push over 2 to 3 minutes. In addition, our IV Tramadol dosing regimen produces a similar C<sub>max</sub> (maximal blood level) and AUC (overall systemic exposure) to those of oral tramadol at steady state, which we believe ensures an easy transition from IV to oral therapy in the post-surgical setting.

Based on the trials done in Europe and on the data generated with oral tramadol, we believe that IV Tramadol, if approved, will be an attractive option for physicians who treat postoperative pain in the U.S., due to the following attributes:

- As an established analgesic, tramadol has documented efficacy and safety and physicians are already familiar with the drug.
- As a Schedule IV controlled substance, tramadol has less potential for addiction and abuse than other narcotics widely prescribed in the post-surgical setting. In the current environment where the opioid epidemic is a recognized problem in the United States and there are increasing restrictions on Schedule II opioids, a Schedule IV opioid such as tramadol may become a more attractive option.
- Importantly, there is a step-down therapy available for IV Tramadol. Patients are transitioned to oral therapy when they are discharged from the hospital or when they can tolerate oral medicine. Our IV Tramadol dosing regimen provides a similar PK profile to that of oral tramadol at steady state to ensure a smooth step-down process.

We believe that IV Tramadol, if approved, will be a useful and effective tool in the management of acute postoperative pain. Its potential advantages compared to current standard-of-care agents, along with the known efficacy, safety and tolerability profile for oral tramadol support the use of IV Tramadol in this setting. We believe that the risks associated with the use of IV Tramadol will be benign compared to other opioids, and consistent with that of the currently marketed oral tramadol products. Consequently, with the industry trend toward multimodal therapy and away from Schedule II narcotics, we believe that, if approved, IV Tramadol's unique profile could position it to become an invaluable part of a treating physician's repertoire of available pharmaceutical options in the management of postoperative pain.

#### **Clinical Development History**

Revogenex, the previous Sponsor and Licensor, completed multiple nonclinical PK and toxicology studies in dogs, a Phase 1 dose proportionality study and a thorough QT/QTc ("TQT") study of IV Tramadol in healthy volunteers, or the TQT Study. The dose proportionality study was designed to compare maximum exposure and cumulative exposures of IV Tramadol to that of oral tramadol, and to assess the dose proportionality of IV Tramadol in healthy adult volunteers. The TQT Study was done to evaluate whether IV Tramadol has the potential to affect the "corrected QT interval", or QTc, in healthy volunteers. The QTc represents electrical depolarization and repolarization of the heart ventricles. A lengthened QTc is a marker for the potential of ventricular arrhythmias. The results of these studies are consistent with tramadol's known toxicology profile, pharmacokinetics and pharmacology.

#### **PK Study for IV Tramadol**

In general, Phase 2 clinical trials include initial proof-of-concept efficacy studies, dose-finding studies, and initial safety assessments in the target (i.e., to-be-treated) population. We did not conduct Phase 2 clinical trials for IV Tramadol because tramadol is a known analgesic, and oral tramadol is labeled "for the management of pain severe enough to require an opioid analgesic and for which alternative treatments are inadequate" in the United States. Instead, we completed pharmacokinetic ("PK") simulations and conducted a pharmacokinetic and safety study in healthy volunteers, in order to select a Phase 3 dose and dosing regimen designed to achieve exposure to tramadol similar to that provided by oral tramadol. In 2016, we completed a PK study for IV Tramadol in healthy volunteers. A PK study generally involves dosing an experimental medicine in healthy volunteers and taking a series of blood measurements from the study participants to understand how the body handles the drug. A PK study provides information on important parameters such as systemic exposure, maximal and minimal levels of drug concentration in the blood and their time courses. The PK study we conducted was used to select a dose and dosing regimen of IV Tramadol that achieves similar exposure to that provided by oral tramadol at steady state.

The PK study was designed as a three-way cross over study in 18 healthy volunteers. Each subject in the study served as his/her own control and received oral tramadol as well as two different doses of IV Tramadol. Based on the results of the PK study, we decided to use a 50 mg dose in our pivotal Phase 3 program.

#### **Our Clinical Development Strategy for IV Tramadol**

At our EOP2 meeting with FDA, we discussed Phase 3 program requirements for IV Tramadol and confirmed the key elements of the Phase 3 program design. We conducted two pivotal Phase 3 trials to evaluate the safety and efficacy of IV Tramadol, and one additional safety study. All three trials enrolled patients who required IV analgesia following surgery. Over 1,000 patients were enrolled in the Phase 3 program. We believe that the design of our Phase 3 program is consistent with the design of Phase 3 programs for other analgesics being developed.

*Postoperative pain following bunionectomy (orthopedic surgery model).* The first Phase 3 trial was conducted in patients undergoing bunionectomy surgery, which is considered an orthopedic surgical model. 409 patients were randomized and treated in a 1:1:1 ratio to one of two doses of IV Tramadol, or placebo, for 48 hours. The primary efficacy endpoint was Sum of Pain Intensity Difference over 48 hours (SPID 48), which is a measure of the overall effectiveness of the drug in reducing pain intensity during the 48-hour period. This trial commenced in the third quarter of 2017. In May 2018, we announced the trial met its primary endpoint and all key secondary endpoints.

*Postoperative pain following abdominoplasty (soft tissue model).* The second Phase 3 safety and efficacy trial was conducted in patients undergoing abdominoplasty surgery, which is considered a soft-tissue surgical model. 370 patients were randomized and treated in a 3:3:2 ratio to IV Tramadol, placebo or a standard-of-care comparator arm. The primary efficacy endpoint was Sum of Pain Intensity Difference over 24 hours (SPID 24). The trial commenced in December 2018. In June 2019, we announced the trial met its primary endpoint and all key secondary endpoints.

*Open-label safety study.* We initiated the safety study in December 2017 and ran this study concurrently with the two Phase 3 trials. 251 patients were enrolled in the safety study, which had an open label, single arm design. We completed this study in May 2019 and the results showed that IV Tramadol was well-tolerated in multiple surgical models with a side effect profile consistent with known pharmacology.

In December 2019, we submitted an NDA pursuant to Section 505(b)(2) of the Federal Food, Drug and Cosmetic Act. In February 2020, the FDA accepted our NDA submission and set a PDUFA goal date of October 10, 2020. On October 12, 2020, we announced that we had received the First CRL from the FDA regarding our NDA. In November 2020, we had a Type A Meeting with the FDA to discuss issues raised in the First CRL. On February 12, 2021, we resubmitted the NDA to the FDA for IV Tramadol. The NDA resubmission followed the receipt of official minutes from a Type A meeting with the FDA, which was conducted following receipt of the First CRL. The NDA resubmission included revised language relating to the proposed product label and a report relating to terminal sterilization validation. The FDA assigned a PDUFA goal date of April 12, 2021 for the resubmitted NDA for IV Tramadol. On June 14, 2021, we announced that we had received the Second CRL from the FDA regarding our NDA for IV Tramadol. We continue to pursue regulatory approval for IV Tramadol and in connection therewith, had a Type A meeting with the FDA in July 2021. We submitted a FDRR with the Office of Neuroscience of the FDA on July 27, 2021. On August 26, 2021, we received an Appeal Denied Letter from the Office of Neuroscience of the FDA in response to the FDRR submitted on July 27, 2021. On August 31, 2021, we submitted a FDRR with the OND of the FDA. On October 21, 2021, we received a written response from the OND of the FDA stating that the OND needs additional input from an Advisory Committee in order to reach a decision on the FDRR. On February 15, 2022, we had an Advisory Committee meeting with the FDA. In the final part of the public meeting, the Advisory Committee voted yes or no on the following question: "Has the Applicant submitted adequate information to support the position that the benefits of their product outweigh the risks for the management of acute pain severe enough to require an opioid analgesic in an inpatient setting?" The results were 8 yes votes and 14 no votes.

#### **License Agreement with Revogenex Ireland Ltd.**

Effective as of February 17, 2015, Fortress obtained a worldwide (with the exception of Canada, Central America and South America with respect to 50 mg and 100 mg IV Tramadol HCl injections) exclusive license to make, market and sell IV Tramadol pursuant to an agreement with Revogenex, a privately held company in Dublin, Ireland, or the License Agreement. Under the terms of the License Agreement, Fortress paid Revogenex an up-front licensing fee of \$2.0 million upon execution and an additional \$1.0 million on June 17, 2015. A \$1.0 million milestone payment was due upon NDA submission in December 2019 which was incurred by us. There is also an additional milestone totaling \$3.0 million due upon the FDA approval of IV Tramadol. Additional high single-digit to low double-digit royalty payments on net sales of licensed products are due. Royalties will be paid on a product-by-product and country-by-country basis until the expiration in each country of the valid patent claim. In return, Fortress obtained the exclusive worldwide rights to three U.S. patents related to the "Intravenous Administration of Tramadol": U.S. Patent No. 8,895,622 (the '622 patent), which issued on November 25, 2014; U.S. Patent No. 9,561,195 (the '195 patent), which issued on February 7, 2017; and U.S. Patent No. 9,566,253 (the '253 patent), which issued on February 14, 2017 (all with the exception of Canada, Central America and South America with respect to 50 mg and 100 mg IV Tramadol HCl injections). Additionally, Fortress acquired the rights to an open U.S. Investigational New Drug Application pertaining to IV Tramadol, as well as all supporting documentation and relevant correspondence with the FDA. Further, under the License Agreement, Fortress assumed the rights and obligations of Revogenex under its current manufacturing agreement with Zakłady Farmaceutyczne Polpharma (Polpharma), or the Manufacturing Agreement. Fortress transferred all its rights and obligations under the License Agreement and the Manufacturing Agreement to us pursuant to an Asset Transfer Agreement, dated as of May 13, 2015.

The License Agreement will terminate on a product-by-product and country-by-country basis upon the expiration of the last licensed patent right, unless the agreement is earlier terminated. In addition to standard early termination provisions, the License Agreement may also be terminated early by: (i) Revogenex if the FDA does not issue an approval or otherwise issues a "not approvable" notice for the NDA within 27 months after the NDA has been filed with the FDA (December 2019), although this termination right will be tolled if we are using commercial reasonable efforts in our negotiations with the FDA for approval and if we receive a "not approvable" notice (October 2020), we will have a 15 month period to correct any issues and re-submit the NDA for approval, (ii) us if we reasonably determine prior to NDA approval that the development of IV Tramadol is not economically viable, or (iii) either Revogenex or us (provided we are using or have used commercially reasonable efforts to commercialize IV Tramadol) if, after the third anniversary date of the commercial launch, we fail to achieve annual net sales with respect to IV Tramadol of at least \$20 million in any given calendar year, with certain exceptions.

## Competition

The pharmaceutical industry is characterized by rapidly advancing technologies, intense competition and a strong emphasis of proprietary products. We face competition and potential competition from a number of sources, including pharmaceutical and biotechnology companies, generic drug companies, drug delivery companies and academic and research institutions. In addition, companies that are active in different but related fields represent substantial competition for us. Many of our competitors have significantly greater capital resources, larger research and development staffs and facilities and greater experience in drug development, regulation, manufacturing and marketing than we do. These organizations also compete with us to recruit qualified personnel, attract partners for joint ventures or other collaborations, and license technologies that are competitive with ours. To compete successfully in this industry, we must identify novel and unique drugs or methods of treatment and then complete the development of those drugs as treatments before our competitors do so.

We believe that IV Tramadol, if approved, will compete with a number of opioid and non-opioid drugs that are currently available for the management of acute pain or in development. The most commonly used opioids in the postoperative and acute pain settings are morphine, hydromorphone and fentanyl. The non-opioid drugs used in this setting include Ofirmev (IV acetaminophen) and IV formulations of NSAIDs such as Dyloject (diclofenac), Toradol (ketorolac), Anjeso (meloxicam) and Caldolor (ibuprofen). In addition, we also expect to compete with agents such as Exparel (bupivacaine liposome injectable suspension), Zynrelef (bupivacaine and meloxicam) and Xaracoll (bupivacaine implant).

In addition to approved products, there are a number of product candidates in development for the management of acute pain. In addition to reformulations and fixed-dose combination products of already available therapies, there are also several novel agents in clinical development such as NTM-001 (Neumentum, Inc.) and CA-008 (Concentric Analgesics, Inc.).

## Intellectual Property and Patents

### General

Our goal is to obtain, maintain and enforce patent protection for our proprietary technologies, including methods of treatment, to preserve our trade secrets, and to operate without infringing on the proprietary rights of other parties, both in the United States and in other countries. Our policy is to actively seek to obtain, where appropriate, the broadest intellectual property protection possible for our product candidates, proprietary information and proprietary technology through a combination of contractual arrangements and patents in the United States.

Patents and other proprietary rights are crucial to the development of our business. We will be able to protect our proprietary technologies from unauthorized use by third parties only to the extent that our proprietary rights are covered by valid and enforceable patents, are supported by regulatory exclusivity or are effectively maintained as trade secrets. We have several patents and patent applications related to our proprietary technology, but we cannot guarantee the scope of protection of the issued patents, or that such patents will survive a validity or enforceability challenge, or that any of the pending patent applications will issue as patents.

Generally, patent applications in the United States are maintained in secrecy for a period of 18 months or more. The patent positions of biotechnology and pharmaceutical companies are highly uncertain and involve complex legal and factual questions. Therefore, we cannot predict the breadth of claims allowed in biotechnology and pharmaceutical patents, or their enforceability. To date, there has been no consistent policy regarding the breadth of claims allowed in biotechnology patents. Third parties or competitors may challenge or circumvent our patents or patent applications, if issued. If our competitors prepare and file patent applications in the United States that claim technology also claimed by us, we may have to participate in interference proceedings declared by the USPTO to determine priority of invention, which could result in substantial cost, even if the eventual outcome is favorable to us. In the case of inventorship contests relating to patent applications filed on or after March 16, 2013, we may have to participate in derivation proceedings initiated at the Patent Trial and Appeal Board (PTAB), which could also result in substantial cost. Because of the extensive time required for development, testing and regulatory review of a potential product, it is possible that before we commercialize any of our products, any related patent may expire or remain in existence for only a short period following commercialization, thus reducing any advantage of the patent. However, the life of a patent covering a product that has been subject to regulatory approval may have the ability be extended through the patent restoration program, although any such extension could still be minimal.

If a patent is issued to a third party containing one or more preclusive or conflicting claims, and those claims are ultimately determined to be valid and enforceable, we may be required to obtain a license under such patent or to develop or obtain alternative technology, neither of which may be possible. In the event of litigation involving a third-party claim, an adverse outcome in the litigation could subject us to significant liabilities to such third party, require us to seek a license for the disputed rights from such third party, and/or require us to cease use of the technology. Moreover, our breach of an existing license or failure to obtain a license to technology required to commercialize our products may seriously harm our business. We also may need to commence litigation to enforce our patents issued to us or to determine the scope and validity of third party proprietary rights. Litigation would involve substantial costs.

#### **IV Tramadol**

Pursuant to the License Agreement described above, we have exclusive, worldwide commercialization rights to all Revogenex patents, including patent applications, divisionals, continuations, and continuations-in-part, that are directed to IV tramadol (with the exception of Canada, Central America, or South America with respect to 50 mg and 100 mg IV tramadol HCl injections). Currently, this includes U.S. Patent No. 8,895,622 (“the ‘622 patent”), U.S. Patent No. 9,561,195 (“the ‘195 patent”), U.S. Patent 9,566,253 (“the ‘253 patent”), U.S. Patent No. 9,962,343 (“the ‘343 patent”), U.S. Patent No. 10,406,122 (“the ‘122 patent”), U.S. Patent No. 9,693,949 (“the ‘949 patent”), U.S. Patent 9,968,551 (“the ‘551 patent”), U.S. Patent No. 9,980,900 (“the ‘900 patent”), U.S. Patent No. 10,022,321 (“the ‘321 patent”), U.S. Patent No. 10,537,521 (“the ‘521 patent”), U.S. Patent No. 10,624,842 (“the ‘842 patent”), U.S. Patent No. 10,751,279 (“the ‘279 patent”), U.S. Patent No. 10,729,644 (“the ‘644 patent”), U.S. Patent No. 10,022,321 (“the ‘321 patent”), U.S. Patent No. 10,537,521 (“the ‘521 patent”), U.S. Patent No. 10,646,433 (“the ‘433 patent”), U.S. Patent No. 10,617,635 (“the ‘635 patent”), U.S. Patent No. 10,729,645 (“the ‘645 patent”), U.S. Patent No. 10,7512,277 (“the ‘277 patent”) and U.S. Patent No. 10,751,278 (“the ‘278 patent”), and any related patent applications or future patents, including divisionals, continuations, and continuations-in-part.

The ‘622 patent is directed to and claims methods of: treating pain by administering a therapeutically effective dose of tramadol intravenously over a time period from 10 minutes to about 45 minutes (i.e., the rate of IV Tramadol administration); treating pain in humans by intravenously administering tramadol in solution at a range of concentrations over the same time period; treating acute pain in humans by administering IV Tramadol over 10 to 30 minutes, such that at least one side effect is reduced; and treating acute postoperative pain by administering tramadol to a human patient intra-operatively at wound closure, or from first demand of analgesia postoperatively, intravenously over a time period from 10 to 30 minutes, in conjunction with administering further tramadol doses post-operatively and administering a different intravenous opioid analgesic which is not tramadol. Further claims of the ‘622 patent are directed to various effective doses, including 50 mg. These methods of treatment may provide significant benefits (e.g., reduced side effects) over previously approved methods of administration of IV Tramadol, in which the dose was typically accomplished over a two to three-minute period. Additional claims of the ‘622 patent focus on the intravenous administration of tramadol over 15 (±2) minutes, which represents the preferred method of administration that we will be pursuing in obtaining approval of our product through the FDA. The ‘622 patent further describes and claims pharmacokinetic properties of our proprietary method of treatment (e.g., Tmax, Cmax and AUC), which are different from the previously achieved pharmacokinetics of prior IV tramadol formulations, such as Tramal® solution for injection (available outside the U.S.). This patent is scheduled to expire on October 20, 2032, absent possible regulatory patent term extensions.

In view of additional prior art discovered after the issuance of the ‘622 patent, we have focused efforts on obtaining further patent coverage for the technology. Pursuant to the License Agreement, we have exclusive commercialization rights to all continuation patent filings of the ‘622 patent. As a first step, we have prosecuted further claims in multiple continuation patent applications of the ‘622 patent, in which extensive searches were conducted and all information known to be material to patentability was brought to the attention of the USPTO. The goal was to obtain further patent claims which patentably differentiate over the prior art. To date, our efforts have resulted in the issuance of the ‘195 patent, which issued from U.S. Application Serial No. 14/550,279 on February 7, 2017; the ‘253 patent, which issued from U.S. Application Serial No. 14/713,775 on February 14, 2017; the ‘343 patent, which issued from U.S. Application Serial No. 14/550,279 on May 8, 2018; and the ‘122 patent, which issued from U.S. Application Serial No. 15/972,684 on September 10, 2019; all of which are entitled “Intravenous Administration of Tramadol,” and all of which contain the same disclosure (specification) as that of the ‘622 patent. The ‘195, ‘253, ‘343 and ‘122 patents are scheduled to expire on the same day as the expiration of the ‘622 patent (October 20, 2032 absent possible regulatory patent term extensions).

The ‘253 patent includes claims directed to a method of treating moderate to severe acute pain in a human patient by a dose of about 50 mg of IV Tramadol over a time period from 10 minutes to 20 minutes and administering further doses of tramadol at two to six-hour time intervals (each dose being administered intravenously over the same time period).

The ‘343 patent includes claims directed to similar subject matter but varies from the ‘253 patent in that it specifically claims treating acute post-operative pain. There is also a continuation patent application pending with the USPTO.

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The '195 patent includes claims directed to a method of treating moderate to severe acute pain by administering to a human patient a dose of about 50 mg of IV Tramadol over 10 to 20 minutes, and administering further doses of IV Tramadol at two to six hour time intervals to treat pain in said patient, (each dose administered over 10 to 20 minutes), such that the Cmax does not exceed the Cmax of 100 mg oral tramadol administered every six hours for nine doses. The term Cmax refers to the maximum plasma concentration of tramadol achieved during a dosing interval. The claims of the '195 patent therefore further focus on a goal of the technology — that the blood plasma levels of tramadol resulting from our 50 mg intravenous dose to a patient would not be significantly greater than the blood plasma level of the blood plasma levels of tramadol that are already routinely experienced by patients in the United States who are administered oral doses of 100 mg tramadol. Tramadol hydrochloride is approved in the United States for oral administration in an amount from 50 mg to 100 mg administered every four to six hours, not to exceed 400 mg/day.

The '122 patent includes claims directed to a method of treating moderate to severe acute pain or acute post-operative pain by administering to a human patient undergoing an operation a dose of about 50 mg of tramadol at about 2 to about 6 hour time intervals for at least about 48 hours to treat pain in said patient, wherein each dose of tramadol is administered intravenously over a time period from 10 minutes to 20 minutes, such that the patient is treated for acute postoperative pain. Further claims call for at least one dose of tramadol to be administered over 15 (±2) minutes.

The '253, '195, '343 and '122 patents include further claims to the treatment method, including also administering one or more doses of an IV opioid analgesic that is not tramadol as rescue medicine to the patient to treat breakthrough pain. The claims are further directed to the use of the treatment method for postoperative pain, and claims in the '195, '343, and '122 patents are also directed to the treatment method resulting in a reduction in a side-effect associated with tramadol therapy selected from nausea, vomiting, or both.

The '278 and '277 patents are directed to the treatment method, for example, where acute pain is treated.

Other patents are directed to tramadol doses other than about 50 mg. For example, the patents include the '279 patent and the '433 patent (about 60 mg tramadol), and the '521 patent and the '321 patent (about 25 mg tramadol).

The '645, '644, and '635 patents are directed to various aspects of the treatment method wherein tramadol is co-administered with another analgesic: ketorolac (the '645 patent), another analgesic selected from NSAIDs, acetaminophen, and another opioid (the '644 patent), or acetaminophen (the '635 patent).

We believe that the administration of, e.g., a 50 mg IV Tramadol dose over the prolonged time interval is efficacious and also may advantageously lead to a lower incidence of side effects and increased drug tolerability. Additionally, we believe that the claims of these patents patentably differentiate over all prior art that we are aware of and which was made of record with the USPTO.

The License Agreement also grants us the exclusive commercialization rights to the '949 patent and any related patent applications or future patents, including divisionals, continuations, and continuations-in-part. The '949 patent is directed to an IV Tramadol dosing regimen and issued on July 4, 2017. This new patent describes and claims a dosing regimen in which our IV Tramadol product is dosed to a human patient(s) for treating acute pain in a manner such that the plasma levels obtained (including but not limited to Cmax and AUC) are very similar to treatment with a 100 mg oral dose of tramadol hydrochloride to a human patient(s) every six hours at steady state. This is accomplished by intravenously administering a first dose of tramadol 50 mg to a human patient; then intravenously administering a second dose of tramadol 50 mg about 2 hours after the first dose; intravenously administering a third dose of tramadol 50 mg about 2 hours after the second dose; and thereafter intravenously administering doses of tramadol 50 mg at dosage intervals of about 4 hours. It is believed that this dosing regimen may provide advantages over the commercially available oral dosing regimen, and further allows the patient to be stepped down from the IV Tramadol dosing regimen to an oral dosing regimen with less concern about deleterious effects which might occur from a switch from IV to oral analgesic medicine (e.g., as would be the case where the switch to an oral version of the drug provides a much different Cmax and AUC than the IV dose provides at steady state). This new dosing regimen is the result of considerable experimentation by us, and a prior art search has not revealed any similar dosing regimen being used or published with respect to IV Tramadol infusions. The patent term of the '949 patent is scheduled to expire on May 24, 2036, absent possible regulatory patent term extensions.

A continuation of the '949 patent issued as the '551 patent on May 18, 2018, claiming the same dosing regimen except that it includes claims that specify that the mean Cmax after the third administered dose of tramadol is similar to the mean Cmax at steady-state for a dosing regimen of 100 mg tramadol HCl administered orally every 6 hours, and/or specifies pharmacokinetic parameters for Cmax and/or AUC at steady-state. The '551 patent is scheduled to expire on the same day as the '949 patent (May 24, 2036, absent possible regulatory patent term extensions).

The '900 patent (a continuation-in-part of the '949 patent) issued on May 29, 2018 and is directed to the same dosing regimen, except that it includes claims that specify the pharmacokinetic parameters after the third administered dose of tramadol. Further continuation patent applications are pending for (i) the 50 mg dosing regimen to human patients experiencing acute pain or acute post-operative pain; (ii) the 50 mg dosing regimen directed to administering a first dose of tramadol 50 mg to a human patient and thereafter intravenously administering additional doses of tramadol to the human patient(s) in an amount of about 50 mg tramadol at dosage intervals of about 4 hours, except that a second dose is intravenously administered as a loading dose at a shortened interval as compared to the dosage interval of about 4 hours, and (iii) administering the 50 mg dosing regimen as described with an NSAID as well. The '900 patent is scheduled to expire on the same day as the '949 patent (May 24, 2036, absent possible regulatory patent term extensions).

The License Agreement also grants us the exclusive commercialization rights to continuation applications of the '949, '551, and '900 patents (and related applications) that are currently pending at the USPTO. This includes, but is not limited to, U.S. Application Serial No. 15/976,503 ("the '503 application"), a continuation of the '551 patent and filed on May 10, 2018; U.S. Application Serial No. 16/223,522 ("the '522 application"), a continuation of the '199 application and filed on December 18, 2018; U.S. Application Serial No. 15/986,199 ("the '199 application"), a continuation of the '900 patent and filed on May 22, 2018; and U.S. Application Serial No. 16/223,556 ("the '556 application"), a continuation of the '503 application and filed on December 18, 2018. The '503, '522, and '199 applications are directed to various dosing regimens for intravenous administration of a 50 mg dose of tramadol. The '556 application is directed to various dosing regimens for intravenous administration of a 60 mg dose of tramadol.

The License Agreement further grants us exclusive commercialization rights to new patents/patent applications pending with the USPTO directed to the intravenous administration of tramadol co-administered with other analgesics. Currently, these patent applications include U.S. Application Serial No. 16/269,213 ("the '213 application", now the '279 patent), a continuation of the '556 application and filed February 6, 2019; U.S. Application Serial No. 16/269,124 ("the '124 application", now U.S. Patent No. 10,729,644), a continuation of the '522 application and filed on February 6, 2019; U.S. Application Serial No. 16/375,363 ("the '363 application", now the '635 patent), a continuation of the '213 application and filed on April 4, 2019 (now U.S. Patent No. 10,751,279); and U.S. Application Serial No. 16/376,382 ("the '382 application", now the '645 patent), a continuation of the '213 application and filed on April 5, 2019. The '213 application is directed to intravenously administering a first dose of 60 mg of tramadol, later administering doses every 6 hours (except for the second dose, which is a loading dose administered in a shorter time period), and also administering another analgesic. The '124 application (now the '644 patent) is similar, but it claims a dosage of 50 mg. The '363 application is also similar to the '213 application, in that it claims 60 mg, but it varies in that it specifies acetaminophen as the other analgesic. The '382 application is similar to the '124 application, in that it claims 50 mg, but it varies in that it specifies ketorolac as the other analgesic.

The License Agreement also grants us the exclusive commercialization rights to the '321 patent, which is directed to an IV Tramadol dosing regimen and issued on July 17, 2018. This new patent describes and claims a dosing regimen in which our IV Tramadol product is dosed to a human patient(s) for treating acute pain by intravenously administering a first dose of tramadol 25 mg to a human patient; then intravenously administering a second dose of tramadol 25 mg about 2 hours after the first dose; intravenously administering a third dose of tramadol 25 mg about 2 hours after the second dose; and thereafter intravenously administering doses of tramadol 25 mg at dosage intervals of about 4 hours. The '321 patent is scheduled to expire on April 13, 2037, absent possible regulatory patent term extensions.

A continuation of the '321 patent issued as the '521 patent on January 21, 2020, claiming the same dosage as the '321 patent (25 mg), but over dosing intervals of about 4 hours, where the second dose is intravenously administered as a loading dose at a shortened interval as compared to the interval of about 4 hours. It further claims this method of treatment, where the at least one side effect, selected from nausea, vomiting, and seizure, is reduced. The '521 patent is scheduled to expire on the same day as the '321 patent (April 13, 2037, absent possible regulatory patent term extensions).

With the exception of 50 mg and 100 mg dosages of IV tramadol HCl in Canada, Central America, and South America, the License Agreement also grants us the exclusive commercialization rights to certain foreign patents and patent applications, including PCT applications. With the exception of the territory constraint listed above, we have the exclusive commercialization rights to PCT Application No. US/2012/033304 and any related patents or patent applications.

In sum, we believe that our patent filings will prevent third parties from marketing a generic version of our product without infringing claims of the patent(s) we are seeking. Further, we have conducted clearance searches of U.S. issued and foreign patents, and have not identified any bars to the commercialization of our tramadol technology.



## **Other Intellectual Property Rights**

We depend upon trademarks, trade secrets, and continuing technological advances to develop and maintain our competitive position. We also depend upon the skills, knowledge and experience of our scientific and technical personnel, as well as that of our advisors, consultants and other contractors. This knowledge and experience we call “know-how.” To help protect our proprietary know-how which is not patentable, and for inventions for which patents may be difficult to enforce, we rely on trade secret protection and confidentiality agreements to protect our interests. To this end, we require all employees, scientific advisors, consultants, collaborators and other contractors, upon commencement of a relationship with us, to enter into confidentiality agreements, which prohibit the disclosure of confidential information and, in the case of parties other than our research and development collaborators, require disclosure and assignment to us of the ideas, developments, discoveries and inventions important to our business. These agreements are designed to protect our proprietary information and to grant us ownership of technologies that are developed in connection with their relationship with us. These agreements may not, however, provide protection for our trade secrets in the event of unauthorized disclosure of such information.

## **Supply and Manufacturing**

The chemical name for tramadol hydrochloride is cis-2-[(dimethyl amino) methyl]-1-(3-methoxyphenyl) cyclohexanol hydrochloride. Unless otherwise specified, the term tramadol refers to the racemic mixture of the (±) cis isomers. IV Tramadol (Tramadol Hydrochloride Injection) is a sterile solution formulation of tramadol HCl 50 mg/1 mL, for IV administration. Each unit of IV Tramadol consists of glass ampoules of 50 mg of tramadol HCl and sodium acetate as buffering agent in 1 mL of water for injection. The final drug product is stable at room temperature.

We do not own or operate manufacturing facilities for the production of IV Tramadol, nor do we have plans to develop or own manufacturing operations in the foreseeable future. Currently, we have one manufacturer, Polpharma, who subcontracts several activities to another manufacturer, to provide us clinical and commercial supply of IV Tramadol in accordance with current Good Manufacturing Practice (CGMP) requirements. We also may plan to qualify a backup manufacturer. We will be obligated to purchase a minimum amount of final packaged drug product from our current manufacturer over the course of five years commencing upon the approval of our NDA for IV Tramadol. We will pay a fixed per dose unit fee to our current manufacturer in addition to a low single digit royalty on net sales revenue and a milestone payment amount of \$2.0 million upon FDA approval of IV Tramadol.

We and our manufacturer, as well as its key subcontractor, are and will be subject to extensive government regulation in connection with the manufacture of any pharmaceutical product, including ongoing periodic and unannounced inspections by the FDA, the DEA and corresponding state, European and other foreign agencies to ensure strict compliance with CGMPs and other applicable state, federal and foreign regulations. We do not have control over third party manufacturers’ compliance with these regulations and standards, other than through contractual obligations and audit oversight. If they are deemed out of compliance with CGMPs, product recalls could result, inventory could be destroyed, production could be stopped and supplies could be delayed or otherwise disrupted.

If we need to change manufacturers after commercialization, the FDA and some corresponding foreign regulatory agencies must approve these new manufacturers in advance, which will involve testing and additional inspections to ensure compliance with CGMPs and other FDA regulations and standards and may require significant lead times and delay. Furthermore, switching manufacturers may be difficult because the number of potential manufacturers is limited. It may be difficult or impossible for us to find a replacement manufacturer quickly or on terms acceptable to us, or at all.

## **Government and Industry Regulations**

### **General**

#### **U.S. Drug Development**

In the United States, the FDA regulates drugs under the FDCA, and its implementing regulations. Since our drug product candidate is an opioid, such drugs are also regulated by the DEA as controlled substances under the Controlled Substances Act, even at the drug development stage. Drugs are also subject to other federal, state and local statutes and regulations. The process of obtaining regulatory approval and maintaining subsequent compliance with applicable federal, state and local statutes and regulations require the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during product development, the approval process or after approval may subject an applicant to administrative or judicial sanctions. These sanctions could include, among other actions, the FDA’s refusal to approve pending applications, withdrawal of an approval, a clinical hold,

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untitled or warning letters, voluntary product recalls or market withdrawals, product seizures, total or partial suspension of production or distribution injunctions, fines, consent decrees, refusals of government contracts, restitution, disgorgement or civil and criminal penalties. Any regulatory, compliance or enforcement action by any agency or judicial enforcement action could have a material adverse effect on our products, or our Company. If we fail to manufacture our product candidate in sufficient quantities and at acceptable quality and pricing levels, fail to comply with additional DEA requirements related to controlled substances, or fail to fully comply with CGMP regulations, we may face delays in the commercialization of this product candidate or be unable to meet market demand, and may be unable to generate potential revenues.

Our product candidate must be approved by the FDA through one of FDA's available drug approval processes before they may be legally marketed in the United States – (1) an NDA submitted under section 505(b)(1) of the FDCA; (2) an abbreviated new drug application (“ANDA”) under section 505(j); or (3) a new drug application submitted under section 505(b)(2) of the FDCA (505(b)(2) application). We have already submitted our first 505(b)(2) application and intend to utilize the 505(b)(2) regulatory approval pathway for any additional product candidates. Development and approval of drugs generally involves the following:

- Submission to the FDA of an IND, which must become effective before clinical trials involving humans may begin;
- Approval by an independent institutional review board, or IRB, or ethics committee at each clinical trial site before a trial may be initiated at that site;
- Performance of adequate and well-controlled human clinical trials in accordance with applicable IND regulations and other good clinical practices, or GCPs;
- Submission of an application (NDA, ANDA or 505(b)(2)) to the FDA;
- The FDA's decision within 60 days of its receipt of an NDA to accept it for filing and review;
- Satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities where the drug is produced to assess compliance with CGMPs and assure that the facilities, methods and controls are adequate to preserve the drug's identity, strength, quality and purity;
- Possible FDA audit of the clinical trial sites that generated the data in support of the NDA; and
- FDA review and approval of the NDA.

The nonclinical testing, clinical trials and review process requires substantial time, effort and financial resources, and we cannot be certain that any approvals for our product candidates will be granted on a timely basis, if at all. The data required to support an NDA are generated in two distinct developmental stages: nonclinical and clinical. The nonclinical development stage generally involves synthesizing the active component, developing the formulation and control procedures and determining the manufacturing process, as well as carrying out non-human toxicology, pharmacology and drug metabolism studies in the laboratory, which may support subsequent clinical testing in humans. In the case of documentation to support a 505(b)(2) NDA, this nonclinical data may be referenced in literature or the FDA's previous findings of safety and efficacy for a listed drug. The sponsor must submit the results of the nonclinical studies, together with manufacturing information, analytical data, any available clinical data or literature and a proposed clinical protocol, to the FDA as part of the IND. An IND is a request for authorization from the FDA to administer an investigational drug product to humans, and must become effective before clinical trials may begin. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions related to one or more proposed clinical trials and places the IND on clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, submission of an IND may not result in the FDA allowing clinical trials to commence.

The clinical stage of development involves the administration of the product candidate to healthy volunteers and patients under the supervision of qualified investigators, generally physicians not employed by or under the sponsor's control, in accordance with GCPs, which include the requirement that all research subjects provide their informed consent for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the objectives of the trial, dosing procedures, subject selection and exclusion criteria and the parameters to be used to monitor subject safety and assess efficacy. Each protocol, and any subsequent amendments to the protocol, must be submitted to the FDA as part of the IND. Further, each clinical trial must be reviewed and approved by an independent IRB for each institution where the trial will be conducted to ensure that the risks to individuals participating in the clinical trials are minimized and are reasonable in relation to anticipated benefits. The IRB also approves the informed consent form that must be provided to each subject or his or her legal representative and must monitor the clinical trial until completed.

## Clinical Trials

Clinical trials are generally conducted in three sequential phases, known as Phase 1, Phase 2 and Phase 3, and may overlap.

- Phase 1 clinical trials generally involve a small number of healthy volunteers who are initially exposed to a single dose and then multiple doses of the product candidate. The primary purpose of these clinical trials is to assess the metabolism, pharmacology, side effect tolerability and safety of the drug.
- Phase 2 clinical trials typically involve studies in disease-affected patients to determine the dose required to produce the desired benefits. At the same time, safety and further pharmacokinetic and pharmacodynamics information is collected, possible adverse effects and safety risks are identified and a preliminary evaluation of efficacy is conducted.
- Phase 3 clinical trials generally involve large numbers of patients at multiple sites and are designed to provide the data necessary to demonstrate the product candidate's safety and effectiveness for its intended use, establish its overall benefit/risk relationship, and provide an adequate basis for approval.

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

Before approval, progress reports detailing the results of the clinical trials, 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 same or similar drugs, findings from animal or *in vitro* testing suggesting a significant risk to humans, and any clinically important rate increase of a serious suspected adverse reaction compared to that listed in the protocol or investigator brochure. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, if at all. The FDA or the sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the trial is not being conducted in accordance with the IRB's requirements or the use of the drug raises any safety concerns. Additionally, some clinical trials are overseen by an independent group of qualified experts organized by the sponsor, known as a data safety monitoring board or committee. Depending on its charter, this group may determine whether a trial may move forward at designated check points based on access to certain data from the trial.

There are also requirements governing the reporting of ongoing clinical trials and completed trial results to public registries. Sponsors of certain clinical trials of FDA-regulated products are required to register and disclose specified clinical trial information, which is publicly available at [www.clinicaltrials.gov](http://www.clinicaltrials.gov). Information related to the product, patient population, phase of investigation, study sites and investigators and other aspects of the clinical trial is then made public as part of the registration. Sponsors are also obligated to discuss the results of their clinical trials after completion. Disclosure of the results of these trials can be delayed until the new product or new indication being studied has been approved. However, there are evolving rules and increasing requirements for publication of all trial-related information, and it is possible that data and other information from trials involving drugs that never garner approval could require disclosure in the future.

Concurrent with clinical trials, companies usually develop additional information about the chemistry and physical characteristics of the drug as well as finalize a process for manufacturing it in commercial quantities in accordance with CGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product candidate, and, among other things, a drug manufacturer must develop methods for testing the identity, strength, quality and purity of the final drug product. 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.

## NDA and FDA Review Process

The results of nonclinical studies and clinical trials, together with other detailed information, including extensive information on manufacturing and drug composition and proposed labeling, are submitted to the FDA in the form of an NDA requesting approval to market the drug for one or more specified indications. The FDA reviews an NDA to determine, among other things, whether a drug is safe and effective for its intended use and whether the product is being manufactured in accordance with CGMPs to assure and preserve the product's identity, strength, quality and purity. FDA approval of an NDA must be obtained before a drug may be legally marketed in the United States.

Under the PDUFA as amended in 2017, each NDA must be accompanied by a user fee. The FDA adjusts the PDUFA user fees on an annual basis. According to the FDA's current fee schedule for fiscal year (FY) 2022, effective through September 30, 2022, the user fee for an application requiring clinical data, such as an NDA, is \$3,117,218. Clinical data, as interpreted by the FDA to assess fees under PDUFA, include (1) study reports or literature reports of what are explicitly or implicitly represented by the applicant to be adequate and well-controlled trials for safety or effectiveness or (2) reports of comparative activity (other than bioequivalence and bioavailability studies), immunogenicity, or efficacy, where those reports are necessary to support a claim of comparable clinical effect. The term does not include bioequivalence and bioavailability studies submitted in support of an NDA. NDAs for which clinical data are not required to demonstrate safety and effectiveness are reduced to half of the amount of the prescribed user fee, or \$1,558,609 for FY 2022. PDUFA also imposes an annual Prescription Drug Program Fee (\$369,413 per approved product for FY 2022) for establishments named as the applicant in a human drug application. An establishment is not to be assessed more than five (5) prescription drug program fees in a given fiscal year. Fee waivers or reductions are available in certain circumstances, including waiver of the application fee for the first application filed by a small business.

The FDA performs an administrative review of an NDA before accepting it for filing and may request additional information rather than accepting the applications. The FDA must make a decision on accepting an NDA for filing within 60 days of receipt. Once the submission is accepted for filing, the FDA begins an in-depth scientific and technical review of the NDA. Under the goals and policies agreed to by the FDA under PDUFA, the FDA has ten months from the filing date in which to complete its initial review of a standard NDA and respond to the applicant, and six months from the filing date for an NDA designated for priority review. The FDA does not always meet its PDUFA goal dates for standard and priority NDAs, and the review process is often significantly extended by FDA requests for additional information or clarification.

Before approving an NDA, the FDA will conduct a pre-approval inspection of the manufacturing facilities for the new product to determine whether they comply with CGMPs. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with CGMP requirements and adequate to assure consistent production of the product to specifications. The FDA may also audit data from clinical trials to ensure compliance with GCP requirements. Additionally, the FDA may refer applications for novel drug products or drug products which present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation regarding whether the application should be approved and, if so, under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers them carefully when making decisions. NDAs submitted under Section 505(b)(2) are typically not referred to an Advisory Panel for consideration unless new safety information is revealed in the review cycle. The FDA likely will re-analyze the clinical trial data, which could result in extensive discussions between the FDA and the applicant during the review process. The review and evaluation of an NDA by the FDA is extensive and time consuming and may take longer than originally planned to complete, and we may not receive a timely approval, if at all.

After the FDA evaluates an NDA, it will issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the drug with prescribing information for specific indications. A Complete Response Letter indicates that the review cycle of the application is complete and the application will not be approved in its present form. A Complete Response Letter usually describes the specific deficiencies in the NDA identified by the FDA, and may require additional clinical data, such as an additional pivotal Phase 3 clinical trial, and other significant and time-consuming requirements related to clinical trials, nonclinical studies or manufacturing. If a Complete Response Letter is issued, the applicant may resubmit the NDA, addressing all of the deficiencies identified in the letter, or withdraw the application. Even if such data and information are submitted, the FDA may decide that the NDA does not satisfy the criteria for approval. Data obtained from clinical trials are not always conclusive, and the FDA may interpret data differently than the sponsor interprets the same data.

There is no assurance that the FDA will approve a product candidate for marketing, and the sponsor may encounter significant difficulties or costs during the review process. If a product receives marketing approval, the approval may be significantly limited to specific diseases and dosages or the indications for use may otherwise be limited, which could restrict the commercial value of the product. Further, the FDA may require that certain contraindications, warnings or precautions be included in the product labeling, or it may condition approval on changes to the proposed labeling. The FDA also may condition approval on the development of adequate controls and specifications for manufacturing and a commitment to conduct post-marketing testing and surveillance to monitor the potential effects of approved products. For example, the FDA may require Phase 4 trials designed to further assess a drug's safety and efficacy.

The FDA may also place other conditions on approval including the requirement for a risk evaluation and mitigation strategy, or REMS, to assure the safe use of the drug. If the FDA concludes a REMS is needed, the sponsor of the NDA must submit a proposed REMS. The FDA will not approve the NDA without an approved REMS, if required. A REMS 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. Any of these limitations on approval or marketing could restrict the commercial promotion, distribution, prescription or dispensing of products. Marketing approval may be withdrawn for non-compliance with regulatory requirements or if problems occur following initial marketing.

#### **Section 505(b)(2) Regulatory Approval Pathway**

Section 505(b)(2) was added to the Act by the Drug Price Competition and Patent Term Restoration Act of 1984 (Hatch-Waxman Amendments). Section 505(b)(2) of the FDCA provides an alternate regulatory pathway for approval of a new drug by allowing the FDA to rely on data not developed by the applicant. Specifically, Section 505(b)(2) permits the submission of an NDA where one or more of the investigations relied upon by the applicant for approval was not conducted by or for the applicant and for which the applicant has not obtained a right of reference. The applicant may rely upon published literature and/or the FDA's findings of safety and effectiveness for an approved drug already on the market. Approval or submission of a 505(b)(2) application, like those for abbreviated new drugs, or ANDAs, may be delayed because of patent and/or exclusivity rights that apply to the previously approved drug.

Under the 505(b)(2) regulatory approval pathway, the applicant may reduce some of the burdens of developing a full clinical program by relying on investigations not conducted by the applicant and for which the applicant has not obtained a right of reference, such as prior investigations involving the listed drug. In such cases, some clinical trials may not be required or may be otherwise limited.

A 505(b)(2) application may be submitted for a new chemical entity (NCE), when some part of the data necessary for approval is derived from studies not conducted by or for the applicant and when the applicant has not obtained a right of reference. Such data are typically derived from published studies, rather than FDA's previous findings of safety and effectiveness of a previously approved drug. For changes to a previously approved drug however, an applicant may rely on the FDA's finding of safety and effectiveness of the approved drug, coupled with information needed to support the change from the approved drug, such as new studies conducted by the applicant or published data. When based on an approved drug, the 505(b)(2) drug may be approved for all of the indications permitted for the approved drug, as well as any other indication supported by additional data.

Section 505(b)(2) applications also may be entitled to marketing exclusivity if supported by appropriate data and information. As discussed in more detail below, three-year new data exclusivity may be granted to the 505(b)(2) application if one or more clinical investigations conducted in support of the application, other than bioavailability/bioequivalence studies, were essential to the approval and conducted or sponsored by the applicant. Five years of marketing exclusivity may be granted if the application is for an NCE, and pediatric exclusivity is likewise available.

#### **Orange Book Listing and Paragraph IV Certification**

For NDA submissions, including 505(b)(2) applications, applicants are required to list with the FDA certain patents with claims that cover the applicant's product. Upon approval, each of the patents listed in the application is published in *Approved Drug Products with Therapeutic Equivalence Evaluations*, commonly referred to as the Orange Book. Any applicant who subsequently files an ANDA or a 505(b)(2) application that references a drug listed in the Orange Book must certify to the FDA that (1) no patent information on the drug product that is the subject of the application has been submitted to the FDA; (2) such patent has expired; (3) the date on which such patent expires; or (4) such patent is invalid or will not be infringed upon by the manufacture, use or sale of the drug product for which the application is submitted. This last certification is known as a Paragraph IV certification.

If an applicant has provided a Paragraph IV certification to the FDA, the applicant must also send notice of the Paragraph IV certification to the holder of the NDA for the approved drug and the patent owner once the application has been accepted for filing by the FDA. The NDA holder or patent owner may then initiate a patent infringement lawsuit in response to notice of the Paragraph IV certification. The filing of a patent infringement lawsuit within 45 days of the receipt of a Paragraph IV certification prevents the FDA from approving the ANDA or 505(b)(2) application until the earlier of 30 months from the date of the lawsuit, the applicant's successful defense of the suit, or expiration of the patent.

#### **Pediatric Information**

Under the Pediatric Research Equity Act, or PREA, an NDA or supplement to an NDA must contain data to assess the safety and efficacy of the drug for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation in which the product is safe and effective. The FDA may grant deferrals for submission of pediatric data or full or partial waivers.

The Food and Drug Administration Safety and Innovation Act, or FDASIA, which was signed into law on July 9, 2012, amended the FDCA to require that a sponsor who is planning to submit an NDA for a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration submit an initial Pediatric Study Plan, or PSP, within 60 days of an end-of-Phase 2 meeting or, if there is no such meeting, as early as practicable before the initiation of the Phase 3 or Phase 2/3 trial. The initial PSP must include an outline of the pediatric trial(s) that the sponsor plans to conduct, including objectives and design, age groups, relevant endpoints and statistical approach, or a justification for not including such information and any request for a deferral of pediatric assessments or a full or partial waiver of the requirement to provide data from pediatric trials. The FDA and the sponsor must reach an agreement on the PSP, but the sponsor can submit amendments to an agreed-upon initial PSP at any time if changes to the pediatric plan need to be considered based on data collected from nonclinical studies, early phase clinical trials and other clinical development programs.

#### **Post-Marketing Requirements**

Following approval, the company and the new product are subject to continuing regulation by the FDA, which include monitoring and recordkeeping activities, reporting of adverse experiences and complying with promotion and advertising requirements, which include prohibitions on the promotion of the drugs for unapproved, or “off-label” uses. Although physicians may prescribe legally available drugs for off-label treatments, manufacturers may not promote such non-FDA approved uses. Prescription drug promotional materials must be submitted to the FDA in conjunction with their first use on an on-going basis. Further, if there are any modifications to the drug, including changes to indications, labeling, or manufacturing processes or facilities, the applicant may be required to submit and obtain FDA approval of a supplemental NDA or new NDA, which may require the applicant to develop additional data or conduct additional nonclinical studies or clinical trials.

The FDA regulations require that products be manufactured in specific approved facilities and in accordance with CGMPs. These regulations require, among other things, quality control and quality assurance, the maintenance of records and documentation and the obligation to investigate and correct any deviations from CGMPs. Drug manufacturers and other entities involved in the manufacture and distribution of approved drugs are required to register their establishments with the FDA and certain state agencies, and are subject to periodic, unannounced inspections by the FDA and certain state agencies for compliance with CGMPs and other laws. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain compliance with CGMPs. The discovery of violative conditions, including failure to conform to CGMPs, could result in enforcement actions, and the discovery of problems with a product after approval may result in restrictions on a product, manufacturer or holder of an approved NDA, including voluntary recalls and product seizures.

Discovery of previously unknown problems with a product or the failure to comply with applicable FDA requirements can have negative consequences, including adverse publicity, judicial or administrative enforcement, untitled or warning letters from the FDA, mandated corrections to advertising or communications to doctors and civil or criminal penalties, among others. Newly discovered or developed safety or effectiveness data may require changes to a product’s approved labeling, including the addition of new warnings and contraindications, and also may require the implementation of other risk management measures. New government requirements, including those resulting from new legislation, may be established, or the FDA’s policies may change, which could delay or prevent regulatory approval of our products under development.

#### **U.S. Marketing Exclusivity**

The FDCA provides three years of marketing exclusivity for an NDA, or supplement to an existing NDA, for a drug product that contains a previously approved NCE if new clinical investigations, other than bioavailability/bioequivalence studies, were essential to the application’s approval (*e.g.*, for new indications, dosages or strengths of an existing drug). This three-year exclusivity for new data covers only the modification for which the drug received approval on the basis of the new clinical investigations and does not prohibit the FDA from approving ANDAs for drugs containing the active agent for the original indication. Furthermore, this exclusivity will not delay the submission or approval of a full NDA. However, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to all of the nonclinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and efficacy.

Pediatric exclusivity is another type of regulatory market exclusivity in the United States, which, if granted, adds six months to existing exclusivity periods and patent terms. This six-month exclusivity, which runs from the end of other exclusivity protections or patent term, may be granted based on the voluntary completion of a pediatric trial in accordance with an FDA-issued “Written Request.” The FDA issues a written request for pediatric clinical trials before approval of an NDA only where it determines that information relating to the use of a drug in a pediatric population, or part of the pediatric population, may produce health benefits in that population.

## **DEA Regulation**

Because our product candidate is subject to the Controlled Substances Act (CSA) we must comply with various statutory requirements set forth by the CSA, as amended, and its implementing regulations as enforced by the DEA. The CSA imposes various registration, record-keeping and reporting requirements, procurement and manufacturing quotas, labeling and packaging requirements, security controls, prescription and order form requirements and restrictions on prescription refills for certain kinds of pharmaceutical products. A principal factor for determining the particular requirements of the CSA applicable to a product, if any, is its actual or potential abuse profile, which is classified into a DEA schedule. A product may be listed as a Schedule I, II, III, IV or V controlled substance, with Schedule I presenting the highest perceived risk of abuse and Schedule V presenting the least. For example, Schedule I controlled substances have no currently accepted medical use in treatment in the United States and a lack of accepted safety for use under medical supervision. The active ingredient in our product candidate is classified as a Schedule IV controlled substance.

Annual registration is required for any facility that manufactures, distributes, dispenses, imports or exports any controlled substance. The registration is specific to the particular location, activity and controlled substance schedule. For example, separate registrations are needed for import and manufacturing, and each registration will specify which schedules of controlled substances are authorized. Similarly, separate registrations are also required for separate facilities.

The DEA typically inspects a facility to review its security measures prior to issuing a registration and on a periodic basis. Security requirements vary by controlled substance schedule, with the most stringent requirements applying to Schedule I and Schedule II controlled substances and less stringent requirements for Schedules III, IV, and V. Required security measures include background checks on employees and physical control of inventory through measures such as vaults and inventory reconciliations. Records must be maintained for the handling of all controlled substances, and periodic reports made to the DEA. Reports must also be made for thefts or losses of any controlled substance, and to obtain authorization to destroy any controlled substance.

In addition, a DEA quota system controls and limits the availability and production of controlled substances in Schedule I or II. Distributions of any Schedule I or II controlled substance must also be accompanied by special order forms, with copies provided to the DEA. Because the active ingredient in our product candidate is currently regulated as a Schedule IV controlled substances, it will not be subject to the DEA's production and procurement quota scheme.

To enforce these requirements, the DEA conducts periodic inspections of registered establishments that handle controlled substances. Failure to maintain compliance with applicable requirements, particularly as manifested in loss or diversion, can result in administrative, civil or criminal enforcement action. The DEA may seek civil penalties, refuse to renew necessary registrations or initiate administrative proceedings to revoke those registrations. In some circumstances, violations could result in criminal proceedings.

In addition to federal scheduling, some drugs may be subject to state-controlled substance regulation and thus more extensive requirements than those determined by the DEA and FDA.

## **Other Healthcare Laws and Compliance Requirements**

Manufacturing, sales, promotion and other activities following product approval are also subject to regulation by numerous regulatory authorities in addition to the FDA, including the Centers for Medicare & Medicaid Services, other divisions of the Department of Health and Human Services, the U.S. Department of Justice, the DEA, the Consumer Product Safety Commission, the Federal Trade Commission, the Occupational Safety & Health Administration, the Environmental Protection Agency and state and local governments.

We will also be subject to various federal and state laws targeting fraud and abuse in the healthcare industry. These laws may impact, among other things, our proposed sales, marketing and educational programs. In addition, we may be subject to patient privacy regulation by both the federal government and the states in which we conduct our business. The laws that may affect our ability to operate include:

- The federal Anti-Kickback Statute, which prohibits, among other things, persons from knowingly and willfully soliciting, receiving, offering or paying remuneration, directly or indirectly, in cash or in kind, to induce or reward, or in return for, either (1) the referral of an individual to a person for furnishing any item or service for which payment is available under a federal health care program, or (2) the purchase, lease, order or recommendation thereof of any good, facility, service or item for which payment is available under a federal health care program;

- The False Claims Act and civil monetary penalty laws, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, false or fraudulent claims for payment from the federal government or making or using, or causing to be made or used, a false record or statement material to a false or fraudulent claim;
- The federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created new federal criminal statutes that prohibit executing a scheme to defraud any healthcare benefit program, obtaining money or property of the health care benefit program through false representations or knowingly and willingly falsifying, concealing or covering up a material fact, making false statements or using or making any false or fraudulent document in connection with the delivery of, or payment for, health care benefits or services;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, or HITECH, and its implementing regulations, which imposes certain requirements relating to the privacy, security and transmission of individually identifiable health information;
- The provision under the ACA commonly referred to as the Sunshine Act, which requires applicable manufacturers of covered drugs, devices, biologics and medical supplies to track and annually report to CMS payments and other transfers of value provided to physicians and teaching hospitals and certain ownership and investment interests held by physicians or their immediate family members in applicable manufacturers and group purchasing organizations; and
- State law equivalents of each of the above federal laws, such as the Anti-Kickback Statute and False Claims Act, and state laws concerning security and privacy of health care information, which may differ in substance and application from state-to-state thereby complicating compliance efforts.

The ACA broadened the reach of the fraud and abuse laws by, among other things, amending the intent requirement of the federal Anti-Kickback Statute and the applicable criminal healthcare fraud statutes contained within 42 U.S.C. Section 1320a-7b. Pursuant to the statutory amendment, a person or entity no longer needs to have actual knowledge of this statute or specific intent to violate it in order to have committed a violation. In addition, the ACA provides that the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act or the civil monetary penalties statute. Many states have adopted laws similar to the federal Anti-Kickback Statute, some of which apply to the referral of patients for healthcare items or services reimbursed by any source, not only the Medicare and Medicaid programs.

As noted above, the federal False Claims Act prohibits anyone from, among other things, knowingly presenting, or causing to be presented, false or fraudulent claims for payment from federal programs, including Medicare and Medicaid. Although we would not submit claims directly to payors, manufacturers can be held liable under these laws if they are deemed to “cause” the submission of false or fraudulent claims by, for example, providing inaccurate billing or coding information to customers. In addition, our future activities relating to the reporting of wholesaler or estimated retail prices for our products, the reporting of prices used to calculate Medicaid rebate information and other information affecting federal, state, and third-party reimbursement for our products, and the sale and marketing of our products are subject to scrutiny under this law. For example, pharmaceutical companies have been prosecuted under the federal False Claims Act in connection with their off-label promotion of drugs. Penalties for such violations could include three times the actual damages sustained by the government, mandatory civil penalties between \$10,781 and \$21,563 for each separate false claim, exclusion from participation in federal healthcare programs, and the potential implication of various federal criminal statutes. Private individuals also have the ability to bring actions under the federal False Claims Act, or *qui tam* actions, and certain states have enacted laws based on the federal False Claims Act.

#### **Pharmaceutical Coverage, Pricing and Reimbursement**

In the United States and markets in other countries, sales of any products for which we receive regulatory approval for commercial sale will depend in part on the availability of reimbursement from third party payors, including government health administrative authorities, managed care providers, private health insurers and other organizations. Third party payors are increasingly examining the medical necessity and cost-effectiveness of medical products and services, in addition to their safety and efficacy, and, accordingly, significant uncertainty exists as to the reimbursement status of newly approved therapeutics. Adequate third-party reimbursement may not be available for our products to enable us to realize an appropriate return on our investment in research and product development. We are unable to predict the future course of federal or state health care legislation and regulations, including any changes, repeal, or judicial invalidation of some or all of the provisions of the Affordable Care Act. The Affordable Care Act and further changes in the law or regulatory framework could have a material adverse effect on our business.



## International Regulation

In addition to regulations in the United States, there are a variety of foreign regulations governing clinical trials and commercial sales and distribution of any product candidates. The approval process varies from country to country, and the time may be longer or shorter than that required for FDA approval.

## Employees

As of December 31, 2021, we had 4 full-time employees. None of our employees are represented by a labor union and we consider our employee relations to be good.

## Item 1A. Risk Factors

*The following information sets forth risk factors that could cause our actual results to differ materially from those contained in the forward-looking statements we have made in this Form 10-K and those we may make from time to time. You should carefully consider the risks described below, in addition to the other information contained in this Form 10-K, before making an investment decision. Our business, financial condition or results of operations could be harmed by any of these risks. The risks and uncertainties described below are not the only ones we face. Additional risks not presently known to us or other factors not perceived by us to present significant risks to our business at this time also may impair our business operations.*

### Risks Pertaining to Our Stockholders Agreement with InvaGen Pharmaceuticals

While the SPMA has been terminated, InvaGen retains certain rights pursuant to the Stockholders Agreement between us and InvaGen. These rights exist as long as InvaGen maintains at least 75% of the common shares acquired in the first stage closing. The following are some of the actions that shall not be taken without the prior written consent of InvaGen:

- increase in authorized shares of our stock;
- any agreement or transaction that would adversely treat the holders of our common shares as compared to the holders of our Class A Preferred Shares;
- issuance of any shares of our capital stock or any securities convertible into, or other rights to acquire, shares of our capital stock (including options, warrants or bonds), except for issuances to our officers for services performed;
- any transfer or license of any asset for less than fair market value, as determined by a recognized independent valuation firm agreed upon by us and InvaGen; or
- entry into any transaction or agreement with any affiliate of ours (including Fortress or its Affiliates).

### Risks Pertaining to the Influence of Fortress

#### ***Fortress controls a voting majority of our common stock.***

Pursuant to the terms of the Class A Preferred Stock held by Fortress, Fortress will be entitled to cast, for each share of Class A Preferred Stock held by Fortress, the number of votes that is equal to 1.1 times a fraction, the numerator of which is the sum of (A) the aggregate number of shares of outstanding common stock and (B) the whole shares of common stock into which the shares of outstanding the Class A Preferred Stock are convertible and the denominator of which is the aggregate number of shares of outstanding Class A Preferred Stock, or the Class A Preferred Stock Ratio. Thus, Fortress will at all times have voting control of us. Further, for a period of ten years from the date of the first issuance of shares of Class A Preferred Stock, the holders of record of the shares of Class A Preferred Stock (or other capital stock or securities issued upon conversion of or in exchange for the Class A Preferred Stock), exclusively and as a separate class, shall be entitled to appoint or elect the majority of our directors.

***At such time (if ever) as InvaGen no longer holds at least 75% of the Avenue shares it received in its initial 2019 equity subscription, Fortress would have the right to receive a significant grant of shares of our common stock annually, which would result in the dilution of your holdings of common stock upon each grant, which could reduce their value.***

Under the terms of the Amended and Restated Founders Agreement, which became effective September 13, 2016, Fortress is entitled to receive a grant of shares of our common stock equal to 2.5% of the gross amount of any equity or debt financing. Additionally, the holders of Class A Preferred Stock, as a class, are to receive an annual dividend, payable in shares of common stock in an amount equal to 2.5% of our fully-diluted outstanding capital stock as of the business day immediately prior to the date such dividend is payable. Fortress currently owns all outstanding shares of Class A Preferred Stock. At our Annual Meeting of the Stockholder's held on June 13, 2018, the Company's shareholders approved an amendment to the Company's Third Amended and Restated Certificate of Incorporation, amending the Class A Preferred dividend payment date from February 17 to January 1 of each year. Fortress' right to receive this dividend was contractually waived in connection with the Waiver and Termination Agreement signed on November 12, 2018 between Avenue, Fortress and InvaGen, but Fortress' right to receive such dividend will be revived at such time (if ever) as InvaGen no longer holds at least 75% of the Avenue shares it received in its initial 2019 equity subscription. These potential future share issuances to Fortress and any other holder of Class A Preferred Stock will dilute your holdings in our common stock and, if our value has not grown proportionately over the prior year, would result in a reduction in the value of your shares. The Amended and Restated Founders Agreement has a term of 15 years and renews automatically for subsequent one-year periods unless terminated by Fortress or upon a Change in Control (as defined in the Amended and Restated Founders Agreement).

***We might have received better terms from unaffiliated third parties than the terms we receive in our agreements with Fortress.***

The agreements we entered into with Fortress in connection with the separation include the Management Services Agreement, or the MSA, and the Founders Agreement. While we believe the terms of these agreements are reasonable, they might not reflect terms that would have resulted from arm's-length negotiations between unaffiliated third parties. The terms of the agreements relate to, among other things, payment of a royalty on product sales and the provision of employment and transition services. We might have received better terms from third parties because, among other things, third parties might have competed with each other to win our business. Effective November 12, 2018, the MSA fee and certain payment obligations pursuant to the Founders Agreement were waived under the Waiver and Termination Agreement signed between Avenue, Fortress and InvaGen.

***The ownership by our executive officers and some of our directors of equity securities of Fortress and/or rights to acquire equity securities of Fortress might create, or appear to create, conflicts of interest.***

Because of their current or former positions with Fortress, some of our executive officers and directors own shares of Fortress common stock and/or options to purchase shares of Fortress common stock. Their individual holdings of common stock and/or options to purchase common stock of Fortress may be significant compared to their total assets. Ownership by our directors and officers, after our separation, of common stock and/or options to purchase common stock of Fortress create or might appear to create conflicts of interest when these directors and officers are faced with decisions that could have different implications for Fortress than for us. For instance, and by way of example, if there were to be a dispute between Fortress and us regarding the calculation of the royalty fee due to Fortress under the terms of the Founders Agreement, then certain of our officers and directors may have and will appear to have a conflict of interest with regard to the outcome of such dispute.

#### Risks Pertaining to Our Business and Industry.

***We currently have no drug products for sale, and only one drug product candidate, IV Tramadol. We are dependent on the success of IV Tramadol and cannot guarantee that this product candidate will receive regulatory approval or be successfully commercialized.***

Our business success depends on our ability to obtain regulatory approval to successfully commercialize, market and sell our only product candidate, IV Tramadol, and any significant delays in obtaining approval to commercialize, market and sell IV Tramadol will have a substantial adverse impact on our business and financial condition.

If the application for IV Tramadol is approved, our ability to generate revenues from IV Tramadol will depend on our ability to:

- establish and maintain agreements with our contract manufacturers, wholesalers, distributors and group purchasing organizations on commercially reasonable terms;

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- obtain sufficient quantities of IV Tramadol from qualified third-party manufacturers that manufacture in accordance with Current Good Manufacturing Practices (CGMP) requirements, as required to meet commercial demand at launch and thereafter;
- hire, train, deploy and support our sales force;
- create market demand for IV Tramadol through our own marketing and sales activities, and any other arrangements to promote this product candidate we may later establish;
- conduct such marketing and sales activities in a manner that is compliant with federal and state laws, including restrictions on off-label promotion and anti-kickback requirements;
- obtain and maintain government and private payer reimbursement for our product; and
- maintain patent protection and regulatory exclusivity for IV Tramadol.

***We may not receive regulatory approval for IV Tramadol or future product candidates, or its or their approvals may be delayed, which would have a material adverse effect on our business and financial condition.***

IV Tramadol and other future product candidates and the activities associated with their development and commercialization, including their design, testing, manufacture, safety, efficacy, recordkeeping, labeling, storage, approval, advertising, promotion, sale and distribution, are subject to premarket approval and comprehensive regulation by the FDA, DEA and other regulatory agencies in the United States. Failure to obtain marketing approval for IV Tramadol or any future product candidates will prevent us from commercializing our product candidates. We have not received approval to market IV Tramadol from regulatory authorities in any jurisdiction. We have only limited experience in conducting preclinical and clinical studies and filing and supporting the applications necessary to gain marketing approvals and expect to rely on third party contract research organizations as well as consultants and vendors to assist us in this process. Securing marketing approval requires the submission of extensive preclinical and clinical data and supporting information to regulatory authorities for each therapeutic indication to establish the product candidate's safety and efficacy. Securing marketing approval also requires the submission of information about the product manufacturing process to, and inspection of manufacturing facilities by, the regulatory authorities.

Our product candidate IV Tramadol or any future product candidates must meet FDA's standards for safety and efficacy, but may be determined not to be effective, to be only moderately effective, to not be safe for use in its intended population, or may prove to have undesirable or unintended side effects, toxicities or other characteristics that may preclude our obtaining marketing approval or prevent or limit commercial use.

On October 12, 2020, we announced that we had received a Complete Response Letter ("CRL") from the FDA regarding our New Drug Application ("NDA") for IV Tramadol. The CRL cited deficiencies related to the terminal sterilization validation and stated that IV Tramadol, intended to treat patients in acute pain who require an opioid, is not safe for the intended patient population.

On February 12, 2021, we resubmitted our NDA to the FDA for IV Tramadol. The NDA resubmission followed the receipt of official minutes from a Type A meeting with the FDA. The resubmission included revised language relating to the proposed product label and a report relating to terminal sterilization validation. On June 14, 2021, we announced that we had received a second Complete Response Letter (the "Second CRL") from the FDA regarding the Company's NDA for IV Tramadol. The Second CRL stated that the delayed and unpredictable onset of analgesia with IV Tramadol does not support its benefit as a monotherapy to treat patients in acute pain and that there is insufficient information to support that IV tramadol in combination with other analgesics is safe and effective for the intended patient population. We continue to pursue regulatory approval for IV Tramadol and had a Type A meeting with the FDA in July 2021. The FDA did not deviate from any of the positions the FDA previously took in the First CRL and the Second CRL. We submitted a formal dispute resolution request ("FDRR") with the Office of Neuroscience of the FDA on July 27, 2021. On August 26, 2021, we received an Appeal Denied Letter from the Office of Neuroscience of the FDA in response to the FDRR submitted on July 27, 2021. On August 31, 2021, we submitted a FDRR with the Office of New Drugs ("OND") of the FDA. On October 21, 2021, we received a written response from the OND of the FDA stating that the OND needs additional input from an Advisory Committee in order to reach a decision on the FDRR. Our ability to potentially commercialize IV Tramadol, and the timing of any potential commercialization, are dependent on the FDA's review of the FDRR for IV Tramadol, whether or not the FDA ultimately approves IV Tramadol, and potentially on whether or not we procure additional capital.

If our product candidate or any future product candidate receives marketing approval, the approved label indication and accompanying label information may be required to contain information limiting the approved use of our drug, which could limit sales of the product. In addition, our third-party supplier may be subject to an inspection by the FDA that identifies deficiencies in its manufacturing facilities and concludes they are not operating in compliance with CGMP requirements, which in turn, may force us to identify, qualify and rely upon additional suppliers.

The process of obtaining marketing approvals, both in the United States and abroad, is expensive, may take many years if approval is granted at all, and can vary substantially based upon a variety of factors, including the type, complexity and novelty of the product candidates involved. Changes in marketing approval policies during the development period, changes in or the enactment of additional statutes or regulations, or changes in the regulatory review process for each submitted product application, may cause delays in the approval or rejection of an application. Regulatory authorities have substantial discretion in the approval process and may refuse to accept any application or may decide that our data is insufficient for approval and require additional preclinical studies or clinical trials. In addition, varying interpretations of the data obtained from preclinical and clinical testing could delay, limit or prevent marketing approval of a product candidate. Any marketing approval we ultimately obtain may be limited or subject to restrictions or post-approval commitments that render the approved product not commercially viable.

If we experience delays in obtaining approval or if we fail to obtain approval of our product candidate or any future product candidates, the commercial prospects for our product candidates may be harmed and our ability to generate revenue will be materially impaired.

In addition, even if we were to obtain approval, the approval of the indication for our product candidate by such regulatory authorities may, among other things, be more limited than we request. Such regulatory authorities may not approve the price we intend to charge for our product, 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. These regulatory authorities may also require the label to contain warnings, contraindications, or precautions that limit the commercialization of that product. Any of these scenarios could compromise the commercial prospects for our product candidate or any future product candidates.

***If serious adverse or unacceptable side effects are identified during the development of IV Tramadol or our future product candidates, we may need to abandon or limit our development of some of our product candidates.***

If our product candidate or future product candidates are associated with undesirable side effects in clinical trials or have characteristics that are unexpected, we may need to abandon their development or limit development to more narrow uses or subpopulations in which the undesirable side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective. In our industry, many compounds that initially showed promise in early stage testing have later been found to cause undesirable side effects that prevented further development of the compound. In the event that our preclinical or clinical trials reveal a high and unacceptable severity and prevalence of side effects, our trials could be delayed, suspended or terminated and the FDA or comparable foreign regulatory authorities could order us to cease further development or deny approval of our product candidate or future product candidates for any or all targeted indications. The FDA could also issue a letter requesting additional data or information prior to making a final decision regarding whether or not to approve a product candidate. The number of requests for additional data or information issued by the FDA in recent years has increased, and resulted in substantial delays in the approval of several new drugs. Undesirable side effects caused by our product candidate or future product candidates could also result in the inclusion of serious risk information in our product labeling, application of burdensome post-market requirements, or the denial of regulatory approval by the FDA or other regulatory authorities for any or all targeted indications, and in turn prevent us from commercializing and generating revenues from the sale of our product candidate. Drug-related side effects could affect patient recruitment or the ability of enrolled patients to complete the trial and could result in potential product liability claims.

For example, some of the adverse events observed in the IV Tramadol clinical trials completed to date include nausea, dizziness, drowsiness, tiredness, sweating, vomiting, dry mouth, somnolence and hypotension.

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

- regulatory authorities may require the addition of serious risk-related labeling statements, specific warnings, precautions, or contraindication;
- regulatory authorities may suspend or withdraw their approval of the product, or require the suspension of manufacturing, or the recall of the product from the market;
- regulatory authorities may require implementation of burdensome post-market risk mitigation strategies and practices;
- we may be required to change the way the product is administered, conduct additional clinical trials or change the labeling of the product; or
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining marketing approval and market acceptance of our product candidate or future product candidates or could substantially increase our commercialization costs and expenses, which in turn could delay or prevent us from generating significant revenues from its sale.

***We may not be able to manage our business effectively if we are unable to attract and retain key personnel.***

We may not be able to attract or retain qualified management and commercial, scientific and clinical personnel in the future due to the intense competition for qualified personnel among biotechnology, pharmaceutical and other businesses. If we are not able to attract and retain necessary personnel to accomplish our business objectives, we may experience constraints that will significantly impede the achievement of our development objectives, our ability to raise additional capital and our ability to implement our business strategy.

***Our employees, consultants, or third-party partners may engage in misconduct or other improper activities, including those that result in noncompliance with certain regulatory standards and requirements, which could have a material adverse effect on our business.***

We are exposed to the risk of employee fraud or other misconduct. Misconduct by employees, consultants, or third-party partners could include intentional failures to comply with FDA regulations, provide accurate information to the FDA, comply with manufacturing standards we have established, comply with federal and state healthcare fraud and abuse laws and regulations, report financial information or data accurately or disclose unauthorized activities to us. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Employee, consultant, or third-party misconduct could also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation, as well as civil and criminal liability. The precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business and results of operations, including the imposition of significant fines or other civil and/or criminal sanctions.

*If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could harm our business.*

We are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Our operations involve the use of hazardous and flammable materials, including chemicals and biological materials. Our operations also produce hazardous waste products. 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. Although we believe that the safety procedures for handling and disposing of these materials comply with the standards prescribed by these laws and regulations, we cannot eliminate the risk of accidental 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. We also could incur significant costs associated with civil or criminal fines and penalties for failure to comply with such laws and regulations.

Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, this insurance may not provide adequate coverage against potential liabilities. We do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our storage or disposal of biological, hazardous or radioactive materials.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may impair our research, development or production efforts. Our failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

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

We are an "emerging growth company" as that term is used in the JOBS Act, and may remain an emerging growth company until the earlier of (1) the last day of the fiscal year (a) following the fifth anniversary of the completion of the initial public offering of our common stock, (b) in which we have total annual gross revenue of at least \$1.07 billion, or (c) in which we are deemed to be a large accelerated filer, which means the market value of our outstanding common stock that are held by non-affiliates exceeds \$700 million as of the prior June 30, and (2) the date on which we have issued more than \$1.0 billion in non-convertible debt during the prior three year period. For so long as we remain an emerging growth company, we are permitted and intend to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- being permitted to provide only two years of audited financial statements, in addition to any required unaudited interim financial statements, with correspondingly reduced "Management's Discussion and Analysis of Financial Condition and Results of Operations" disclosure in this Annual Report on Form 10-K;
- not being required to comply with the auditor attestation requirements in the assessment of our internal control over financial reporting;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements;
- reduced disclosure obligations regarding executive compensation; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of these accounting standards until they would otherwise apply to private companies. We have elected to take advantage of this extended transition period.

We are also a smaller reporting company, and we will remain a smaller reporting company until the fiscal year following the determination that our voting and non-voting common shares held by non-affiliates is more than \$250 million measured on the last business day of our second fiscal quarter, or our annual revenues are more than \$100 million during the most recently completed fiscal year and our voting and non-voting common shares held by non-affiliates is more than \$700 million measured on the last business day of our second fiscal quarter. Similar to emerging growth companies, smaller reporting companies are able to provide simplified executive compensation disclosure, are exempt from the auditor attestation requirements of Section 404, and have certain other reduced disclosure obligations, including, among other things, being required to provide only two years of audited financial statements and not being required to provide selected financial data, supplemental financial information or risk factors.

We have elected to take advantage of certain of the reduced reporting obligations. We cannot predict whether investors will find our common stock less attractive if we rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be reduced or more volatile.

***We are a “controlled company” within the meaning of NASDAQ listing standards and, as a result, qualify for, and rely on, exemptions from certain corporate governance requirements. You will not have the same protections afforded to stockholders of companies that are subject to such requirements.***

We are a “controlled company” within the meaning of NASDAQ listing standards. Under these rules, a company of which more than 50% of the voting power is held by an individual, a group or another company is a “controlled company” and may elect not to comply with certain corporate governance requirements of NASDAQ, including (i) the requirement that a majority of the Board of Directors consist of independent directors, (ii) the requirement that we have a nominating and corporate governance committee that is composed entirely of independent directors with a written charter addressing the committee’s purpose and responsibilities and (iii) the requirement that we have a compensation committee that is composed entirely of independent directors with a written charter addressing the committee’s purpose and responsibilities. We intend to rely on some or all of these exemptions.

Accordingly, you will not have the same protections afforded to stockholders of companies subject to all of the corporate governance requirements of NASDAQ.

***Certain of our officers and directors serve in similar roles with our parent company, affiliates, related parties and other parties with whom we transact business; ongoing and future relationships and transactions between these parties could result in conflicts of interest.***

We share directors and/or officers with certain of our parent company, affiliates, related parties or other companies with which we transact business, and such arrangements could create conflicts of interest in the future, including with respect to the allocation of corporate opportunities. While we believe that we have put in place policies and procedures to identify such conflicts and that any existing agreements that may give rise to such conflicts and any such policies or procedures were negotiated at arm’s length in conformity with fiduciary duties, such conflicts of interest may nonetheless arise. The existence and consequences of such potential conflicts could expose us to lost profits, claims by our investors and creditors, and harm to our results of operations.

#### Risks Pertaining to Our Finances

***We have incurred significant losses since our inception. We expect to incur losses for the foreseeable future, and may never achieve or maintain profitability.***

We are an emerging growth company with a limited operating history. We have focused primarily on in-licensing and developing IV Tramadol, with the goal of supporting regulatory approval for this product candidate. We have incurred losses since our inception in February 2015.

These losses, among other things, have had and will continue to have an adverse effect on our stockholders’ equity and working capital. We expect to continue to incur significant operating losses for the foreseeable future. We also do not anticipate that we will achieve profitability for a period of time after generating material revenues, if ever. If we are unable to generate revenues, we will not become profitable and may be unable to continue operations without continued funding. Because of the numerous risks and uncertainties associated with developing pharmaceutical products, we are unable to predict the timing or amount of increased expenses or when or if, we will be able to achieve profitability. In addition, the Company cannot be certain that additional funding will be available on acceptable terms, or at all.

Our net losses may fluctuate significantly from quarter to quarter and year to year. We anticipate that our expenses will increase substantially if:

- IV Tramadol or other future product candidates are approved for commercial sale, due to the necessity in establishing adequate commercial infrastructure to launch such candidate or candidates without substantial delays, including hiring, sales and marketing personnel, and contracting with third parties for warehousing, distribution, cash collection and related commercial activities;
- we are required by the FDA, or foreign regulatory authorities, to perform studies in addition to those currently expected;
- there are any delays in completing our clinical trials or the development of any of our product candidates;
- we execute other collaborative, licensing or similar arrangements and the timing of payments we may make or receive under these arrangements;
- there are variations in the level of expenses related to our future development programs;
- there are any product liability or intellectual property infringement lawsuits in which we may become involved; and
- there are any regulatory developments affecting IV Tramadol or the product candidates of our competitors.

Our ability to become profitable depends upon our ability to generate revenue. To date, we have not generated any revenue from our development stage product, and we do not know when, or if, we will generate any revenue. Our ability to generate revenue depends on a number of factors, including, but not limited to, our ability to:

- obtain regulatory approval for IV Tramadol, or any other product candidates that we may license or acquire;
- manufacture commercial quantities of IV Tramadol or other product candidates, if approved, at acceptable cost levels; and
- develop a commercial organization and the supporting infrastructure required to successfully market and sell IV Tramadol or other product candidates, 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 depress our value and could impair our ability to raise capital, expand our business, maintain our research and development efforts, diversify our product offerings or even continue our operations. A decline in our value could also cause you to lose all or part of your investment.

***Our short operating history makes it difficult to evaluate our business and prospects.***

We were incorporated on February 9, 2015, and have only been conducting operations with respect to IV Tramadol since February 17, 2015. We have not yet demonstrated an ability to successfully obtain regulatory approvals, manufacture a commercial scale product, or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful product commercialization. Consequently, any predictions about our future performance may not be as accurate as they could be if we had a history of successfully developing and commercializing pharmaceutical products.

In addition, as a young business, we may encounter unforeseen expenses, difficulties, complications, delays and other known and unknown factors. We will need to expand our capabilities to support commercial activities. We may not be successful in adding such capabilities.

We expect our financial condition and operating results to continue to fluctuate significantly from quarter to quarter and year to year due to a variety of factors, many of which are beyond our control. Accordingly, you should not rely upon the results of any past quarterly period as an indication of future operating performance.



***There is substantial doubt about our ability to continue as a going concern, which may hinder our ability to obtain future financing.***

Our financial statements as of December 31, 2021 have been prepared under the assumption that we will continue as a going concern for the next twelve months. As of December 31, 2021, we had cash and cash equivalents of \$3.8 million and an accumulated deficit of \$77.0 million. We do not believe that our cash and cash equivalents are sufficient for the next twelve months. As a result of our financial condition and other factors described herein, there is substantial doubt about our ability to continue as a going concern. Our ability to continue as a going concern will depend on our ability to obtain additional funding, as to which no assurances can be given. We continue to analyze various alternatives, including potentially obtaining lines of credit, debt or equity financings or other arrangements. Our future success depends on our ability to raise capital and/or implement the various strategic alternatives discussed above. We cannot be certain that these initiatives or raising additional capital, whether through selling additional debt or equity securities or obtaining a line of credit or other loan, will be available to us or, if available, will be on terms acceptable to us. If we issue additional securities to raise funds, these securities may have rights, preferences, or privileges senior to those of our common stock, and our current shareholders may experience dilution. If we are unable to obtain funds when needed or on acceptable terms, we may be required to curtail our current development programs, cut operating costs, forego future development and other opportunities or even terminate our operations.

***We do not have any products that are approved for commercial sale and therefore do not expect to generate any revenues from product sales in the foreseeable future, if ever.***

We have not generated any product related revenues to date. To obtain revenues from sales of our product candidates, we must succeed, either alone or with third parties, in developing, obtaining regulatory approval for, manufacturing and marketing products with commercial potential. We may never succeed in these activities, and we may not generate sufficient revenues to continue our business operations or achieve profitability.

***We will require substantial additional funding, which may not be available to us on acceptable terms, or at all. If we fail to raise the necessary additional capital, we may be unable to raise capital when needed, which would force us to delay, reduce or eliminate our product development programs or commercialization efforts.***

Our operations have consumed substantial amounts of cash since inception. We expect to significantly increase our spending to advance the clinical development and potential regulatory approval of IV Tramadol and launch and commercialize any additional product candidates for which we receive regulatory approval, including building our own commercial organizations to address certain markets. We will require additional capital for the further development and potential commercialization of IV Tramadol or other potential product candidates, as well as to fund our other operating expenses and capital expenditures, and cannot provide any assurance that we will be able to raise funds to complete the development of our product.

We cannot be certain that additional funding will be available on acceptable terms, or at all. 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. We may also seek collaborators for product candidates at an earlier stage than otherwise would be desirable or on terms that are less favorable than might otherwise be available. Any of these events could significantly harm our business, financial condition and prospects.

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

- the potential for delays in our efforts to seek regulatory approval for our product candidate, and any costs associated with such delays;
- the costs of establishing a commercial organization to sell, market and distribute our product candidates;
- the rate of progress and costs of our efforts to prepare for the submission of an NDA for any product candidates that we may in-license or acquire in the future, and the potential that we may need to conduct additional clinical trials to support applications for regulatory approval;
- the costs of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights associated with our product candidates, including any such costs we may be required to expend if our licensors are unwilling or unable to do so;

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- the cost and timing of securing sufficient supplies of our product candidate from our contract manufacturers in preparation for commercialization;
- the effect of competing technological and market developments;
- the terms and timing of any collaborative, licensing, co-promotion or other arrangements that we may establish;
- if one or more of our product candidates are approved, the potential that we may be required to file a lawsuit to defend our patent rights or regulatory exclusivities from challenges by companies seeking to market generic versions of one or more of our product candidates; and
- the success of the commercialization of one or more of our product candidates.

In order to carry out our business plan and implement our strategy, we may need to obtain additional financing and may choose to raise additional funds through strategic collaborations, licensing arrangements, public or private equity or debt financing, bank lines of credit, asset sales, government grants, or other arrangements. We cannot be sure that any additional funding, if needed, will be available on terms favorable to us or at all. Furthermore, any additional equity or equity-related financing may be dilutive to our stockholders, and debt or equity financing, if available, may subject us to restrictive covenants and significant interest costs. If we obtain funding through a strategic collaboration or licensing arrangement, we may be required to relinquish our rights to our product candidate or marketing territories.

Our inability to raise capital when needed would harm our business, financial condition and results of operations, and could cause our stock value to decline or require that we wind down our operations altogether.

***Raising additional capital may cause dilution to our existing stockholders, restrict our operations or require us to relinquish proprietary rights.***

Until such time, if ever, as we can generate substantial product revenue, we expect to finance our cash needs through a combination of equity offerings, debt financings, grants and license and development agreements in connection with any collaborations. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a stockholder. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends.

If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market any potential product candidates that we would otherwise prefer to develop and market ourselves.

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

We are a listed and traded public company. As a public company, we incur significant legal, accounting and other expenses under the Sarbanes-Oxley Act of 2002, as well as rules subsequently implemented by the Securities and Exchange Commission, or SEC, and the rules of any stock exchange on which we may become listed. These rules impose various requirements on public companies, including requiring establishment and maintenance of effective disclosure and financial controls and appropriate corporate governance practices. Our management and other personnel have devoted and will continue to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations increase our legal and financial compliance costs and make some activities more time-consuming and costly. For example, these rules and regulations make it more difficult and more expensive for us to obtain director and officer liability insurance, and we may be required to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. As a result, it may be more difficult for us to attract and retain qualified persons to serve on our Board of Directors, our Board committees or as executive officers.

The Sarbanes-Oxley Act of 2002 requires, among other things, that we maintain effective internal controls for financial reporting and disclosure controls and procedures. As a result, we are required to periodically perform an evaluation of our internal controls over financial reporting to allow management to report on the effectiveness of those controls, as required by Section 404 of the Sarbanes-Oxley Act. However, while we remain either a non-accelerated filer and/or an emerging growth company, we will not be required to include an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. To achieve compliance with Section 404 within the prescribed period, we have engaged in a process to document and evaluate our internal control over financial reporting. These efforts to comply with Section 404 and related regulations have required, and continue to require, the commitment of significant financial and managerial resources. While we anticipate maintaining the integrity of our internal controls over financial reporting and all other aspects of Section 404, we cannot be certain that a material weakness will not be identified when we test the effectiveness of our control systems in the future. If a material weakness is identified, we could be subject to sanctions or investigations by the SEC or other regulatory authorities, which would require additional financial and management resources, costly litigation or a loss of public confidence in our internal controls, which could have an adverse effect on the market price of our stock.

***If we fail to satisfy applicable listing standards, including compliance with the minimum market value of listed securities requirement, our common stock may be delisted from the NASDAQ Capital Market.***

On September 2, 2021, we received a letter from the Listing Qualifications Department of the NASDAQ Stock Market (“Nasdaq”) notifying us that, based upon its review for the last 30 consecutive business days, we did not meet the continuing listing requirements of Nasdaq Marketplace Rule 5550(b)(2), which requires that we maintain a minimum market value of listed securities of at least \$35 million. Nasdaq also informed us that we did not meet the requirements of Listing Rules 5550(b)(1) and 5550(b)(3). Under Nasdaq’s Listing Rules, we had 180 calendar days from the date of the notification to regain compliance, which expired on March 1, 2022. We were unable to regain compliance during this 180-day period. Subsequently, on March 2, 2022, we received an additional notification from the Listing Qualifications Department stating that due to the deficiency, the Company’s securities would be delisted from Nasdaq on March 11, 2022, unless the Company appealed Nasdaq’s determination to a Hearings Panel (the “Panel”). A hearing request would stay the suspension of the Company’s securities pending the Panel’s decision. On March 9, 2022, the Company submitted the hearing request. The hearing will take place in April and the Panel’s decision will follow shortly after. The pendency of the appeal does not have an immediate effect on the listing of our common stock and our common stock will continue to trade on the Nasdaq under the symbol “ATXI”.

Additionally, as previously disclosed on February 8, 2022, we received a letter from the Regulations Department of the Nasdaq Stock Market indicating that the closing bid price of our common stock has been below \$1.00 per share for 30 consecutive business days, and that, therefore, we are not in compliance with Nasdaq Listing Rule 5550(a)(2), which is the minimum bid price requirement for continued listing on the Nasdaq Capital Market. Pursuant to Nasdaq Listing Rule 5810(c)(3)(A), we have automatically been afforded a 180-calendar day grace period, or until August 8, 2022, to regain compliance. The continued listing standard will be met if the closing bid price of our common stock is at least \$1.00 per share for a minimum of ten consecutive business days during the 180-calendar day grace period. If we are not in compliance by August 8, 2022, we may be afforded a second 180-calendar day period to regain compliance if it meets certain requirements.

There can be no assurances, however, that we will be successful in regaining compliance with the continued listing requirements and maintaining the listing of our common stock on the Nasdaq Capital Market. Delisting from the Nasdaq could adversely affect our ability to raise additional financing through the public or private sale of equity securities, would significantly affect the ability of investors to trade our securities and would negatively affect the value and liquidity of our common stock. Delisting could also have other negative results, including the potential loss of confidence by employees, the loss of institutional investor interest and fewer business development opportunities. If our common stock is delisted by the Nasdaq the price of our common stock may decline and our common stock may be eligible to trade on the OTC Bulletin Board, another over-the-counter quotation system, or on the pink sheets where an investor may find it more difficult to dispose of their common stock or obtain accurate quotations as to the market value of our common stock. Further, if we are delisted, we would incur additional costs under requirements of state “blue sky” laws in connection with any sales of our securities. These requirements could severely limit the market liquidity of our common stock and the ability of our stockholders to sell our common stock in the secondary market.

***In the event we were to pursue a bankruptcy reorganization under the U.S. Bankruptcy Code, we would be subject to the risks and uncertainties associated with bankruptcy proceedings, including the potential delisting of our common stock from trading on Nasdaq.***

We continue to experience significant financial and operating challenges that present substantial doubt as to our ability to continue as a going concern. If we continue to experience financial and operating challenges or are unsuccessful or unable to raise additional capital, there is risk that it will be necessary for us to commence reorganization proceedings. In the event we were to pursue such a restructuring, our operations, our ability to develop and execute our business plan and our continuation as a going concern would be subject to the risks and uncertainties associated with bankruptcy proceedings, including, among others: the high costs of bankruptcy proceedings and related fees; our ability to maintain the listing of our common stock on the Nasdaq Capital Market; our ability to obtain sufficient financing to allow us to emerge from bankruptcy and execute our business plan post-emergence, and our ability to comply with terms and conditions of that financing; our ability to maintain our relationships with our lenders, counterparties, vendors, suppliers, employees and other third parties; our ability to maintain contracts that are critical to our operations on reasonably acceptable terms and conditions; the ability of third parties to use certain limited safe harbor provisions of the U.S. Bankruptcy Code to terminate contracts without first seeking bankruptcy court approval; and the actions and decisions of third parties who have claims and/or interests in our bankruptcy proceedings that may be inconsistent with our operational and strategic plans. Any reorganization effected under the U.S. Bankruptcy Code will result in a total loss of your investment in our common stock.

In addition, if we were to commence bankruptcy proceedings, our shares of common stock would likely be delisted from trading on Nasdaq. Nasdaq rules provide that securities of a company that trades on Nasdaq may be delisted in the event that such company seeks bankruptcy protection. In response to a Chapter 11 filing, Nasdaq would likely issue a delisting letter immediately following such a filing. If Nasdaq were to issue such a letter, we would have the opportunity to appeal the determination during which time the delisting would be stayed, but if we did not appeal or otherwise were not successful in our appeal, our common stock would soon thereafter be delisted and our common stock could be traded in the over-the-counter markets. Any delisting of our common stock could result in a substantial decline in the value of our common stock including, among other reasons, for the reduced liquidity of our common stock.

#### Risks Pertaining to Reliance on Third Parties

***If IV Tramadol is approved and our contract manufacturer fails to produce the product in the volumes that we require on a timely basis, to produce the product according to the applicable quality standards and requirements, or to comply with stringent regulations applicable to pharmaceutical drug manufacturers, we may face delays in the commercialization of this product candidate, lose potential revenues or be unable to meet market demand.***

The manufacture of pharmaceutical products requires significant expertise and capital investment, including the development of advanced manufacturing techniques and process controls, and the use of specialized processing equipment. We have entered into a development and supply agreement for the completion of pre-commercialization manufacturing development activities and the manufacture of commercial supplies of IV Tramadol. Any termination or disruption of this relationship may materially harm our business and financial condition, and impact any commercialization efforts for this product candidate.

In order to meet anticipated demand for IV Tramadol, if this product candidate is approved, we currently have one manufacturer to provide us clinical and commercial supply of IV Tramadol in accordance with the CGMP requirements. We also may plan to qualify a backup manufacturer, in order to ensure an alternative source and to mitigate any potential supply issues.

All of our contract manufacturers must comply with strictly enforced federal, state and, where applicable, foreign regulations, including CGMP requirements enforced by the FDA through its inspectional authority over facilities under the FDCA, as well requirements for controlled substance handling and security requirements enforced by DEA, and while we exercise oversight of our suppliers, we have limited direct control over their compliance with these regulations, as reflected in day-to-day operations. Any failure to comply with applicable regulations may result in fines and civil penalties, suspension of production, suspension or delay in product approval, product seizure or recall, or withdrawal of product approval, and would limit the availability of our product. Any quality or compliance issue, manufacturing defect or error discovered after products have been produced and distributed could result in even more significant consequences, including costly recall procedures, re-stocking costs, damage to our reputation and potential for product liability claims.

If the commercial manufacturers upon whom we rely to manufacture IV Tramadol, and any other product candidates we may in-license, fail to deliver sufficient commercial quantities on a timely basis at commercially reasonable prices, we would likely be unable to meet demand for our products and we would lose potential revenues.

***We rely, and expect to continue to rely, on third parties to conduct our preclinical studies and clinical trials, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials or complying with applicable regulatory requirements.***

We have relied on third party contract research organizations and clinical research organizations to conduct some of our preclinical studies and all of our clinical trials for IV Tramadol and may do so any future product candidates. We may continue to rely on third parties, such as contract research organizations, clinical research organizations, clinical data management organizations, medical institutions and clinical investigators, to conduct preclinical studies and clinical trials. The agreements with these third parties might terminate for a variety of reasons, including a failure to perform by the third parties. If we need to enter into alternative arrangements, that could delay our product development activities.

Our reliance on these third parties for research and development activities will reduce our control over these activities but will not relieve us of our legal and regulatory product development responsibilities. For example, we will remain responsible for ensuring that each of our preclinical studies and clinical trials are conducted in accordance with the general investigational plan and protocols for the trial and for ensuring that our preclinical studies are conducted in accordance with good laboratory practice, or GLP, as appropriate. Moreover, the FDA requires us to comply with standards, commonly referred to as good clinical practices, or GCPs, for conducting, recording and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, integrity and confidentiality of trial participants are protected. Regulatory authorities enforce these requirements through periodic inspections of trial sponsors, clinical investigators and trial sites. If we or any of our clinical research organizations fail to comply with applicable GCPs, the clinical data generated in our clinical trials may be deemed unreliable or unacceptable, and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We cannot assure you that upon inspection by a given regulatory authority, such regulatory authority will determine that any of our clinical trials complies with GCP regulations. In addition, our clinical trials must be conducted using products manufactured and produced in accordance with CGMP regulations. Our failure to comply with these regulations may require us to repeat clinical trials, which would delay the regulatory approval process. We also are required to register ongoing clinical trials and post the results of completed clinical trials on a government-sponsored database, ClinicalTrials.gov, within specified timeframes. Failure to do so can result in fines, adverse publicity and civil and criminal sanctions.

The third parties with whom we have contracted to help perform our preclinical studies or clinical trials may also have relationships with other entities, some of which may be our competitors. If these third parties do not successfully carry out their contractual duties, meet expected deadlines or conduct our preclinical studies or 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 our product candidate and will not be able to, or may be delayed in our efforts to, potentially successfully commercialize our product candidate.

If any of our relationships with these third-party contract research organizations or clinical research organizations terminates, we may not be able to enter into arrangements with alternative contract research organizations or clinical research organizations or to do so on commercially reasonable terms. Switching or adding additional contract research organizations or clinical research organizations involves additional cost and requires extensive training and management time and focus. In addition, there is a natural transition period when a new contract research organization or clinical research organization commences work. As a result, delays could occur, which could compromise our ability to meet our desired development timelines. Though we carefully manage our relationships with our contract research organizations or clinical research organizations, there can be no assurance that we will not encounter challenges or delays in the future.

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

We do not own any manufacturing facilities or personnel. We rely, and expect to continue to rely, on third party manufacturers to manufacture our product candidate for preclinical and clinical testing, as well as for commercial manufacture, once our product candidate receives marketing approval. This reliance on third parties increases the risk that we will not have sufficient quantities of our product candidate or products or such quantities at an acceptable cost or quality, which could delay, prevent or impair our development or potential commercialization efforts.

We may be unable to establish any agreements with such third party manufacturers or to do so on acceptable terms. Even if we are able to establish agreements with third party manufacturers, reliance on third party manufacturers entails additional risks, including, but not necessarily limited to:

- reliance on the third party for regulatory compliance and quality assurance;
- raw material or active ingredient shortages from suppliers the third party has qualified for our product;
- the possible breach of the manufacturing agreement by the third party;
- manufacturing delays if our third-party manufacturers give greater priority to the supply of other products over our product candidates or otherwise do not satisfactorily perform according to the terms of the agreement between us;
- the possible misappropriation of our proprietary information, including our trade secrets and know-how; and
- the possible termination or nonrenewal of the agreement by the third party at a time that is costly or inconvenient for us.

The facilities used by our contract manufacturers to manufacture our product candidate is subject to registration requirements, and inspection by the FDA. A pre-approval inspection may be conducted after the submission of an application to the FDA. Although we will have oversight over our suppliers and manufacturers, we do not directly control the manufacturing operations and processes at these facilities, and therefore rely on, our contract manufacturers to ensure full compliance with CGMP regulations with respect to the day-to-day operations related to the manufacture of our product candidates. Third party manufacturers may, following an inspection, be subject to a Form FDA-483 or similar inspectional findings, or a Warning Letter, or may not otherwise be able to comply with the CGMP regulations or similar regulatory requirements outside the United States. The failure of our third-party manufacturers to comply with applicable regulations directly impacts our compliance and could result in sanctions being imposed on us, including clinical holds, fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of product candidates or products, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect supplies of our products.

IV Tramadol and any products that we may develop may compete with other product candidates and products for access to manufacturing facilities. There may be a limited number of manufacturers that both operate under CGMP regulations and are capable of manufacturing for us. Any performance failure on the part of our existing or future manufacturers could delay clinical development or marketing approval. We do not currently have arrangements in place for redundant supply or a second source for bulk drug substance. If our current contract manufacturers cannot perform as agreed, we may be required to replace such manufacturers. We may incur added costs and delays in identifying and qualifying any replacement manufacturers.

The DEA restricts the importation of a controlled substance finished drug product when the same substance is commercially available in the United States, which could reduce the number of potential alternative manufacturers for IV Tramadol.

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

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

***We rely on clinical data and results obtained by third parties that could ultimately prove to be inaccurate or unreliable.***

As part of our strategy to mitigate development risk, we sought to develop a product candidate with a validated mechanism of action, and we utilize biomarkers to assess potential clinical efficacy early in the development process. This strategy necessarily relies upon clinical data and other results obtained by third parties that may ultimately prove to be inaccurate or unreliable. Further, such clinical data and results may be based on products or product candidates that are significantly different from our product candidate or future product candidates. If the third-party data and results we rely upon prove to be inaccurate, unreliable or not applicable to our product candidate or future product candidate, we could make inaccurate assumptions and conclusions about our product candidates and our research and development efforts could be compromised and called into question during the review or any marketing applications we submit.

**Risks Pertaining to Regulatory Approval Process**

***We may not receive regulatory approval for IV Tramadol, or our approval may be significantly delayed due to scientific or regulatory reasons.***

We continue to pursue regulatory approval. We have filed a Formal Dispute Resolution Request (FDRR) in accordance with the FDRR process that exists within the FDA's Center for Drug Evaluation and Research (CDER) for resolving scientific and/or medical disputes between CDER and sponsors that cannot be resolved at the division level. The FDA has significant regulatory discretion, and even where we have submitted information, responses, data and scientific rationales for our positions, the FDA may not accept these responses or may otherwise conclude that we have not fully satisfied their concerns. Even by escalating above the division level by utilizing the FDA's Formal Dispute Resolution process, there is no guarantee that the FDA will accept our FDRR for review, and if they do, that the FDA's agrees with our proposed outcome. There is no guarantee that the FDA will agree with our position, consider the deficiencies cited in the CRLs resolved, or grant regulatory approval. If the FDA agrees to hear our appeal, there is no guarantee that we will successfully establish a path forward regarding the unresolved issues identified by the scientific and technical reviewers. The FDRR process, itself, is inherently uncertain, and could lead to further delays, if the FDA declines to accept the request, decides to issue of an interim response, determines that a decision on the appeal must be made at a different level of management, or believes that new information has been introduced, and decides not to hear the appeal on the grounds that the FDA will only hear an appeal based on the same information that was relied upon to make the original decision.

***Even if IV Tramadol receives regulatory approval, which may not occur, it and any other products we may market will remain subject to substantial regulatory scrutiny.***

IV Tramadol and any other product candidates we may license or acquire will also be subject to ongoing regulatory and compliance requirements, including regular inspections by the FDA and other regulatory authorities. These requirements relate to, among others, labeling, packaging, storage, advertising, promotion, record-keeping and submission of safety and other post-market information and reports, registration and listing requirements, ongoing CGMP requirements relating to manufacturing, quality control, quality assurance and corresponding maintenance of records and documents, requirements regarding the distribution of samples to physicians and recordkeeping of the drug.

The FDA may also impose requirements for costly post-marketing studies or clinical trials and surveillance programs to monitor the safety or efficacy of the product. The FDA closely regulates the post-approval marketing and promotion of drugs to ensure drugs are marketed only for the approved indications and in accordance with the approved labeling. The FDA imposes stringent restrictions on manufacturers' communications regarding off-label use and off-label information and if we do not market our products for only their approved indications and on-label information, we may be subject to enforcement action for off-label marketing as well as false claims liability. Violations of the FDCA relating to the promotion of prescription drugs may lead to investigations alleging violations of federal and state health care fraud and abuse laws, as well as state consumer protection laws.

In addition, later discovery of previously unknown adverse events or other problems with our product, manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may yield various results, including:

- restrictions on such product, operations, manufacturers or manufacturing processes;
- restrictions or new requirements related to the promotion, labeling or marketing of a product;
- restrictions on product distribution or use, including import and export restrictions;

- requirements to conduct post-marketing studies or clinical trials;
- Form FDA-483 findings, or warning letters;
- recall of the product, or withdrawal of the product from the market;
- refusal to approve pending applications or supplements to approved applications that we submit;
- fines, restitution or disgorgement of profits;
- suspension or withdrawal of marketing or regulatory approvals;
- suspension of any ongoing clinical trials;
- refusal to permit the import or export of our product;
- product seizure; or
- injunctions or the imposition of civil or criminal penalties.

The FDA's policies, as well as policies of the DEA, who has jurisdiction over controlled substances and opioids, may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidate. 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 lose any marketing approval that we may have obtained.

***We will need to obtain FDA approval of any proposed product brand names, and any failure or delay associated with such approval may adversely impact our business.***

A pharmaceutical product candidate cannot be marketed in the United States or many other countries until we have completed a rigorous and extensive regulatory review processes, including obtaining the approval of a brand name. Any brand names we intend to use for our product candidates will require approval from the FDA regardless of whether we have secured a formal trademark registration from the U.S. Patent and Trademark Office, or USPTO. The FDA typically conducts a review of proposed product brand names, including an evaluation of potential for confusion with other product names. The FDA may also object to a product brand name if it believes the name inappropriately implies medical claims. If the FDA objects to any of our proposed product brand name, we may be required to adopt an alternative brand name for our product candidate. If we adopt an alternative brand name, we would lose the benefit of our existing trademark applications for such product candidate and may be required to expend significant additional resources in an effort to identify a suitable product brand name that would qualify under applicable trademark laws, not infringe the existing rights of third parties and be acceptable to the FDA. We may be unable to build a successful brand identity for a new trademark in a timely manner or at all, which would limit our ability to potentially commercialize our product candidate.

***Our current and future relationships with customers and third-party payors in the United States and elsewhere may be subject, directly or indirectly, to applicable anti-kickback, fraud and abuse, false claims, transparency, health information privacy and security and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm, administrative burdens and diminished profits and future earnings.***

Healthcare providers, physicians and third-party payors in the United States and elsewhere will play a primary role in the recommendation and prescription of any product candidates for which we obtain marketing approval. Our future arrangements with third-party payors, distributors, retailers, marketers and customers may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations, including, without limitation, the federal Anti-Kickback Statute, the federal False Claims Act, and similar state or foreign laws which may constrain the business or financial arrangements and relationships through which we sell, market and distribute any product candidates for which we obtain marketing approval. In addition, we may be subject to transparency laws and patient privacy regulation by U.S. federal and state governments and by governments in foreign jurisdictions in which we conduct our



business. The applicable federal, state and foreign healthcare laws and regulations that may affect our ability to operate include, but are not necessarily limited to:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made under federal and state healthcare programs, such as Medicare and Medicaid;
- federal civil and criminal false claims laws and civil monetary penalty laws, including the federal False Claims Act, which impose criminal and civil penalties, including civil whistleblower or qui tam actions, against individuals or entities for knowingly presenting, or causing to be presented, to the federal government, including the Medicare and Medicaid programs, claims for payment that are false or fraudulent, making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government, or the knowing retention of an overpayment from government health care programs; the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and their respective implementing regulations, which impose obligations on covered healthcare providers, health plans, and healthcare clearinghouses, as well as their business associates that create, receive, maintain or transmit individually identifiable health information for or on behalf of a covered entity, with respect to safeguarding the privacy, security and transmission of individually identifiable health information;
- the federal Open Payments program, which requires manufacturers of certain drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program, with specific exceptions, to report annually to the Centers for Medicare & Medicaid Services, or CMS, information related to "payments or other transfers of value" made to physicians, which is defined to include doctors, dentists, optometrists, podiatrists and chiropractors, and certain teaching hospitals and applicable manufacturers to report annually to CMS ownership and investment interests held by the physicians and their immediate family members. Data collection began on August 1, 2013 with requirements for manufacturers to submit reports to CMS by March 31, 2014 and 90 days after the end of each subsequent calendar year. Disclosure of such information was made by CMS on a publicly available website beginning in September 2014; and
- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, which may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third party payors, including private insurers; state and foreign laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government or otherwise restrict payments that may be made to healthcare providers; state and foreign laws that require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; and state and foreign laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations may involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, including, without limitation, damages, fines, imprisonment, exclusion from participation in government healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations, which could have a material adverse effect on our business. If any of the physicians or other healthcare providers or entities with whom we expect to do business, including our collaborators, is found not to be in compliance with applicable laws, it may be subject to criminal, civil or administrative sanctions, including exclusions from participation in government healthcare programs, which could also materially affect our business.

***Regulatory approval for any approved product is limited by the FDA to those specific indications and conditions for which clinical safety and efficacy have been demonstrated.***

Any regulatory approval is limited to the specific labeled indication(s) for which a product is deemed to be safe and effective by the FDA. In addition to the FDA approval required for new formulations, any new indication for an approved product also requires FDA approval. If we are not able to obtain FDA approval for any desired future indications for our product, our ability to effectively potentially market and sell our product may be reduced and our business may be adversely affected.

While physicians may choose to prescribe drugs for uses that are not described in the product's approved labeled indication, or for uses that differ from those tested in clinical studies, and thus the basis for approval by the regulatory authorities, our ability to promote the products is limited to those indications that are specifically approved by the FDA. These "off-label" uses are common across medical specialties and may constitute an appropriate treatment for some patients in varied circumstances. Regulatory authorities in the United States generally do not regulate the practice of medicine by physicians with respect to their choice of treatments. Regulatory authorities do, however, restrict communications by pharmaceutical companies in terms of their ability to promote off-label uses or disseminate off-label information. If our promotional activities fail to comply with these requirements, we may be subject to regulatory, compliance, or enforcement action by these authorities. In addition, our failure to follow FDA requirements relating to promotion and advertising may result in a Warning Letter, cause the FDA to suspend or withdraw an approved product from the market, require a recall, require the issuance of corrective advertising, institute fines, or could result in disgorgement of money, operating restrictions, injunctions or civil or criminal prosecution by the government, any of which could harm our reputation and business.

***If the DEA decides to reschedule Tramadol from a Schedule IV controlled substance to a more restrictive Schedule, IV Tramadol could lose its competitive advantage, and our related clinical development and regulatory approval could be delayed or prevented.***

In July 2014, the DEA classified Tramadol as a Schedule IV controlled substance. In comparison, other opioids, which have a high potential for abuse, are classified as Schedule I and II controlled substances. If approved, IV Tramadol will be the only intravenous Schedule IV opioid on the market. However, in the current environment where the opioid epidemic is a recognized problem in the United States, there is a possibility that the DEA could reschedule Tramadol to a more restrictive classification (Schedule I, II or III). Such a rescheduling, or other similar action by DEA, would severely impair IV Tramadol's current competitive advantage over traditional opioids and may affect our ability to potentially market IV Tramadol as a safe alternative pain management product.

**Risks Pertaining to the Commercialization of Product Candidate**

***Current and future legislation and regulation may increase the difficulty and cost for us to obtain marketing approval of, and to commercialize, our product candidate and may affect the prices we are able to obtain.***

In the United States, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of our product candidate, restrict or regulate post-approval activities, and affect our ability to profitably sell any product candidates for which we obtain marketing approval.

In the United States, the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, or the MMA, changed the way Medicare covers and pays for pharmaceutical products. The legislation expanded Medicare coverage for drug purchases by the elderly and certain disabled people and introduced a reimbursement methodology based on average sales prices for physician-administered drugs. In addition, this law provided authority for limiting the number of drugs that will be covered in any therapeutic class. Cost reduction initiatives and other provisions of this law and future laws could decrease the coverage and price that we will receive for any approved products. While the MMA only applies to drug benefits for Medicare beneficiaries, private payors often follow Medicare coverage policy and payment limitations in setting their own payment rates. Therefore, any limitations in reimbursement that results from the MMA may result in reductions in payments from private payors.

In March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, collectively the ACA, became law. The ACA is a sweeping law intended to broaden access to health insurance, reduce or constrain the growth of healthcare spending, enhance remedies against fraud and abuse, add new transparency requirements for the healthcare and health insurance industries, impose new taxes and fees on the health industry and impose additional health policy reforms.

Among the provisions of the ACA of importance to our potential product candidate are the following:

- an annual, nondeductible fee on any entity that manufactures or imports specified branded prescription drugs and biological products;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program;
- expansion of healthcare fraud and abuse laws, including the False Claims Act and the Anti-Kickback Statute, new government investigative powers, and enhanced penalties for noncompliance;
- new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts off negotiated prices;
- extension of manufacturers' Medicaid rebate liability to drugs dispensed to Medicaid managed care organization enrollees;
- expansion of eligibility criteria for Medicaid programs;
- expansion of the entities eligible for discounts under 340B Drug Pricing Program;
- new requirements to report financial arrangements with physicians and teaching hospitals;
- a new requirement to annually report drug samples that manufacturers and distributors provide to physicians; and
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research.

The Supreme Court upheld the ACA in the main challenge to the constitutionality of the law in 2012. Specifically, the Supreme Court held that the individual mandate and corresponding penalty was constitutional because it would be considered a tax by the federal government. The Supreme Court also upheld federal subsidies for purchasers of insurance through federally facilitated exchanges in a decision released in June 2015.

At the end of 2017, Congress passed the Tax Cuts and Jobs Act, which repealed the penalty for individuals who fail to maintain minimum essential health coverage as required by the ACA. Following this legislation, Texas and 19 other states filed a lawsuit alleging that the ACA is unconstitutional as the individual mandate was repealed, undermining the legal basis for the Supreme Court's prior decision. On December 14, 2018, Texas Federal District Court Judge Reed O'Connor issued a ruling declaring that the ACA in its entirety is unconstitutional. Upon appeal, the Fifth Circuit upheld the district court's ruling that the individual mandate is unconstitutional. However, the Fifth Circuit remanded the case back to the district court to conduct a more thorough assessment of the constitutionality of the entire ACA despite the individual mandate being unconstitutional. The Supreme Court agreed to hear the case on appeal from the Fifth Circuit on March 2, 2020 and held oral arguments on November 10, 2020. While this lawsuit has no immediate legal effect on the ACA and its provisions, it is ongoing and the outcome may have a significant impact on our business.

The Bipartisan Budget Act of 2018, the "BBA," which set government spending levels for Fiscal Years 2018 and 2019, revised certain provisions of the ACA. Specifically, beginning in 2019, the BBA increased manufacturer point-of-sale discounts off negotiated prices of applicable brand drugs in the Medicare Part D coverage gap from 50% to 70%, ultimately increasing the liability for brand drug manufacturers. Further, this mandatory manufacturer discount applied to biosimilars beginning in 2019.

The 116th Congress explored legislation intended to address the cost of prescription drugs. Notably, the major committees of jurisdiction in the Senate (Finance Committee, Health, Education, Labor and Pensions Committee, and Judiciary Committee), have marked up legislation intended to address various elements of the prescription drug supply chain. Proposals include a significant overhaul of the Medicare Part D benefit design, addressing patent loopholes, and efforts to cap increases in drug prices. On December 12, 2019, the House of Representatives passed broad legislation that would, among other provisions, require HHS to negotiate drug prices and impose price caps. Failure by a manufacturer to reach an agreement with HHS on the negotiated price could result in significant penalties for prescription drug manufacturers. The 117th Congress convened on January 3, 2021, and could reintroduce many of the bills targeting drug prices. While we cannot predict what proposals may ultimately become law, the elements under consideration could significantly change the landscape in which the pharmaceutical market operates.

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The Trump Administration took several regulatory steps to redirect ACA implementation. The Department of Health and Human Services (HHS) finalized a hospital payment reduction for drugs acquired through the 340B Drug Pricing Program.

Under the Trump Administration, HHS finalized several proposals aimed at lowering drug prices for Medicare beneficiaries and increasing price transparency. For example, the Trump Administration issued an interim final rule on November 27, 2020 implementing a “Most Favored Nation” payment model for Part B drugs that applies international reference pricing to determine reimbursement for certain drugs paid by Medicare Part B. The interim final rule was enjoined by federal courts prior to its implementation date of January 1, 2021, and the lawsuit is ongoing. In addition, HHS, in conjunction with the FDA, finalized four pharmaceutical importation pathways in September 2020: (1) regulations establishing importation of pharmaceuticals from Canada by wholesalers and pharmacists; (2) FDA guidance permitting manufacturers to import their own pharmaceuticals that were originally intended for marketing in other countries; (3) a request for proposals from private sector entities to import prescription drugs for personal use under existing statutory authority; and (4) a request for proposals from private sector entities to reimport insulin under existing statutory authority. Further, on November 11, 2020, the Trump Administration issued a final rule that changes the permissible structure of drug rebates and discounts between drug manufacturers and third-party payors (including pharmacy benefit managers that negotiate drug prices on behalf of such third-party payors). This final rule, often referred to as the “Rebate Rule,” could have significant direct and indirect impacts on drug pricing in both government and commercial markets. With respect to price transparency, the Trump Administration promulgated regulations that require hospitals and third-party payors to disclose prices of items and services, which may impact negotiated rates in the commercial market.

On January 20, 2021, Joe Biden was inaugurated as the 46th president of the United States. As a presidential candidate, Mr. Biden indicated support for several policies aimed at lowering drug prices, including government price negotiation, drug importation, international reference pricing, and price increase controls. The incoming Biden Administration may continue, modify, or repeal many of the drug pricing policies proposed and finalized by the Trump Administration. While we cannot predict which policies the Biden Administration may support and enforce, the policies finalized in the months prior to the beginning of Mr. Biden’s term, if continued, could significantly change the landscape in which the pharmaceutical market operates and significantly impact our ability to effectively market and sell our products.

There have been, and likely will continue to be, legislative and regulatory proposals at the federal and state levels directed at broadening the availability of healthcare and containing or lowering the cost of healthcare products and services. We cannot predict the initiatives that may be adopted in the future. The continuing efforts of the government, insurance companies, managed care organizations and other payors of healthcare services to contain or reduce costs of healthcare may adversely affect:

- the demand for any products for which we may obtain regulatory approval;
- our ability to set a price that we believe is fair for our products;
- our ability to generate revenues and achieve or maintain profitability;
- the level of taxes that we are required to pay; and
- the availability of capital.

In addition, governments may impose price controls, which may adversely affect our future profitability. In January 2020, President Trump signed into law the U.S.-Mexico-Canada (USMCA) trade deal into law. As enacted, there are no commitments with respect to biological product intellectual property rights or data protection, which may create an unfavorable environment across these three countries

We expect that the ACA, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and additional downward pressure on the payment that we receive for any approved drug. Any reduction in reimbursement from Medicare or other government healthcare 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 potentially generate revenue, attain profitability, or commercialize our product.

Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for pharmaceutical products. We cannot be sure whether additional legislative changes will be enacted, or whether FDA regulations, guidance or interpretations will be changed, or what the impact of such changes on the marketing approvals, if any, of our product candidate, may be. In addition, increased scrutiny by the U.S. Congress of the FDA's approval process may significantly delay or prevent marketing approval, as well as subject us to more stringent product labeling and post-marketing conditions and other requirements.

***Public concern regarding the safety of opioid drug products such as IV Tramadol could delay or limit our ability to obtain regulatory approval, result in the inclusion of serious risk information in our labeling, negatively impact market performance, or require us to undertake other activities that may entail additional costs.***

In light of widely publicized events concerning the safety risk of certain drug products, the FDA, members of Congress, the Government Accountability Office, medical professionals and the general public have raised concerns about potential controlled substance drug safety issues. These events have resulted in the withdrawal of drug products, revisions to drug labeling that further limit use of the drug products and the establishment of risk management programs. The Food and Drug Administration Amendments Act of 2007, or FDAAA, grants significant expanded authority to the FDA much of which is aimed at improving the safety of drug products before and after approval. In particular, the new law authorizes the FDA to, among other things, require post-approval studies and clinical trials, mandate changes to drug labeling to reflect new safety information and require risk evaluation and mitigation strategies for certain drugs, including certain currently approved drugs. It also significantly expands the federal government's clinical trial registry and results databank, which we expect will result in significantly increased government oversight of clinical trials. Under the FDAAA, companies that violate these and other provisions of the new law are subject to substantial civil monetary penalties, among other regulatory, civil and criminal penalties. The increased attention to drug safety issues may result in a more cautious approach by the FDA in its review of data from our clinical trials. Data from clinical trials may receive greater scrutiny, particularly with respect to safety, which may make the FDA or other regulatory authorities more likely to require additional preclinical studies or clinical trials. If the FDA requires us to conduct additional preclinical studies or clinical trials prior to approving IV Tramadol, our ability to obtain approval of this product candidate will be delayed. If the FDA requires us to provide additional clinical or preclinical data following the approval of IV Tramadol, the indications for which this product candidate is approved may be limited or there may be specific warnings or limitations on production dosing, and our efforts to commercialize IV Tramadol may be otherwise adversely impacted.

Rising public, medical, Congressional, and agency concern around the prescription of controlled substance drug products to patients and a growing movement to reduce the use of opioid drug products, to develop abuse-deterrent products, and to prevent dependence also could negatively impact our ability to commercialize and generate revenue from IV Tramadol if it is approved for marketing in the United States. Congress has enacted several laws intended to address opioid use disorder, including the Comprehensive Addiction and Recovery Act (CARA) in 2016, the 21<sup>st</sup> Century Cures Act (Cures Act) in 2016, and the Substance Use-Disorder Prevention that Promotes Opioid Recovery and Treatment for Patients and Communities Act (the SUPPORT Act) in 2018. These laws primarily focus on funding for treatment, research, and education, but also include provisions intended to encourage reduction in opioid use, such as funding for research on non-opioid pain treatments. Other legislative and administrative measures at the state and federal level include, or may include in the future, restrictions and limitations on opioid prescribing, limitations on opioid doses dispensed per episode of care, labeling requirements specific to opioids, limitations on FDA approval of opioids, assessment of fees against opioid manufacturers, or reimbursement disincentives specific to opioids.

***We expect intense competition for IV Tramadol, and new products may emerge that provide different or better therapeutic alternatives for our targeted indications.***

The biotechnology and pharmaceutical industries are subject to rapid and intense technological change. We face, and will continue to face, competition in the development and marketing of IV Tramadol from academic institutions, government agencies, research institutions and biotechnology and pharmaceutical companies. There can be no assurance that developments by others will not render IV Tramadol obsolete or noncompetitive. Furthermore, new developments, including the development of other drug technologies and methods of preventing the incidence of disease, occur in the pharmaceutical industry at a rapid pace. These developments may render IV Tramadol obsolete or noncompetitive.

IV Tramadol will compete with well-established products with similar indications. Competing products available for the management of pain include Ofirmev (IV acetaminophen) and IV formulations of NSAIDs such as Dyloject (diclofenac), Toradol (ketorolac), Anjeso (meloxicam) and Caldolor (ibuprofen). In addition, we also expect to compete with agents such as Exparel, a liposome injection of bupivacaine indicated for administration into the surgical site to produce postsurgical analgesia. In addition to approved products, there are a number of product candidates in development for the management of acute pain. The late-stage pain development pipeline is replete with reformulations and fixed-dose combination products of already available therapies. Among specific drug classes, opioid analgesics and NSAIDs represent the greatest number of agents in development. Most investigational opioids that have reached the later stages of clinical development are new formulations of already marketed opioids. Likewise, investigational NSAIDs — mostly lower dose injectable reformulations of already approved compounds — are another significant area of late-stage drug development in the postoperative pain space.

Competitors may seek to develop alternative formulations of IV centrally acting synthetic opioid analgesics for our targeted indications that do not directly infringe on our in-licensed patent rights. The commercial opportunity for IV Tramadol could be significantly harmed if competitors are able to develop alternative formulations outside the scope of our in-licensed patents. Compared to us, many of our potential competitors have substantially greater:

- capital resources;
- development resources, including personnel and technology;
- clinical trial experience;
- regulatory experience;
- expertise in prosecution of intellectual property rights; and
- manufacturing, distribution and sales and marketing experience.

As a result of these factors, our competitors may obtain regulatory approval of their products more rapidly than we are able to or may obtain patent protection or other intellectual property rights that limit our ability to develop or potentially commercialize IV Tramadol. Our competitors may also develop drugs that are more effective, safe, useful and less costly than ours and may be more successful than us in manufacturing and marketing their products.

***If the government or third-party payors fail to provide adequate coverage and payment rates for IV Tramadol or any future products we may license or acquire in the future, if any, or if hospitals choose to use therapies that are less expensive, our potential revenue and prospects for profitability will be limited.***

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. In both domestic and foreign markets, our sales of any future products will depend in part upon the availability of coverage and reimbursement from third party payors. Such third-party payors include government health programs such as Medicare and Medicaid, managed care providers, private health insurers and other organizations. In particular, many U.S. hospitals receive a fixed reimbursement amount per procedure for certain surgeries and other treatment therapies they perform. Because this amount may not be based on the actual expenses the hospital incurs, hospitals may choose to use therapies which are less expensive when compared to our product candidate or future product candidates. Accordingly, IV Tramadol or any other product candidates that we may in-license or acquire, if approved, will face competition from other therapies and drugs for these limited hospital financial resources. We may need to conduct post-marketing studies in order to demonstrate the cost-effectiveness of any future products to the satisfaction of hospitals, other target customers and their third-party payors. Such studies might require us to commit a significant amount of management time and financial and other resources. Net prices for drugs may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by implementation of recently promulgated regulations that permit importation of drugs from countries where they may be sold at lower prices than in the United States. Our future product might not ultimately be considered cost-effective. Adequate third-party coverage and reimbursement might not be available to enable us to maintain price levels sufficient to realize an appropriate return on investment in product development.

***If IV Tramadol does not achieve broad market acceptance, the potential revenues that we generate from its sales will be limited.***

The commercial success of IV Tramadol, if approved, will depend upon its acceptance by the medical community, the ability to ensure that the drug is included in hospital formularies, and coverage and reimbursement for IV Tramadol by third party payors, including government payors. The degree of market acceptance of IV Tramadol or any other product candidate we may license or acquire would depend on a number of factors, including, but not necessarily limited to:

- the efficacy and safety as demonstrated in clinical trials;
- the safety and use of IV Tramadol in its intended patient population;
- the timing of market introduction of such product candidate as well as competitive products;
- the clinical indications for which the drug is approved;
- acceptance by physicians, major operators of cancer clinics and patients of the drug as a safe and effective treatment;
- the safety of such product candidate seen in a broader patient group (i.e., real world use);
- the availability, cost and potential advantages of alternative treatments, including less expensive generic drugs;
- the availability of adequate reimbursement and pricing by third party payors and government authorities;
- the relative convenience and ease of administration of the product candidate for clinical practices;
- the product labeling or product insert required by the FDA or regulatory authority in other countries, including any contradictions, warnings, drug interactions, or other precautions;
- the approval, availability, market acceptance and reimbursement for a companion diagnostic, if any;
- the prevalence and severity of adverse side effects;
- the effectiveness of our sales and marketing efforts;
- changes in the standard of care for the targeted indications for our product candidate or future product candidates, which could reduce the marketing impact of any superiority claims that we could make following FDA approval; and
- potential advantages over, and availability of, alternative treatments.

If any product candidate that we develop does not provide a treatment regimen that is as beneficial as, or is not perceived as being as beneficial as, the current standard of care or otherwise does not provide patient benefit, that product candidate, if approved for commercial sale by the FDA or other regulatory authorities, likely will not achieve market acceptance. Our ability to effectively promote and potentially sell IV Tramadol and any other product candidates we may license or acquire in the hospital marketplace will also depend on pricing and cost effectiveness, including our ability to produce a product at a competitive price and achieve acceptance of the product onto hospital formularies, as well as our ability to obtain sufficient third-party coverage or reimbursement. Since many hospitals are members of group purchasing organizations, which leverage the purchasing power of a group of entities to obtain discounts based on the collective buying power of the group, our ability to potentially attract customers in the hospital marketplace will also depend on our ability to effectively potentially promote our product candidate to group purchasing organizations. We will also need to demonstrate acceptable evidence of safety and efficacy, as well as relative convenience and ease of administration. Market acceptance could be further limited depending on the prevalence and severity of any expected or unexpected adverse side effects associated with our product candidate. If our product candidate is approved but does not achieve an adequate level of acceptance by physicians, health care payors and patients, we may not potentially generate sufficient revenue from this product, and we may not become or remain profitable. In addition, our efforts to educate the medical community and third-party payors on the benefits of our product candidate may require significant resources and may never be successful.

***If we are unable to establish sales, and marketing capabilities or to enter into agreements with third parties to market and sell our product candidate, we may not be successful in commercializing our product candidate if and when it is approved.***

We currently do not have a marketing or sales organization for the marketing and sales of pharmaceutical products since we currently have no drug products for sale, and only one drug product candidate, IV Tramadol. In order to potentially commercialize any product candidate that receives marketing approval, we would need to build out marketing, sales, managerial and other non-technical capabilities or enter into agreements with third party contract organizations to perform these services, and we may not be successful in doing so. In the event of successful development and regulatory approval of IV Tramadol or another product candidate, we might have to build a targeted specialist sales force to market or co-promote the product. There are risks involved with establishing our own sales and marketing capabilities. For example, recruiting and training a sales force is expensive and time consuming and could delay any product launch. If the commercial launch of a product candidate for which we recruit a sales force and establish marketing capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses. This may be costly, and our investment would be lost if we cannot retain or reposition our sales and marketing personnel.

Factors that may inhibit our potential efforts to successfully commercialize our future product, if any, using our own sales and marketing capabilities include, but are not necessarily limited to:

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

As an alternative to establishing our own sales force, we may choose to partner with third parties that have well-established direct sales forces to sell, market and distribute our products. There are risks involved with partnering with third party sales forces, including ensuring adequate training on the product, regulatory, and compliance requirements associated with promotion of the product.

***If we breach the agreement under which we license rights to IV Tramadol, we could lose the ability to continue to develop and potentially commercialize this product candidate.***

In February 2015, Fortress obtained an exclusive license to IV Tramadol for the U.S. market from Revogenex Ireland Ltd., or Revogenex, pursuant to the License Agreement; Fortress subsequently transferred the License Agreement to us. Because we have in-licensed the rights to this product candidate from a third party, if there is any dispute between us and our licensor regarding our rights under the License Agreement, our ability to develop and potentially commercialize this product candidate may be adversely affected. Any uncured, material breach under the License Agreement could result in our loss of exclusive rights to our product candidate and may lead to a complete termination of our related product development efforts.

***We face potential product liability exposure, and if successful claims are brought against us, we may incur substantial liability for IV Tramadol or other product candidates we may license or acquire and may have to limit their commercialization.***

The use of IV Tramadol and any other product candidates we may license or acquire in clinical trials and the sale of any products for which we obtain marketing approval expose us to the risk of product liability claims. For example, we may be sued if any product we develop allegedly causes injury or is found to be otherwise unsuitable during clinical testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability or a breach of warranties. Product liability claims might be brought against us by consumers, health care providers or others using, administering or selling our products. If we cannot successfully defend ourselves against these claims, we will incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- withdrawal of clinical trial participants;
- termination of clinical trial sites or entire trial programs;



- decreased demand for any product candidates or products that we may develop;
- initiation of investigations by regulators;
- impairment of our business reputation;
- costs of related litigation;
- substantial monetary awards to patients or other claimants;
- loss of revenues;
- reduced resources of our management to pursue our business strategy; and
- the inability to commercialize our product candidate or future product candidates.

We have limited product liability insurance coverage for our clinical trials. However, our insurance coverage may not reimburse us or may not be sufficient to reimburse us for any expenses or losses we may suffer. Moreover, insurance coverage is becoming increasingly expensive, and, in the future, we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses due to liability. When needed, we intend to potentially expand our insurance coverage to include the sale of commercial products if we obtain marketing approval for our product candidate in development, but we may be unable to obtain commercially reasonable product liability insurance for any products approved for marketing. On occasion, large judgments have been awarded in class action lawsuits based on drugs that had unanticipated side effects. A successful product liability claim or series of claims brought against us could cause our stock price to fall and, if judgments exceed our insurance coverage, could decrease our cash and adversely affect our business.

#### Risks Pertaining to Intellectual Property and Potential Disputes Thereof

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

Our commercial success will depend in part on obtaining and maintaining patent protection and trade secret protection in the United States with respect to IV Tramadol or any other product candidates that we may license or acquire and the methods we use to manufacture them, as well as successfully defending these patents and trade secrets against third party challenges. We seek to protect our proprietary position by filing patent applications in the United States and abroad related to our product candidate. We will only be able to protect our technologies from unauthorized use by third parties to the extent that valid and enforceable patents or trade secrets cover them.

The patent prosecution process is 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. If our licensors or we fail to obtain or maintain patent protection or trade secret protection for IV Tramadol or any other product candidate we may license or acquire, third parties could use our proprietary information, which could impair our ability to compete in the market and adversely affect our ability to generate revenues and achieve profitability. Moreover, should we enter into other collaborations we may be required to consult with or cede control to collaborators regarding the prosecution, maintenance and enforcement of our patents. Therefore, these patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain, involves complex legal and factual questions and has in recent years been the subject of much litigation. In addition, no consistent policy regarding the breadth of claims allowed in pharmaceutical or biotechnology patents has emerged to date in the United States. The patent situation outside the United States is even more uncertain. The laws of foreign countries may not protect our rights to the same extent as the laws of the United States. For example, European patent law restricts the patentability of methods of treatment of the human body more than United States law does. Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after a first filing, or in some cases at all. Therefore, we cannot know with certainty whether we or our licensors were the first to make the inventions claimed in our owned or licensed patents or pending patent applications, or that we were the first to file for patent protection of such inventions. In the event that a third

party has also filed a U.S. patent application relating to our product candidates or a similar invention, we may have to participate in interference proceedings declared by the USPTO to determine priority of invention in the United States. The costs of these proceedings could be substantial and it is possible that our efforts would be unsuccessful, resulting in a material adverse effect on our U.S. patent position. As a result, the issuance, scope, validity, enforceability and commercial value of our or any of our licensors' patent rights are highly uncertain. Our pending and future patent applications may not result in patents being issued which protect our technology or products, in whole or in part, or which effectively prevent others from commercializing competitive technologies and products. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection. For example, the federal courts of the United States have taken an increasingly dim view of the patent eligibility of certain subject matter, such as naturally occurring nucleic acid sequences, amino acid sequences and certain methods of utilizing same, which include their detection in a biological sample and diagnostic conclusions arising from their detection. Such subject matter, which had long been a staple of the biotechnology and biopharmaceutical industry to protect their discoveries, is now considered, with few exceptions, ineligible in the first place for protection under the patent laws of the United States. Accordingly, we cannot predict the breadth of claims that may be allowed or enforced in our patents (if any) or in those licensed from third parties.

Recent patent reform legislation could increase the uncertainties and costs surrounding the prosecution of our patent applications and affect the validity, enforceability, scope or defense of our issued patents. On September 16, 2011, the Leahy-Smith America Invents Act, or the Leahy-Smith Act, was signed into law. The Leahy-Smith Act includes a number of significant changes to United States patent law. These include provisions that affect the way patent applications are prosecuted and may also affect patent litigation. The USPTO recently developed new regulations and procedures to govern administration of the Leahy-Smith Act, and many of the substantive changes to patent law associated with the Leahy-Smith Act, and in particular, the first-to-file provisions, only became effective on March 16, 2013. Accordingly, it is not clear what, if any, impact the Leahy-Smith Act will have on the operation of our business. However, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have a material, adverse effect on our business and financial condition.

Moreover, we may be subject to a third-party pre-issuance submission of prior art to the USPTO, or become involved in opposition, derivation, reexamination, inter parties review, post-grant review or interference proceedings challenging our patent rights or the patent rights of others. An adverse determination in any such submission, PTAB trial, proceeding or litigation could reduce the scope of, render unenforceable, or invalidate, our patent rights, allow third parties to commercialize our technology or products and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third party patent rights. In addition, if the breadth or strength of protection provided by our patents and patent applications is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize current or future product candidates.

Even if our patent applications issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors from competing with us or otherwise provide us with any competitive advantage. Our competitors may be able to circumvent our owned or licensed patents by developing similar or alternative technologies or products in a non-infringing manner.

The issuance of a patent does not foreclose challenges to its inventorship, scope, validity or enforceability. Therefore, our owned and licensed patents may be challenged in the courts or patent offices in the United States and abroad. Such challenges may result in loss of exclusivity or 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 technology and products, or limit the duration of the patent protection of our technology and products. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such product candidates might expire before or shortly after such product candidates are commercialized. As a result, our owned and licensed patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

***The patent rights that we have in-licensed covering the infusion time and pharmacokinetics, or PK, profile for IV Tramadol are limited to a specific IV formulation of centrally acting synthetic opioid analgesic, and our market opportunity for this product candidate may be limited by the lack of patent protection for the active ingredient itself and other formulations that may be developed by competitors.***

The active ingredients in IV Tramadol have been generic in the United States for a number of years. While we believe that the patent estate covering IV Tramadol (including but not limited to U.S. Patent Nos. 8,895,622; 9,561,195, 9,566,253 9,962,343, 10,406,122, 9,693,949, 9,968,551, 9,980,900, 10,022,321,10,537,521, 10,624,842, 10,751,277, 10,751,278, 10,751,279, 10,646,433, 10,729,644, 10,729,645, and 10,617,635) provides strong protection, our market opportunity would be limited if a generic manufacturer could obtain regulatory approval for another IV formulation of tramadol and commercialize it without infringing our patents.

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

Competitors may infringe our issued patents or other intellectual property. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time consuming. Any claims we assert against perceived infringers could provoke these parties to assert counterclaims against us alleging that we infringe their patents. In addition, in a patent infringement proceeding, a court may decide that a patent of ours is invalid or unenforceable, in whole or in part, construe the patent's claims narrowly or refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation proceeding could put one or more of our patents at risk of being invalidated, rendered unenforceable, or interpreted narrowly.

***We may become involved in other types of legal proceedings related to our intellectual property that could result in the invalidation or unenforceability of our patents and could be expensive and time consuming, regardless of the outcome.***

Any party can challenge the validity of our patents in post-grant proceedings at the PTAB, which include *inter partes* review and *post-grant* review proceedings. Although these proceedings are more limited, and therefore are often less expensive, than district court litigation, they can still require substantial resources. If the PTAB finds that our patents are unpatentable, we will be unable to enforce those patents against our competitors. Additionally, our competitors may bring other administrative challenges to our patents before the USPTO, including opposition, derivation, interference, *ex parte* reexamination, and *inter partes* reexamination proceedings. These proceedings may prevent our patent applications from issuing, or for patents that are already issued, an unsuccessful outcome will render the patent unenforceable.

***If we are sued for infringing intellectual property rights of third parties, it will be costly and time consuming, and an unfavorable outcome in any litigation would harm our business.***

Our ability to develop, manufacture, market and potentially sell IV Tramadol or any other product candidates that we may license or acquire depends upon our ability to avoid infringing the proprietary rights of third parties. Numerous U.S. and foreign patents and pending patent applications, which are owned by third parties, exist in the general fields of pain treatment and cover the use of numerous compounds and formulations in our targeted markets. Because of the uncertainty inherent in any patent or other litigation involving proprietary rights, we and our licensors may not be successful in defending intellectual property claims by third parties, which could have a material adverse effect on our results of operations. Regardless of the outcome of any litigation, defending the litigation may be expensive, time-consuming and distracting to management. In addition, because patent applications can take many years to issue, there may be currently pending applications, unknown to us, which may later result in issued patents that IV Tramadol may infringe. There could also be existing patents of which we are not aware that IV Tramadol may inadvertently infringe.

There is a substantial amount of litigation involving patent and other intellectual property rights in the biotechnology and biopharmaceutical industries generally. If a third party claims that we infringe on their patents or misappropriated their technology, we could face a number of issues, including:

- infringement and other intellectual property claims which, with or without merit, can be expensive and time consuming to litigate and can divert management's attention from our core business;
- substantial damages for past infringement which we may have to pay if a court decides that our product infringes on a competitor's patent;
- a court prohibiting us from selling or licensing our product unless the patent holder licenses the patent to us, which it would not be required to do;
- if a license is available from a patent holder, we may have to pay substantial royalties or grant cross licenses to our patents; and
- redesigning our processes so they do not infringe, which may not be possible or could require substantial funds and time.

***We may need to license certain intellectual property from third parties, and such licenses may not be available or may not be available on commercially reasonable terms.***

A third party may hold intellectual property, including patent rights that are important or necessary to the development and potential commercialization of our product. It may be necessary for us to use the patented or proprietary technology of third parties to potentially commercialize our product, in which case we would be required to obtain a license from these third parties on commercially reasonable terms, or our business could be harmed, possibly materially.

***If we fail to comply with our obligations in our intellectual property licenses and funding arrangements with third parties, we could lose rights that are important to our business.***

We are currently party to a license agreement for IV Tramadol. In the future, we may become party to licenses that are important for product development and potential commercialization. If we fail to comply with our obligations under current or future license and funding agreements, our counterparties may have the right to terminate these agreements, in which event we might not be able to develop, manufacture or market any product or utilize any technology that is covered by these agreements or may face other penalties under the agreements. Such an occurrence could materially and adversely affect the value of a product candidate being developed under any such agreement or could restrict our drug discovery activities. Termination of these agreements or reduction or elimination of our rights under these agreements may result in our having to negotiate new or reinstated agreements with less favorable terms, or cause us to lose our rights under these agreements, including our rights to important intellectual property or technology.

***To the extent we operate in foreign jurisdictions, we may be exposed to increased risk associated with the potential theft of technology and intellectual property.***

Our U.S. patents can be enforced against those who make, use, offer to sell, or sell our licensed patented inventions within the U.S., or against those who import our licensed patented inventions within the U.S. We may depend on foreign intellectual property rights to prevent competitors from manufacturing and selling our products outside of the U.S. without our authorization. Foreign laws and regulations may not protect our patent rights and trade secret rights to the same extent as U.S. law. It is also possible that we may be required to compromise protections or waive rights in order to conduct business in a foreign jurisdiction. Such restrictions may limit our ability to profitably compete in those markets.

***We may be subject to claims that our employees have wrongfully used or disclosed alleged trade secrets of their former employers.***

As is common in the biotechnology and pharmaceutical industry, we employ individuals who were previously employed at other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although no claims against us are currently pending, we may be subject to claims that these employees or we have inadvertently or otherwise used or disclosed trade secrets or other proprietary information of their former employers. Litigation may be necessary to defend against these claims. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to management.

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

In addition to seeking patent protection for our product candidate or future product candidates, we also rely on trade secrets, including unpatented know-how, technology and other proprietary information, to maintain our competitive position, particularly where we do not believe patent protection is appropriate or obtainable. However, trade secrets are difficult to protect. We limit disclosure of such trade secrets where possible but we also seek to protect these trade secrets, in part, by entering into non-disclosure and confidentiality agreements with parties who do have access to them, such as our employees, our licensors, corporate collaborators, outside scientific collaborators, contract manufacturers, consultants, advisors and other third parties. We also enter into confidentiality and invention or patent assignment agreements with our employees and consultants. Despite these efforts, any of these parties may breach the agreements and may unintentionally or willfully disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets. Moreover, if any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent them, or those to whom they communicate it, from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor, our competitive position would be harmed.

General Risk Factors

***Our business and operations could be adversely affected by the effects of health epidemics, including the ongoing COVID-19 pandemic.***

Any potential future clinical trials may experience delays in patient enrolment, potentially due to prioritization of hospital resources toward the COVID-19 pandemic, or concerns among patients about participating in clinical trials during a public health emergency. The COVID-19 pandemic is affecting the operations of government entities, such as the FDA, as well as contract research organizations, third-party manufacturers, and other third-parties upon whom we rely. As a result of “shelter-in-place” orders, quarantines or similar orders or restrictions to control the spread of COVID-19, many companies, including our own, have implemented work-from-home policies for their employees. The effects of these stay at home orders and work-from-home policies may be negatively impacting productivity, resulting in delays in our timelines. The extent of the impact on our operations depends in part on the time these restrictions remain in place, and whether restrictions are reinstated as a result of a rising surge in COVID-19 cases. These and similar disruptions in our operations could negatively impact our business, operating results and financial condition.

The spread of COVID-19 has also led to disruption and volatility in the global capital markets, which increases the cost of, and adversely impacts access to, capital and increases economic uncertainty. To the extent the COVID-19 pandemic adversely affects our business, financial results and value of our common stock, it may also affect our ability to access capital and obtain financing, which could in the future negatively affect our liquidity.

The global pandemic of COVID-19 continues to evolve rapidly, and the ultimate impact of the COVID-19 pandemic or a similar health epidemic is highly uncertain and subject to change. We do not yet know the full impact of potential delays or effects on our business, our ability to access the capital markets, or supply chains or on the global economy as a whole. However, these effects could have a material impact on our operations, and we will continue to monitor the COVID-19 situation closely.

***Our results of operations and liquidity needs could be materially negatively affected by market fluctuations and economic downturn.***

Our results of operations could be materially negatively affected by economic conditions generally, both in the United States and elsewhere around the world. Continuing concerns over inflation, energy costs, geopolitical issues, the availability and cost of credit, the U.S. mortgage market and residential real estate market in the United States have contributed to increased volatility and diminished expectations for the economy and the markets going forward. These factors, combined with volatile oil prices, declining business and consumer confidence and increased unemployment, have precipitated an economic recession and fears of a possible depression. Domestic and international equity markets continue to experience heightened volatility and turmoil. These events and the continuing market upheavals may have an adverse effect on us. In the event of a continuing market downturn, our results of operations could be adversely affected by those factors in many ways, including making it more difficult for us to raise funds if necessary, and our stock price may further decline.

***Our business and operations would suffer in the event of system failures.***

Despite the implementation of security measures, our internal computer systems are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. Any system failure, accident or security breach that causes interruptions in our operations could result in a material disruption of our drug development programs. For example, the loss of clinical trial data from completed clinical trials for IV Tramadol could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach results in a loss or damage to our data or applications, or inappropriate disclosure of confidential or proprietary information, we may incur liability and the further development of our product candidate may be delayed.

***The occurrence of a catastrophic disaster could damage our facilities beyond insurance limits or we could lose key data which could cause us to curtail or cease operations.***

We are vulnerable to damage and/or loss of vital data from natural disasters, such as earthquakes, tornadoes, power loss, fire, health epidemics and pandemics, floods and similar events, as well as from accidental loss or destruction. If any disaster were to occur, our ability to operate our businesses could be seriously impaired. We have property, liability and business interruption insurance that may not be adequate to cover losses resulting from disasters or other similar significant business interruptions, and we do not plan to purchase additional insurance to cover such losses due to the cost of obtaining such coverage. Any significant losses that are not recoverable under our insurance policies could seriously impair our business, financial condition and prospects. Any of the aforementioned circumstances, including without limitation the emerging COVID-19 virus, may also impede our employees' and consultants' abilities to provide services in-person and/or in a timely manner; hinder our ability to raise funds to finance our operations on favorable terms or at all; and trigger effectiveness of "force majeure" clauses under agreements with respect to which we receive goods and services, or under which we are obligated to achieve developmental milestones on certain timeframes. Disputes with third parties over the applicability of such "force majeure" clauses, or the enforceability of developmental milestones and related extension mechanisms in light of such business interruptions, may arise and may become expensive and time-consuming.

***We may become involved in securities class action litigation that could divert management's attention and harm our business.***

The stock markets have from time to time experienced significant price and volume fluctuations that have affected the market prices for the common stock of biotechnology and pharmaceutical companies. These broad market fluctuations may cause the market price of our stock to decline. In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities. This risk is especially relevant for us because biotechnology and biopharmaceutical companies have experienced significant stock price volatility in recent years and due to the significant stock price decline we experienced following the announcement of the CRL. We may become involved in this type of litigation in the future. Litigation often is expensive and diverts management's attention and resources, which could adversely affect our business.

**Item 1B. Unresolved Staff Comments**

None.

**Item 2. Properties**

Our corporate and executive office is located at 1140 Avenue of the Americas, Floor 9, New York, NY 10036. We are not currently under a lease agreement at 1140 Avenue of the Americas. We believe that our existing facilities are adequate to meet our current requirements. We do not own any real property.

**Item 3. Legal Proceedings**

We are not involved in any litigation that we believe could have a material adverse effect on our financial position or results of operations.

**Item 4. Mine Safety Disclosures**

Not applicable

PART II

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

Market Information

Our common stock is listed on the Nasdaq Capital Market and trades under the symbol “ATXI”.

Holders

As of March 21, 2022, there were approximately 21.7 million shares of common stock outstanding. The number of record holders of our common stock as of March 21, 2022 was 38.

Dividends

We have never paid or declared any cash dividends on our common stock, and we do not anticipate paying any cash dividends on our common stock in the foreseeable future. We intend to retain all available funds and any future earnings to fund the development and expansion of our business. Any future determination to pay dividends will be at the discretion of our board of directors and will depend upon a number of factors, including our results of operations, financial condition, future prospects, contractual restrictions, restrictions imposed by applicable law and other factors our board of directors deems relevant.

Equity Compensation Plans

On December 17, 2021, we filed a registration statement on Form S-8 under the Securities Act registering the common stock issued, issuable or reserved for issuance under our 2015 Incentive Plan, as amended (“2015 Plan”). The registration statement became effective immediately upon filing, and shares covered by the registration statement are eligible for sale in the public markets, subject to grant of the underlying awards, vesting provisions and Rule 144 limitations applicable to our affiliates.

Securities Authorized for Issuance Under Equity Compensation Plans

The following table provides information as of December 31, 2021, regarding the securities authorized for issuance under our 2015 Plan.

Equity Compensation Plan Information

Plan Category	Number of securities to be issued upon exercise of outstanding options	Weighted-average exercise price of outstanding options	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column 1)
Equity compensation plans approved by security holders	4,000,000	\$	
Equity compensation plans not approved by security holders	—	—	—
Total	4,000,000	\$	

Recent Sales of Unregistered Securities

Not applicable.

Description of Registrant’s Securities to be Registered

Not applicable.

**Purchases of Equity Securities by the Issuer and Affiliated Purchasers**

Not applicable.

**Item 6. Reserved**

**Item 7. Management's Discussion and Analysis of the Results of Operations**

**Forward-Looking Statements**

*Statements in the following discussion and throughout this report that are not historical in nature are "forward-looking statements." You can identify forward-looking statements by the use of words such as "expect," "anticipate," "estimate," "may," "will," "should," "intend," "believe," and similar expressions. Although we believe the expectations reflected in these forward-looking statements are reasonable, such statements are inherently subject to risk and we can give no assurances that our expectations will prove to be correct. Actual results could differ from those described in this report because of numerous factors, many of which are beyond our control. These factors include, without limitation, those described under Item 1A "Risk Factors." We undertake no obligation to update these forward-looking statements to reflect events or circumstances after the date of this report or to reflect actual outcomes. Please see "Forward-Looking Statements" at the beginning of this Form 10-K.*

*The following discussion of our financial condition and results of operations should be read in conjunction with our financial statements and the related notes thereto and other financial information appearing elsewhere in this Form 10-K. We undertake no obligation to update any forward-looking statements in the discussion of our financial condition and results of operations to reflect events or circumstances after the date of this report or to reflect actual outcomes.*

**Overview**

We are a specialty pharmaceutical company that seeks to develop and commercialize our product principally for use in the acute/intensive care hospital setting. Our current product candidate is intravenous ("IV") Tramadol, for the treatment of post-operative acute pain. Under the terms of certain agreements described herein, we have an exclusive license to develop and commercialize IV Tramadol in the United States. In 2016, we completed a pharmacokinetic study for IV Tramadol in healthy volunteers as well as an end of phase 2 meeting with the U.S. Food and Drug Administration ("FDA"). In the third quarter of 2017, we initiated a Phase 3 development program of IV Tramadol for the management of post-operative pain. In December 2019, we submitted a New Drug Application ("NDA") for IV Tramadol and received a Complete Response Letter (the "First CRL") from the FDA in October 2020. In February 2021, we resubmitted the NDA for IV Tramadol. The FDA assigned a Prescription Drug User Fee Act ("PDUFA") goal date of April 12, 2021 for the resubmitted NDA for IV Tramadol. On June 14, 2021, we announced that we had received a second Complete Response Letter (the "Second CRL") from the FDA regarding our NDA for IV Tramadol. We continue to pursue regulatory approval for IV Tramadol and had a Type A meeting with the FDA in July 2021. We submitted a formal dispute resolution request ("FDRR") with the Office of Neuroscience of the FDA on July 27, 2021. On August 26, 2021, we received an Appeal Denied Letter from the Office of Neuroscience of the FDA in response to the FDRR submitted on July 27, 2021. On August 31, 2021, we submitted a FDRR with the Office of New Drugs ("OND") of the FDA. On October 21, 2021, we received a written response from the OND of the FDA stating that the OND needs additional input from an Advisory Committee in order to reach a decision on the FDRR. On February 15, 2022, we had an Advisory Committee meeting with the FDA. In the final part of the public meeting, the Advisory Committee voted yes or no on the following question: "Has the Applicant submitted adequate information to support the position that the benefits of their product outweigh the risks for the management of acute pain severe enough to require an opioid analgesic in an inpatient setting?" The results were 8 yes votes and 14 no votes. To date, we have not received approval for the sale of our product candidate in any market and, therefore, have not generated any sales revenue from our product candidate.

**Recent Developments**

On November 12, 2018, we, InvaGen Pharmaceuticals Inc. ("InvaGen"), and Madison Pharmaceuticals, Inc. entered into a Stock Purchase and Merger Agreement ("SPMA"), pursuant to which we agreed to our sale in a two-stage transaction. In the first stage, InvaGen agreed to purchase, for \$35 million, common shares representing 33.3% of the fully diluted capitalization of our stock. In the second stage, InvaGen would acquire the remaining issued and outstanding of our capital stock for approximately \$180 million in a reverse subsidiary merger transaction (the "Merger Transaction"). The SPMA was approved by a majority of our stockholders, including a majority of our non-affiliated stockholders, at our special shareholder meeting on February 6, 2019. On February 8, 2019, InvaGen



acquired 5,833,333 shares of our common stock at \$6.00 per share (the “Stock Purchase Transaction”) for net proceeds of \$31.5 million after deducting commission fees and other offering costs, representing a 33.3% stake in our capital stock on a fully diluted basis. On November 1, 2021, we terminated the SPMA.

In November 2021, through an underwritten public offering, we sold 2,238,805 shares of our common stock at a price of \$1.34 per share resulting in net proceeds of \$2.6 million. In addition, in December 2021, through an underwritten public offering, we sold 1,910,100 shares of our common stock at a price of \$1.07 per share resulting in net proceeds of \$1.8 million.

On January 5, 2022, Mr. Joseph Vazzano notified us that he was resigning from his role as our Chief Financial Officer to pursue other opportunities, effective January 14, 2022. On January 7, 2022, the Board of Directors appointed Dr. Lucy Lu, M.D., our President and Chief Executive Officer, as our interim Chief Financial Officer and Principal Financial Officer.

### **Background**

On June 26, 2017, we completed an initial public offering (“IPO”) of our common stock, resulting in net proceeds of approximately \$34.2 million after deducting underwriting discounts, and other offering costs.

We used the proceeds from our IPO to initiate our first Phase 3 trial of IV Tramadol in patients with moderate-to-severe pain following bunionectomy, which had its first patient dosed in September 2017. In May 2018, we announced the study met its primary endpoint and all key secondary endpoints.

In December 2018, we initiated the second Phase 3 trial in patients with moderate-to-severe pain following abdominoplasty upon successful completion of the bunionectomy study. In June 2019, we announced the study met its primary endpoint and all key secondary endpoints.

In December 2017, we initiated an open-label safety study, which was completed during the second quarter of 2019. The results showed that IV Tramadol is well-tolerated with a side effect profile consistent with known pharmacology.

In December 2019, we submitted an NDA pursuant to Section 505(b)(2) of the Federal Food, Drug and Cosmetic Act. In February 2020, the FDA accepted our NDA submission and set a PDUFA goal date of October 10, 2020. On October 12, 2020, we announced that we had received the First CRL from the FDA regarding our NDA. In November 2020, we had a Type A Meeting with the FDA to discuss issues raised in the First CRL. On February 12, 2021, we resubmitted the NDA to the FDA for IV Tramadol. The NDA resubmission followed the receipt of official minutes from a Type A meeting with the FDA, which was conducted following receipt of the First CRL. The NDA resubmission included revised language relating to the proposed product label and a report relating to terminal sterilization validation. The FDA assigned a PDUFA goal date of April 12, 2021 for the resubmitted NDA for IV Tramadol. On June 14, 2021, we announced that we had received the Second CRL from the FDA regarding our NDA for IV Tramadol. We continue to pursue regulatory approval for IV Tramadol and in connection therewith, had a Type A meeting with the FDA in July 2021. We submitted a FDRR with the Office of Neuroscience of the FDA on July 27, 2021. On August 26, 2021, we received an Appeal Denied Letter from the Office of Neuroscience of the FDA in response to the FDRR submitted on July 27, 2021. On August 31, 2021, we submitted a FDRR with the OND of the FDA. On October 21, 2021, we received a written response from the OND of the FDA stating that the OND needs additional input from an Advisory Committee in order to reach a decision on the FDRR. On February 15, 2022, we had an Advisory Committee meeting with the FDA. In the final part of the public meeting, the Advisory Committee voted yes or no on the following question: “Has the Applicant submitted adequate information to support the position that the benefits of their product outweigh the risks for the management of acute pain severe enough to require an opioid analgesic in an inpatient setting?” The results were 8 yes votes and 14 no votes. On March 18, 2022, we received an Appeal Denied Letter from the OND in response to the FDRR. We are evaluating next steps with regard to IV Tramadol.

On November 12, 2018, we, InvaGen, and Madison Pharmaceuticals, Inc. entered into the SPMA, in which we agreed to our sale in a two-stage transaction. In the first stage, InvaGen agreed to purchase, for \$35 million, common shares representing 33.3% of our fully diluted capital stock. In the second stage, InvaGen would acquire our remaining issued and outstanding capital stock for approximately \$180 million pursuant to the Merger Transaction. The SPMA was approved by a majority of our stockholders, including a majority of our non-affiliated stockholders, at our special shareholder meeting on February 6, 2019. On February 8, 2019, InvaGen acquired 5,833,333 shares of our common stock at \$6.00 per share (the “Stock Purchase Transaction”) for net proceeds of \$31.5 million after deducting commission fees and other offering costs, representing a 33.3% stake in our capital stock on a fully diluted basis.

Consummation of the Merger Transaction was conditioned upon, among other things, FDA approval of IV Tramadol, its labeling and scheduling, and the absence of certain other restrictions in effect with respect to IV Tramadol. Pursuant to the SPMA, if FDA approval of IV Tramadol was not obtained on or before April 30, 2021, InvaGen would not be subject to the mandatory closing obligations set forth in the SPMA with respect to the Merger Transaction (but would instead retain an option to complete the Merger Transaction up until such time as the SPMA was terminated). Pursuant to the SPMA, we could choose to terminate the SPMA after October 31, 2021, if FDA approval of IV Tramadol had not occurred by such time. On November 1, 2021, we terminated the SPMA.

Even though the SPMA has been terminated, InvaGen retains certain rights pursuant to the Stockholders Agreement, entered into on November 12, 2018 between us, InvaGen and Fortress, and other agreements entered into in connection therewith on such date. These rights exist as long as InvaGen maintains at least 75% of the common shares acquired in the Stock Purchase Transaction and include among other things, the right to restrict us from certain equity issuances and changes to our capital stock without obtaining InvaGen's prior written consent.

Over the past year, we have communicated with InvaGen relating to InvaGen's assertions that Material Adverse Effects (as defined in the SPMA) have occurred due to the impact of the COVID-19 pandemic on potential commercialization and projected sales of IV Tramadol. Additionally, in connection with the resubmission of our NDA in February 2021, InvaGen communicated to us that it believes the proposed label for IV Tramadol would also constitute a Material Adverse Effect (as defined in the SPMA) on the purported basis that the proposed label under certain circumstances would make the product commercially unviable. Even though the SPMA has been terminated, it is still possible for InvaGen to pursue monetary claims against us and/or Fortress based on the foregoing or other potential causes of action.

Our net loss for the years ended December 31, 2021 and 2020 was approximately \$3.7 million and \$5.2 million, respectively. As of December 31, 2021, we had an accumulated deficit of approximately \$77.0 million. Substantially all our net losses resulted from costs incurred in connection with our research and development program of IV Tramadol and from general and administrative costs associated with our operations.

We expect to continue to incur research and development costs and increased general and administration related costs and incur operating losses for at least the next several years as we develop and seek regulatory approval for IV Tramadol in the U.S.

We may need to obtain additional capital through the sale of debt or equity financings or other arrangements to fund our operations, research and development activity or regulatory approval activity; however, there can be no assurance that we will be able to raise needed capital under acceptable terms, if at all. The sale of additional equity may dilute existing stockholders and newly issued shares may contain senior rights and preferences compared to currently outstanding shares of common stock. Issued debt securities may contain covenants and limit our ability to pay dividends or make other distributions to stockholders. If we are unable to obtain such additional financing, future operations would need to be scaled back or discontinued.

We are a majority controlled subsidiary of Fortress. For related party transactions, see Note 4.

Avenue Therapeutics, Inc. was incorporated in Delaware on February 9, 2015. Our executive offices are located at 1140 Avenue of the Americas, Floor 9, New York, NY 10036. Our telephone number is (781) 652-4500, and our email address is [info@avenuetx.com](mailto:info@avenuetx.com).

#### **Critical Accounting Policies and Use of Estimates**

Our discussion and analysis of our financial condition and results of operations are based on our financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States (U.S. GAAP). The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses and the disclosure of contingent assets and liabilities in our financial statements. On an ongoing basis, we evaluate our estimates and judgments, including those related to accrued expenses and stock-based compensation. We base our estimates on historical experience, known trends and events and various other factors that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

#### **Research and Development**

Research and development costs are expensed as incurred. Advance payments for goods and services that will be used in future research and development activities are expensed when the activity has been performed or when the goods have been received rather

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than when the payment is made. Upfront and milestone payments due to third parties that perform research and development services on our behalf will be expensed as services are rendered or when the milestone is achieved. Costs incurred in obtaining technology licenses are charged to research and development expense if the technology licensed has not reached technological feasibility and has no alternative future use.

Research and development costs primarily consist of personnel related expenses, including salaries, benefits, travel, and other related expenses, stock-based compensation, payments made to third parties for license and milestone costs related to in-licensed products and technology, payments made to third party contract research organizations for preclinical and clinical studies, investigative sites for clinical trials, consultants, the cost of acquiring and manufacturing clinical trial materials, costs associated with regulatory filings and patents, laboratory costs and other supplies.

Costs incurred in obtaining technology licenses are charged to research and development expense if the technology licensed has not reached commercial feasibility and has no alternative future use. The licenses purchased by us require substantial completion of research and development, regulatory and marketing approval efforts in order to reach commercial feasibility and has no alternative future use. Accordingly, the total purchase price for the licenses acquired are reflected as research and development — licenses acquired on our Statement of Operations.

**Stock-Based Compensation**

We expense stock-based compensation to employees, consultants and board members over the requisite service period based on the estimated grant-date fair value of the awards. Stock-based awards with graded-vesting schedules are recognized on a straight-line basis over the requisite service period for each separately vesting portion of the award.

The assumptions used in calculating the fair value of stock-based awards represent management's best estimates and involve inherent uncertainties and the application of management's judgment.

**Income Taxes**

No income tax expense or benefit was recognized in the accompanying financial statements. Our deferred tax assets are comprised primarily of net operating loss carryforwards. We maintain a full valuation allowance on our deferred tax assets since we have not yet achieved sustained profitable operations. As a result, we have not recorded any income tax benefit since our inception.

**Results of Operations****Comparison of the Years Ended December 31, 2021 and 2020**

(\$ in thousands)	For The Years Ended		Change	
	December 31,		\$	%
	2021	2020		
Operating expenses:				
Research and development	\$ 1,254	\$ 2,866	\$ (1,612)	(56)%
General and administrative	2,484	2,347	137	6%
Loss from operations	(3,738)	(5,213)	1,475	(28)%
Interest income	(7)	(62)	(55)	(89)%
<b>Net Loss</b>	<b>\$ (3,731)</b>	<b>\$ (5,151)</b>	<b>\$ 1,420</b>	<b>(28)%</b>

**Research and Development Expenses**

For the years ended December 31, 2021 and 2020, research and development expenses were \$1.3 million and \$2.9 million, respectively. The \$1.6 million decrease primarily reflects decreases of \$0.9 million due to the commercial validation batches and NDA review work done in 2020 with our supplier, \$0.6 million in consulting and NDA review activities associated with advisory committee preparation and NDA information requests in 2020 and \$0.1 million in non-cash stock compensation costs.

We expect our research and development activities to continue as we develop and seek regulatory approval for IV Tramadol, reflecting costs associated with the following:

- employee-related expenses;
- license fees and milestone payments related to in-licensed product and technology;
- expenses incurred under agreements with contract research organizations, investigative sites and consultants that conduct our clinical trials;
- the cost of acquiring and manufacturing clinical trial materials; and
- costs associated with non-clinical activities, and regulatory approvals.

#### **General and Administrative Expenses**

General and administrative expenses consist principally of professional fees for legal and consulting services, market research, personnel-related costs, public reporting company related costs and other general operating expenses not otherwise included in research and development expenses. We expect our general and administrative costs to continue as we seek potential regulatory approval and potential commercialization of our product candidate.

For the years ended December 31, 2021 and 2020, general and administrative expenses were \$2.5 million and \$2.4 million, respectively. The \$0.1 million increase primarily reflects increases of \$0.2 million in legal expenses related to the SPMA and FDRR and \$0.2 million in personnel expenses partially offset by a decrease of \$0.2 million in non-cash stock compensation costs.

#### **Interest Income**

Interest income was \$7,000 and \$62,000 for the years ended December 31, 2021 and 2020, respectively. The decrease in interest income was due to the cash used in operations.

#### **Liquidity and Capital Resources**

We have incurred substantial operating losses since our inception and expect to continue to incur significant operating losses for the foreseeable future and may never become profitable. As of December 31, 2021, we had an accumulated deficit of \$77.0 million. We have used the funds from our IPO, from the InvaGen share purchase and from our public offerings in 2021 to finance our operations. We will continue to use these funds primarily for general corporate purposes, which may include financing our growth and developing our product candidate.

We believe that our cash and cash equivalents are only sufficient to fund our operating expenses into the second quarter of 2022. We need to secure additional funds through equity or debt offerings, or other potential sources. Furthermore, under the Stockholder's Agreement, any equity funding must be approved by InvaGen. We cannot be certain that additional funding will be available on acceptable terms, or at all. These factors individually and collectively raise substantial doubt about our ability to continue as a going concern.

In addition to the foregoing, based on current assessments, we do not expect any material impact on our regulatory timeline and our liquidity due to the worldwide spread of the COVID-19 virus. However, we are continuing to assess the effect on our operations by monitoring the spread of COVID-19 and the actions implemented to combat the virus throughout the world.

#### **Cash Flows for the Years Ended December 31, 2021 and 2020**

(\$ in thousands)	For The Years Ended December 31,	
	2021	2020
Total cash and cash equivalents (used in)/provided by:		
Operating activities	\$ (3,750)	\$ (4,613)
Investing activities	—	(1,000)
Financing activities	4,381	—
Net increase/(decrease) in cash and cash equivalents	\$ 631	\$ (5,613)

*Operating Activities*

Net cash used in operating activities was approximately \$3.8 million for the year ended December 31, 2021, primarily comprised of our \$3.7 million net loss and decrease in operating assets and liabilities of \$0.5 million, partially offset by \$0.4 million in share based compensation.

Net cash used in operating activities was approximately \$4.6 million for the year ended December 31, 2020, primarily comprised of our \$5.2 million net loss and decrease in operating assets and liabilities of \$0.2 million, partially offset by \$0.7 million in share based compensation.

*Investing Activities*

Net cash used in investing activities for the year ended December 31, 2020 was \$1.0 million and consisted of the milestone payment paid to our licensor pursuant to our NDA submission.

*Financing Activities*

Net cash provided by financing activities for the year ended December 31, 2021 was \$4.4 million which was from the proceeds of our issuance of shares pursuant to our two underwritten public offerings in November and December 2021.

**Recently Adopted Accounting Standards**

See Note 2 to the financial statements for a full description of recent accounting pronouncements including the respective expected dates of adoption and expected effects on results of operations and financial condition.

**Item 7A. Quantitative and Qualitative Disclosures about Market Risk.**

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

**Item 8. Financial Statements and Supplementary Data.**

The information required by this Item is set forth in the financial statements and notes thereto beginning at page F-1 of this Annual Report on Form 10-K.

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

Not applicable.

**Item 9A. Controls and Procedures.**

*Evaluation of Disclosure Controls and Procedures.* As of December 31, 2021, management carried out, under the supervision and with the participation of our principal executive officer and principal financial officer, an evaluation of the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act). Our disclosure controls and procedures are designed to provide reasonable assurance that information we are required to disclose in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in applicable rules and forms. Based upon that evaluation, our principal executive officer and principal financial officer concluded that, as of December 31, 2021, our disclosure controls and procedures were effective.

*Management's Report on Internal Control over Financial Reporting.* Our management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rule 13a-15(f) or Rule 15d-15(f) under the Exchange Act). Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2021. In making this assessment, our management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission, known as COSO, in Internal Control-Integrated Framework (2013). Our management has concluded that, as of December 31, 2021, our internal control over financial reporting was effective based on these criteria.

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*Changes in Internal Control Over Financial Reporting.* There were no changes in our internal control over financial reporting during the most recent fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

*Limitations on the Effectiveness of Controls.* Our management, including our principal executive officer and principal financial officer, does not expect that our disclosure controls and procedures or our internal control over financial reporting will prevent all errors and all fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within our company have been detected.

**Item 9B. Other Information**

None.

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

Not Applicable.

**PART III**

**Item 10. Directors, Executive Officers and Corporate Governance**

**OUR DIRECTORS**

The following biographies set forth the names of our current directors and director nominees, their ages, the year in which they first became directors, their positions with us, their principal occupations and employers, any other directorships held by them during the past five years in companies that are subject to the reporting requirements of the Securities Exchange Act of 1934 (the “Exchange Act”), or any company registered as an investment company under the Investment Company Act of 1940, as well as additional information, all of which we believe sets forth each director nominee’s qualifications to serve on the Board. There is no family relationship between and among any of our executive officers or directors. On November 12, 2018, we entered into a Stock Purchase and Merger Agreement (the “SPMA”) with InvaGen and Madison Pharmaceuticals Inc., pursuant to which InvaGen purchased common stock representing 33.3% of the Company for \$35 million. On November 1, 2021, we terminated the SPMA. In connection with the SPMA, we also entered into a Stockholders Agreement with InvaGen which survives the termination of the SPMA. Pursuant to the Stockholders Agreement, among other things, InvaGen obtained the right to nominate three directors to the Company’s seven member Board. In February 2019, InvaGen exercised its right to nominate a director to the Board with Dr. Gogtay whose biography is described below. In August 2019, InvaGen exercised its right to nominate a second director, Ms. Ingram whose biography is described below. Additionally, in April 2021, InvaGen exercised its right to nominate a third director, Mr. Oltmans whose biography is described below. Even though the Company terminated the SPMA on November 1, 2021, InvaGen still retains its right to have three members on the Company’s Board pursuant to the Stockholders Agreement Except as described herein, there are no arrangements or understandings between any of our executive officers or directors and any other person pursuant to which any of them are elected as an officer or director.

<u>Name</u>	<u>Age</u>	<u>Position</u>	<u>Director Since</u>
Lindsay A. Rosenwald, M.D.	66	Executive Chairman of the Board of Directors	2015
Lucy Lu, M.D.	47	President, Chief Executive Officer, Interim Chief Financial Officer, and Director	2015
Neil Herskowitz	65	Director	2015
Jay Kranzler, M.D., PhD	63	Director	2017
Elizabeth Garrett Ingram	56	Director	2019
Jaideep Gogtay, M.D.	55	Director	2019
Curtis Oltmans	58	Director	2021

***Lindsay A. Rosenwald, M.D. — Executive Chairman of the Board of Directors***

Dr. Rosenwald, 66, has served as our Executive Chairman of the Board of Directors since inception. Dr. Rosenwald also serves as Chairman, President and Chief Executive Officer of Fortress Biotech, Inc., Chairman of Journey Medical Corporation, a director of Mustang Bio, Inc., and a director of Checkpoint Therapeutics, Inc. Since November 2008, Dr. Rosenwald has served as Co-Portfolio Manager and Partner of Opus Point Partners Management, LLC (“Opus Point”), an asset management firm in the life sciences industry, which he joined in 2009. Prior to that, from 1991 to 2008, he served as the Chairman of Paramount BioCapital, Inc. The Board believes that because Dr. Rosenwald, over the last 23 years, has acted as a biotechnology entrepreneur and has been involved in the founding and recapitalization of numerous public and private biotechnology and life sciences companies, he is exceptionally qualified to serve on our Board as Executive Chairman. Dr. Rosenwald received his B.S. in finance from Pennsylvania State University and his M.D. from Temple University School of Medicine.

***Lucy Lu, M.D. — President, Chief Executive Officer, Interim Chief Financial Officer and Director***

Dr. Lu, 47, has been our President and Chief Executive Officer since inception. She became our Interim Chief Financial Officer in January 2022. From February 2012 to June 2017, Dr. Lu was the Executive Vice President and Chief Financial Officer of Fortress Biotech, Inc. Prior to working in the biotech industry, Dr. Lu had 10 years of experience in healthcare-related equity research and investment banking. Additionally, Dr. Lu was a member of the Board of Directors of Veru, Inc. from 2016 to 2018, and has served as a member of the Board of Directors of Iventia Healthcare Limited since 2018. From February 2007 through January 2012, Dr. Lu was a senior biotechnology equity analyst with Citigroup Investment Research. From 2004 until joining Citigroup, she was with First Albany Capital, serving as Vice President from April 2004 until becoming a Principal of the firm in February 2006. Dr. Lu holds an M.D. degree from the New York University School of Medicine and an M.B.A. from the Leonard N. Stern School of Business at New York University. Dr. Lu obtained a B.A. from the University of Tennessee’s College of Arts and Science. We believe that Dr. Lu is qualified to serve on our Board due to her leadership and management experience, her understanding of biopharmaceutical companies, and her extensive knowledge of our business and industry.

***Neil Herskowitz***

Mr. Herskowitz, 65, joined our Board of Directors in August 2015 and has served as the Chairman of our Audit Committee since September 2016. Mr. Herskowitz has served as the managing member of the ReGen Group of companies, located in New York, since 1998, which include ReGen Capital Investments LLC and Riverside Claims Investments LLC. He has also served as the President of its affiliate, Riverside Claims LLC, since June 2004. Additionally, Mr. Herskowitz served as a Board member of National Holdings, Inc. from 2016 to 2019, and has served as a Board member of Mustang Bio, Inc., Journey Medical Corporation and Checkpoint Therapeutics, Inc. since 2015. Mr. Herskowitz received a B.B.A. in Finance from Bernard M. Baruch College in 1978. The Board believes, based on Mr. Herskowitz’s over 15 years of Audit Committee and Board experience in the biotech industry, that Mr. Herskowitz is uniquely qualified to serve as a member of our Board and as the Chairman of our Audit Committee.

***Jay Kranzler, M.D., PhD***

Dr. Kranzler, 63, joined our Board of Directors in February 2017. Dr. Kranzler has been a Founder, Chief Executive Officer, Board Member, and Advisor to leading life science companies for over 30 years. He is currently acting as Executive Chairman of Perception Neuroscience, a company that he co-founded, a regenerative medicine company, and is a Board Member of Pastorus and ImmunoBrain Checkpoint, all companies focused on developing therapeutics for psychiatric or neurological disorders. Dr. Kranzler started his career at McKinsey & Company where he helped establish the Firm’s pharmaceutical practice. He served as CEO of Cytel Corporation, a company focused on the development of immunomodulatory drugs. Following Cytel, Dr. Kranzler became the CEO of Cypress Bioscience, where he was credited for the development of Savella™ (milnacipran) for the treatment of fibromyalgia. Dr. Kranzler was also Vice President, Head of Worldwide External R&D Innovation and Strategic Investments at Pfizer. During his career, Dr. Kranzler has developed drugs, medical devices, as well as diagnostics, and is the inventor on over 30 patents. Dr. Kranzler graduated from Yale University School of Medicine with MD and PhD degrees with a focus in psychopharmacology. We believe that Dr. Kranzler is qualified to serve on our Board due to his management experience, his service as an executive of biopharmaceutical companies and his knowledge of our business and industry.

***Jaideep Gogtay, M.D.***

Dr. Gogtay, 55, joined our Board of Directors in February 2019. Since 1994, he has been working with Cipla Ltd., a leading global pharmaceutical company, and he currently serves as their Global Chief Medical Officer. He has closely been involved in the development and introduction of several drugs in various therapeutic fields. He was involved in setting up the Chest Research Foundation. This Foundation is now an independent research center dedicated to conducting research in the field of respiratory medicine. He has participated and spoken at several national and international forums, and has been actively involved in educational activities. Dr. Gogtay completed his medical graduation (M.B., B.S) from Grant Medical College and SirJJ Group of Hospitals in Mumbai. He then obtained his M.D. in Pharmacology from Seth GS Medical College and KEM Hospital. Based on Dr. Gogtay's pharmaceutical industry experience, the Board believes that Dr. Gogtay has the appropriate set of skills to serve as a member of the Board.

***Elizabeth Garrett Ingram***

Ms. Ingram, 56, has served as a member of our Board of Directors since August 2019. She currently serves as the Chief Commercial Officer at Cipla Therapeutics, Inc. Prior to her new role at Cipla Therapeutics, Inc., Ms. Ingram served as Chief Marketing Officer at MannKind Corporation, based in California. In addition, she has served in roles as Senior Vice President, Managed Markets at Dexcom and Vice President, Head of Market Access at Sanofi, where she had responsibility across four of the U.S. Business Units: Diabetes & Cardiovascular, General Medicines, Sanofi Genzyme Specialty Care, and Sanofi Pasteur from 2014 to 2016. Prior to joining Sanofi, she held the position of Vice President of Market Access Strategy at Bristol Myers Squibb, where she led the access, reimbursement, patient affordability and emerging customer strategy teams across the portfolio of diabetes, RA, cardiovascular, oncology, immunology, neuroscience and pipeline assets. Ms. Ingram holds a Bachelor of Science degree from East Carolina University, a Master's Degree in public health and community education from the University of South Carolina and has completed multiple post graduate studies at Wharton School of Business.

***Curtis Oltmans***

Mr. Oltmans, 58, joined our Board of Directors in April 2021 and is currently General Counsel of Fulcrum Therapeutics, Inc. and has over 25 years of experience in corporate law including senior management positions in legal departments at several leading pharmaceutical and biotechnology companies. Prior to Fulcrum Therapeutics, Inc, he served as Vice President, Head of Litigation at DaVita Kidney Care, Inc. where he led a 30-person team and was responsible for all litigation, workers' compensation and employee safety matters. Prior to DaVita Kidney Care, Mr. Oltmans was Executive Vice President, General Counsel and Corporate Secretary at Array BioPharma, Inc., where he oversaw all legal, corporate governance, patent and compliance matters. He previously served as Corporate Vice President and General Counsel for Novo Nordisk, Inc., North America. He was responsible for strategic support in areas including market access, government affairs, communications and product marketing. He has also served as Assistant General Counsel for Eli Lilly and Company after beginning his legal career supporting clients in pharmaceutical and medical device litigation matters. He served on the Board of Trustees for the Mercer County Boy's and Girl's Club. Mr. Oltmans received a B.A. in political science from the University of Nebraska and his J.D. from the University of Nebraska College of Law. Based on Mr. Oltmans' pharmaceutical industry experience, the Board believes that Mr. Oltmans has the appropriate set of skills to serve as a member of the Board.

**CORPORATE GOVERNANCE**

During 2021, our Board held ten meetings and took one action by unanimous written consent.

**Audit Committee**

The Audit Committee currently consists of Neil Herskowitz, Jay Kranzler, M.D., PhD, and Curtis Oltmans. Mr. Herskowitz serves as the Chairperson of the Audit Committee.

The Audit Committee was formed on May 15, 2017 and held four meetings during the fiscal year ended December 31, 2021. The duties and responsibilities of the Audit Committee are set forth in the Charter of the Audit Committee which was recently reviewed by our Audit Committee. Our Audit Committee determined that no revisions needed to be made to the charter at this time. A copy of the Charter of the Audit Committee is available on our website, located at [www.avenuetx.com](http://www.avenuetx.com). Among other matters, the duties and responsibilities of the Audit Committee include reviewing and monitoring our financial statements and internal accounting procedures, the selection of our independent registered public accounting firm and consulting with and reviewing the services provided by our independent registered public accounting firm. Our Audit Committee has sole discretion over the retention, compensation, evaluation and oversight of our independent registered public accounting firm.



The SEC and Nasdaq have established rules and regulations regarding the composition of audit committees and the qualifications of audit committee members. Our Board of Directors has examined the composition of our Audit Committee and the qualifications of our Audit Committee members in light of the current rules and regulations governing audit committees. Based upon this examination, our Board of Directors has determined that each member of our Audit Committee is independent and is otherwise qualified to be a member of our Audit Committee in accordance with the rules of the SEC and Nasdaq.

Additionally, the SEC requires that at least one member of the Audit Committee have a “heightened” level of financial and accounting sophistication. Such a person is known as the “audit committee financial expert” under the SEC’s rules. Our Board has determined that Neil Herskowitz is an “audit committee financial expert,” as the SEC defines that term, and is an independent member of our Board of Directors and our Audit Committee.

#### **Compensation Committee**

The Compensation Committee was formed on May 15, 2017. The Compensation Committee held one meeting during the fiscal year ended December 31, 2021 and took action by one unanimous written consent. The Compensation Committee currently consists of Jay Kranzler, M.D. PhD, Curtis Oltmans and Neil Herskowitz, with Dr. Kranzler serving as Chairman. The duties and responsibilities of the Compensation Committee are set forth in the Charter of the Compensation Committee. A copy of the Charter of the Compensation Committee is available on our website, located at [www.avenuetx.com](http://www.avenuetx.com). As discussed in its charter, among other things, the duties and responsibilities of the Compensation Committee include annually reviewing and approving corporate goals and objectives relevant to the compensation of our Chief Executive Officer, reviewing and approving, or making recommendations to our Board of Directors with respect to, the compensation of our Chief Executive Officer and our other executive officers, overseeing an evaluation of our senior executives, and overseeing and administering our cash and equity incentive plans. The Compensation Committee applies discretion in the determination of individual executive compensation packages to ensure compliance with the Company’s compensation philosophy. The Chief Executive Officer makes recommendations to the Compensation Committee with respect to the compensation packages for officers other than herself. The Compensation Committee may delegate its authority to grant awards to certain employees, and within specified parameters under the Avenue Therapeutics, Inc. 2015 Incentive Plan (the “2015 Incentive Plan”), to a special committee consisting of one or more directors who may but need not be officers of the Company. As of February 28, 2022, however, the Compensation Committee had not delegated any such authority. The Board may engage a compensation consultant to conduct a review of its executive compensation programs in 2022. The Committee did not engage a compensation consultant in 2021.

Nasdaq has established rules and regulations regarding the composition of compensation committees and the qualifications of compensation committee members. As a controlled company, we are not required to have a compensation committee composed entirely of independent directors. However, our Board of Directors has examined the composition of our Compensation Committee and the qualifications of our Compensation Committee members in light of the current rules and regulations governing compensation committees. Based upon this examination, our Board of Directors has determined that each member of our Compensation Committee is independent and is otherwise qualified to be a member of our Compensation Committee in accordance with such rules.

#### **Nominating Process**

We do not currently have a nominating committee or any other committee serving a similar function. Director nominations are approved by a vote of a majority of our independent directors as required under the Nasdaq rules and regulations. Although we do not have a written charter in place to select director nominees, our Board of Directors has adopted resolutions regarding the director nomination process. We believe that the current process in place functions effectively to select director nominees who will be valuable members of our Board of Directors.

We identify potential nominees to serve as directors through a variety of business contacts, including current executive officers, directors, community leaders and stockholders. We may, to the extent they deem appropriate, retain a professional search firm and other advisors to identify potential nominees.

We will also consider candidates recommended by stockholders for nomination to our Board. A stockholder who wishes to recommend a candidate for nomination to our Board must submit such recommendation to our Corporate Secretary, Lucy Lu, at our offices located at 1140 Avenue of the Americas, Floor 9, New York, New York 10036. Any recommendation must be received not less than 50 calendar days nor more than 90 calendar days before the anniversary date of the previous year’s annual meeting. All stockholder recommendations of candidates for nomination for election to our Board must be in writing and must set forth the following: (i) the candidate’s name, age, business address, and other contact information, (ii) the number of shares of common stock beneficially owned by the candidate, (iii) a complete description of the candidate’s qualifications, experience, background and affiliations, as would be

required to be disclosed in the proxy statement pursuant to Schedule 14A under the Exchange Act, (iv) a sworn or certified statement by the candidate in which he or she consents to being named in the proxy statement as a nominee and to serve as director if elected, and (v) the name and address of the stockholder(s) of record making such a recommendation.

We believe that our Board as a whole should encompass a range of talent, skill, and expertise enabling it to provide sound guidance with respect to our operations and interests. Our independent directors evaluate all candidates to our Board by reviewing their biographical information and qualifications. If the independent directors determine that a candidate is qualified to serve on our Board, such candidate is interviewed by at least one of the independent directors and our Chief Executive Officer. Other members of the Board also have an opportunity to interview qualified candidates. The independent directors then determine, based on the background information and the information obtained in the interviews, whether to recommend to the Board that the candidate be nominated for approval by the stockholders to fill a directorship. With respect to an incumbent director whom the independent directors are considering as a potential nominee for re-election, the independent directors review and consider the incumbent director's service during his or her term, including the number of meetings attended, level of participation, and overall contribution to the Board. The manner in which the independent directors evaluate a potential nominee will not differ based on whether the candidate is recommended by our directors or stockholders.

We consider the following qualifications, among others, when making a determination as to whether a person should be nominated to our Board: the independence of the director nominee; the nominee's character and integrity; financial literacy; level of education and business experience, including experience relating to biopharmaceutical companies; whether the nominee has sufficient time to devote to our Board; and the nominee's commitment to represent the long-term interests of our stockholders. We review candidates in the context of the current composition of the Board and the evolving needs of our business. We believe that each of the current members of our Board (who are also our director nominees) has the requisite business, biopharmaceutical, financial or managerial experience to serve as a member of the Board, as described above in their biographies under the heading "Our Board of Directors." We also believe that each of the current members of our Board has other key attributes that are important to an effective board, including integrity, high ethical standards, sound judgment, analytical skills, and the commitment to devote significant time and energy to service on the Board and its committees.

We do not have a formal policy in place with regard to diversity in considering candidates for our Board, but the Board strives to nominate candidates with a variety of complementary skills so that, as a group, the Board will possess the appropriate talent, skills and expertise to oversee our business.

## OUR EXECUTIVE OFFICERS

### Executive Officers

Our current executive officers are as follows:

<u>Name</u>	<u>Age</u>	<u>Position</u>
Lucy Lu, M.D.	47	President, Chief Executive Officer, Interim Chief Financial Officer and Director

No executive officer is related by blood, marriage or adoption to any other director or executive officer. To read more about Dr. Lu, please see her description under "OUR DIRECTORS".

### Code of Business Conduct and Ethics

We have adopted a Code of Ethics, or the Code, which applies to all of our directors and employees, including our principal executive officer and principal financial officer. The Code includes guidelines dealing with the ethical handling of conflicts of interest, compliance with federal and state laws, financial reporting, and our proprietary information. The Code also contains procedures for dealing with and reporting violations of the Code. We have posted our Code on our website, located at [www.avenuetx.com](http://www.avenuetx.com).

### Delinquent Section 16(a) Reports

Section 16(a) of the Exchange Act requires our directors, executive officers and persons who own more than 10% of the shares of our common stock to file an initial report of ownership on Form 3 and changes in ownership on Form 4 or Form 5 with the SEC. Such officers, directors and 10% stockholders are also required by SEC rules to furnish us with copies of any Forms 3, 4 or 5 that they file.

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The SEC rules require us to disclose late filings of initial reports of stock ownership and changes in stock ownership by our directors, executive officers and 10% stockholders. Based solely on a review of copies of the Forms 3, 4 and 5 furnished to us by reporting persons and any written representations furnished by certain reporting persons, we believe that during the fiscal year ended December 31, 2021, all Section 16(a) filing requirements applicable to our directors, executive officers and 10% stockholders were completed in a timely manner, with the exception of one (1) report as follows: the Form 3 related to Curtis Oltmans filed on December 21, 2021.

**Item 11. Executive Compensation**

As an emerging growth company, we are eligible to take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies. These include, but are not limited to, reduced disclosure obligations regarding executive compensation in our proxy statements, including the requirement to include a Compensation Discussion and Analysis, as well as an exemption from the requirement to hold a non-binding advisory vote on executive compensation. We have elected to comply with the scaled disclosure requirements applicable to emerging growth companies. For 2021, our only “named executive officers” or “NEOs” were Lucy Lu, M.D., our Chief Executive Officer and Interim Chief Financial Officer, and Joseph Vazzano, our former Chief Financial Officer who resigned on January 14, 2022 to pursue other opportunities.

**Summary Compensation Table**

The following table sets forth information concerning compensation paid by us to our NEOs for their services rendered to us in all capacities during the years ended December 31, 2021 and 2020:

Name and Principal Position	Year	Salary (\$)	Bonus (\$)	Stock Awards (\$)(1)	Non-equity Incentive Plan Compensation (\$)	All Other Compensation (\$)(2)	Total (\$)
<b>Lucy Lu</b>	2021	454,647	—	382,803	233,079	11,600	1,082,129
Chief Executive Officer	2020	431,627	—	—	—	11,400	443,027
<b>Joseph Vazzano (3)</b>	2021	255,747	—	93,470	80,513	11,600	441,330
Chief Financial Officer	2020	206,000	—	—	—	8,890	214,890

(1) Reflects the aggregate grant date fair value of restricted stock and restricted stock units granted during the fiscal year calculated in accordance with FASB ASC Topic 718. The valuation of restricted stock and restricted stock units is based on our closing stock price on the grant date.

(2) Reflects 401(k) company contributions.

(3) Mr. Vazzano resigned from the Company to pursue other opportunities on January 14, 2022.

**Narrative to Summary Compensation Table**

*Employment Agreement with Dr. Lu*

On June 10, 2015, we entered into an Employment Agreement with Lucy Lu, M.D. to serve as our Interim President and Chief Executive Officer upon the completion of our initial public offering at an annualized salary of \$395,000. Dr. Lu's Employment Agreement became effective on June 26, 2017, and she became our President and Chief Executive Officer. Dr. Lu's salary for 2021 and 2020 was \$454,647 and \$431,627 respectively. Her salary for 2022 was increased to \$550,000. Under the terms of Dr. Lu's Employment Agreement, Dr. Lu's base salary may be reduced only in connection with a company-wide decrease in executive compensation. Dr. Lu is also eligible to receive an annual discretionary bonus, not to exceed 50% of her base salary, if certain financial, clinical development, and/or business milestones are met in the discretion of Board of Directors. Such milestones are established annually by mutual agreement between Dr. Lu and the Board of Directors.

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Dr. Lu's employment with us is at will and may be terminated by us at any time and for any reason. On November 12, 2018, we amended our Employment Agreement with Dr. Lu. Under the terms of the Amended Employment Agreement, if we terminate Dr. Lu's employment without cause (as defined in the Employment Agreement) or if Dr. Lu resigns her employment for good reason (as defined in the Employment Agreement), Dr. Lu will be entitled to receive the following:

- cash severance equal to her annual salary, paid over a period of twelve months;
- payment of the premiums to continue health care coverage for Dr. Lu and her eligible dependents under COBRA for up to twelve months;
- a pro rata share of her annual bonus, to be paid when and if such bonus would have been paid under the Employment Agreement; and
- immediate accelerated vesting of all of her unvested equity awards.

If Dr. Lu's employment is terminated due to her death or complete disability (as defined in the Employment Agreement), she will be entitled to receive the following:

- cash severance equal to ninety days' annual salary, paid over a period of ninety days;
- a pro rata share of her annual bonus, to be paid when and if such bonus would have been paid under the Employment Agreement; and
- immediate accelerated vesting of all of her unvested equity awards.

*Employment Agreement with Mr. Vazzano*

Mr. Vazzano's salary for 2021 and 2020 was \$255,747 and \$206,000, respectively. As described in our letter agreement with Mr. Vazzano, Mr. Vazzano is eligible to receive an annual bonus of up to 25% of his base salary, as determined by the Company in its discretion based upon factors including corporate and individual performance. On July 1, 2021 we increased Mr. Vazzano's salary to \$300,000 and increased his bonus target to 35% of his base salary. His salary for 2022 was increased to \$320,000. On January 14, 2022, Mr. Vazzano resigned from the Company to pursue other opportunities.

*Annual Incentive Bonus*

In 2021, Dr. Lu was eligible to earn an annual bonus equal of up to 50% of her base salary. In 2021, Mr. Vazzano was eligible to earn an annual bonus equal of up to 25% of his base salary through June 30, 2021 and then 35% of his base salary from July 1, 2021 through December 31, 2021. Dr. Lu's and Mr. Vazzano's bonus opportunities for 2021 were based upon the Company's performance against pre-established corporate goals and objectives, which included a combination of corporate, regulatory, and financial goals.

These goals and objectives were achieved at an aggregate level of 100% and accordingly Dr. Lu and Mr. Vazzano were paid 100% of their target bonus amount. The actual amounts paid to the executives pursuant to their annual cash incentive awards and bonuses are reported in the "Summary Compensation Table" as "Non-equity Incentive Compensation".

**Equity Awards**

The Compensation Committee has granted each of Dr. Lu and Mr. Vazzano the following equity awards under our 2015 Incentive Plan. In 2021, Dr. Lu received an award of 411,616 restricted stock units ("RSUs"), and Mr. Vazzano received an award of 100,505 RSUs, each of which vests as described in Footnote 6 to the Outstanding Equity Awards Table below.

**Outstanding Equity Awards at 2021 Fiscal Year End**

Stock Awards						
Name	Grant Date	Number of Shares or Units of Stock that Have Not Vested	Market Value of Shares or Units of Stock that Have Not Vested (\$) (1)	Equity Incentive Plan Awards: Number of Unearned Shares, Units or Other Rights that Have Not Vested	Equity Incentive Plan Awards: Market Value of Payout Value of Unearned Shares, Units or Other Rights that Have Not Vested (\$) (1)	Equity Incentive Plan Awards: Market Value of Payout Value of Unearned Shares, Units or Other Rights that Have Not Vested (\$) (1)
Lucy Lu	6/10/2015	—	—	50,000 (2)	—	45,500
Lucy Lu	8/8/2017	215,000 (3)	195,650	—	—	—
Lucy Lu	8/7/2018	250,000 (4)	227,500	—	—	—
Lucy Lu	12/17/2021	411,616 (6)	374,571	—	—	—
Joseph Vazzano	8/7/2018	7,500 (5)	6,825	—	—	—
Joseph Vazzano	12/17/2021	100,505 (6)	91,460	—	—	—

- (1) The market value of unvested restricted stock awards/units was calculated by multiplying the number of units by \$0.91, the closing sales price of our common stock on December 31, 2021.
- (2) Represents 166,667 restricted stock awards vesting upon achievement of goals and objectives relating to the development of IV Tramadol of which 50,000 remained unvested as of December 31, 2021.
- (3) Represents restricted stock units vesting upon Dr. Lu's request for the shares.
- (4) Represents restricted stock units vesting as follows: 75% on the earlier of Dr. Lu's request for the shares or August 7, 2022, and 25% on August 7, 2022.
- (5) Represents restricted stock units vesting annually in equal installments on August 7, 2019 – 2022.
- (6) Represents restricted stock units vesting on March 15, 2022.

**Potential Payments upon Termination or Change in Control**

As detailed above, we have an amended employment agreement with Dr. Lu that provides certain compensation and benefits in the event of a termination of her employment or change in control under certain conditions. In addition, Dr. Lu's amended employment agreement and our equity plan provide certain equity award benefits in connection with a termination or change in control.

*Dr. Lu's Restricted Shares*

- If we terminate Dr. Lu's employment without "cause" or Dr. Lu resigns for "good reason," at any time, then all of her unvested equity awards will become fully vested.
- If Dr. Lu's employment terminates as a result of her death or "disability," all of her unvested equity awards will become fully vested.

*Other Awards Granted under the 2015 Incentive Plan*

- Unless otherwise provided in an award certificate or any special plan document governing an award granted under our 2015 Incentive Plan, upon the occurrence of a change in control of our company, (i) all outstanding options, SARs and other awards in the nature of rights that may be exercised will become fully exercisable, (ii) all time-based vesting restrictions on outstanding awards will lapse; and (iii) the payout opportunities attainable under all outstanding performance-based awards will vest based on target performance and the awards will pay out on a pro rata basis, based on the time elapsed prior to the change in control.

- The Compensation Committee may, in its discretion, accelerate the vesting and/or payment of any awards granted under our 2015 Incentive Plan for any reason, subject to certain limitations under Section 409A of the Internal Revenue Code. The Compensation Committee is not required to treat different participants and awards the same in exercising such discretion.

## DIRECTOR COMPENSATION

### Director Compensation Program

Our directors set compensation for non-employee directors on an annual basis in accordance with our 2015 Incentive Plan. Our non-employee directors currently receive the following compensation for service to the Board:

#### Cash Compensation:

- \$50,000 annual retainer;
- \$10,000 additional annual retainer for the Executive Chairman of the Board; and
- \$10,000 additional annual retainer for the Audit Committee Chair.

#### Equity Compensation:

- Initial Equity Grant: 50,000 shares of restricted stock, which shares shall vest and become non-forfeitable in equal annual installments over three years, beginning on the third (3rd) anniversary of the grant date, subject to the director's continued service on the board of directors on such date. This grant was waived for the InvaGen appointed directors.
- Re-Election Equity Grant: The greater of (i) a number of shares of restricted stock having a fair market value on the grant date of \$50,000, or (ii) 10,000 shares of restricted stock, which shares shall vest and become non-forfeitable on the third (3rd) anniversary of the grant date, subject to the director's continued service on the board of directors on such date. This grant was waived for the non-independent InvaGen appointed directors and Dr. Rosenwald.

In addition, each non-employee director receives reimbursement for reasonable travel expenses incurred in attending meetings of our board of directors and meetings of committees of our board of directors.

### Director Compensation Table

The following table sets forth the cash and other compensation we paid to the non-employee members of our Board of Directors for all services in all capacities during 2021.

Name	Fees Earned or Paid in Cash (1)	Stock Awards (2)	Total (\$)
Lindsay A. Rosenwald	—	—	—
Neil Herskowitz	60,000	64,189	124,189
Jay Kranzler	50,000	64,189	114,189
Jaideep Gogtay	—	—	—
Curtis Oltmans	37,500	45,589	83,089
Elizabeth Garrett Ingram	—	—	—

- (1) Represents cash retainer for serving on our Board and committees of the Board.
- (2) Reflects the aggregate grant date fair value of restricted stock granted during the fiscal year calculated in accordance with FASB ASC Topic 718. The valuation of restricted stock awards is based on our closing stock price on the grant date.
- (3) As of December 31, 2021, the aggregate number of restricted stock and restricted stock units held by each non-employee director was as follows: Dr. Rosenwald, 3,333 restricted stock awards; Mr. Herskowitz, 85,686 restricted stock awards; Dr. Kranzler, 85,686 restricted stock awards; Mr. Oltmans, 49,020 restricted stock awards; and 0 for each of Dr. Gogtay and Ms. Ingram.

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

The following table shows information, as of December 31, 2021, concerning the beneficial ownership of our common stock by:

- each person we know to be the beneficial owner of more than 5% of our common stock;
- each of our current directors;
- each of our NEOs shown in our Summary Compensation Table; and
- all current directors and NEOs as a group.

As of December 31, 2021, there were 21,089,658 shares of our common stock outstanding. Beneficial ownership is determined according to the rules of the SEC and generally means that a person has beneficial ownership of a security if he, she or it possesses sole or shared voting or investment power of that security, including options and warrants that are currently exercisable or exercisable within 60 days of December 31, 2021. Shares of our common stock issuable pursuant to stock options are deemed outstanding for computing the percentage of the person holding such options and the percentage of any group of which the person is a member but are not deemed outstanding for computing the percentage of any other person. Except as indicated by the footnotes below, we believe, based on the information furnished to us, that the persons named in the table below have sole voting and investment power with respect to all shares of common stock shown that they beneficially own, subject to community property laws where applicable. The information does not necessarily indicate beneficial ownership for any other purpose, including for purposes of Section 13(d) and 13(g) of the Securities Act.

Unless otherwise indicated, the address for each director and executive officer listed is: c/o Avenue Therapeutics, Inc., 1140 Avenue of the Americas, Floor 9, New York, NY 10036.

Name of Beneficial Owner	Number of Shares Beneficially Owned	Percentage of Shares Beneficially Owned
Lucy Lu	337,333	2 %
Joseph Vazzano	65,252	*
Lindsay A. Rosenwald	251,330 (1)	1 %
Neil Herskowitz	134,724	*
Jay Kranzler	84,663	*
Jaideep Gogtay	—	*
Curtis Oltmans	—	*
Elizabeth Garrett Ingram	16,000	*
All Executive officers and directors as a group (8 persons)	722,635 (2)	3 %
<b>5% or Greater Stockholders:</b>		
Fortress Biotech, Inc.	3,590,096 (3)	17 %
InvaGen Pharmaceuticals, Inc.	5,833,333	28 %

\*Less than 1%

- (1) Dr. Rosenwald has warrants convertible into 166,667 shares of our common stock. The warrants were issued by Fortress and are convertible into shares of our common stock that are owned by Fortress. These do not represent equity compensation by us to Dr. Rosenwald.
- (2) The total calculation for all executive officers and directors as a group does not include Dr. Rosenwald's warrants, which have not yet been exercised.
- (3) Excludes 250,000 Class A Preferred shares owned by Fortress. See "Relationships and Related Transactions" for a description of Fortress' ownership.

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

Other than the ongoing related party transactions described below, since January 1, 2021, the Company has not been a party to any transaction in which the amount involved exceeded or will exceed \$120,000, and in which any of its directors, named executive officers or beneficial owners of more than 5% of the Company's capital stock, or an affiliate or immediate family member thereof, had or will have a direct or indirect material interest, other than compensation, termination, and change-in-control arrangements.

The written charter of the Audit Committee authorizes, and the Nasdaq Stock Market listing rules require, the Audit Committee to review and approve related-party transactions. In reviewing related-party transactions, the Audit Committee applies the basic standard that transactions with affiliates should be made on terms no less favorable to the Company than could have been obtained from unaffiliated parties. Therefore, the Audit Committee reviews the benefits of the transactions, terms of the transactions and the terms available from unrelated third parties, as applicable. All transactions other than compensatory arrangements between the Company and its officers, directors, principal stockholders and their affiliates will be approved by the Audit Committee or a majority of the disinterested directors, and will continue to be on terms no less favorable to the Company than could be obtained from unaffiliated third parties.

The following is a summary of significant transactions or series of similar transactions since the inception of Avenue to which it was or is a party and that:

- the amount involved exceeded or exceeds \$120,000 or is greater than 1% of our total assets; and
- any of our directors or executive officers, any holder of 5% of our capital stock or any member of their immediate family had or will have a direct or indirect material interest.

***Founders Agreement and Management Services Agreement with Fortress***

Fortress entered into a Founders Agreement with Avenue in February 2015, pursuant to which Fortress assigned to Avenue all of its rights and interest under Fortress's license agreement with Revenogenex for IV Tramadol (the "License Agreement"). As consideration for the Founders Agreement, Avenue assumed \$3.0 million in debt that Fortress accumulated for expenses and costs of forming Avenue and obtaining the IV Tramadol license. This debt was repaid to Fortress in 2017. As additional consideration for the transfer of rights under the Founders Agreement, Avenue shall also: (i) issue annually to Fortress, on the anniversary date of the Founders Agreement, shares of common stock equal to two and one half percent (2.5%) of the fully-diluted outstanding equity of Avenue at the time of issuance; (ii) pay an equity fee in shares of Avenue common stock, payable within five (5) business days of the closing of any equity or debt financing for Avenue or any of its respective subsidiaries that occurs after the effective date of the Founders Agreement and ending on the date when Fortress no longer has majority voting control in Avenue's voting equity, equal to two and one half percent (2.5%) of the gross amount of any such equity or debt financing; and (iii) pay a cash fee equal to four and one half percent (4.5%) of Avenue's annual net sales, payable on an annual basis, within ninety (90) days of the end of each calendar year. In the event of a change in control (as it is defined in the Founders Agreement), Fortress will be paid a one-time change in control fee equal to five (5x) times the product of (i) net sales for the twelve (12) months immediately preceding the change in control and (ii) four and one-half percent (4.5%). This additional consideration was waived on November 12, 2018 with the Waiver Agreement signed between Avenue, Fortress and InvaGen.

On September 13, 2016, we entered into an Amended and Restated the Founders Agreement, ("A&R Founders Agreement") with Fortress. The A&R Founders Agreement eliminated the Annual Equity Fee in connection with the original agreement and added a term of 15 years, which upon expiration automatically renews for successive one-year periods unless terminated by Fortress or a Change in Control occurs. Concurrently with the A&R Founders Agreement, the Company entered into an Exchange Agreement whereby the Company exchanged Fortress' 2.3 million Class A common shares for approximately 2.5 million common shares and 250,000 Class A Preferred shares.

Effective as of February 17, 2015, Fortress entered into a Management Services Agreement (the "MSA") with Avenue and each of Avenue's current directors and officers who are directors or officers of Fortress, excluding services provided by Dr. Lucy Lu, the Company's current Chief Executive Officer as of June 26, 2017 and the former Chief Financial Officer of Fortress (resigned as of June 26, 2017), to provide services to Avenue pursuant to the terms of the MSA. Pursuant to the terms of the MSA, for a period of five (5) years, Fortress will render advisory and consulting services to Avenue. Services provided under the MSA may include, without limitation, (i) advice and assistance concerning any and all aspects of Avenue's operations, clinical trials, financial planning and strategic transactions and financings and (ii) conducting relations on behalf of Avenue with accountants, attorneys, financial advisors and other professionals (collectively, the "Services"). Avenue is obligated to utilize clinical research services, medical education, communication and marketing services and investor relations/public relation services of companies or individuals designated by Fortress, provided those



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services are offered at market prices. However, Avenue is not obligated to take or act upon any advice rendered from Fortress and Fortress shall not be liable for any of Avenue's actions or inactions based upon their advice. Fortress and its affiliates, including all members of Avenue's Board of Directors, have been contractually exempt from fiduciary duties to Avenue relating to corporate opportunities. In consideration for the Services, Avenue will pay Fortress an annual consulting fee of \$0.5 million (the "Annual Consulting Fee"), payable in advance in equal quarterly installments on the first business day of each calendar quarter in each year, provided, however, that such Annual Consulting Fee shall be increased to \$1.0 million for each calendar year in which Avenue has net assets in excess of \$100.0 million at the beginning of the calendar year.

For the years ended December 31, 2021 and 2020, we had \$0 in expenses related to the MSA for both periods. Effective November 12, 2018, the MSA fee was waived with the Waiver Agreement signed between Avenue, Fortress and InvaGen.

***Facility Agreement with Fortress and InvaGen***

On June 12, 2020, Avenue, Fortress and InvaGen entered into a Facility Agreement ("Facility Agreement") whereby beginning on October 1, 2020 we were able to borrow up to \$2.0 million collectively from Fortress and InvaGen, subject to certain conditions set forth herein. Fortress' commitment amount is \$0.8 million, and InvaGen's is \$1.2 million, and a 7% per annum interest rate applies (payable on the last day of each fiscal quarter). Repayment of the loan was due upon the earliest of i) the second stage closing ii) April 29, 2021 and iii) the date that is 30 days following the termination of the SPMA. The Facility Agreement expired on April 29, 2021 and was unused.

***Secondment Agreement between Fortress, InvaGen and Journey Medical Corporation***

Effective June 1, 2021, Avenue, InvaGen, Fortress and Journey Medical Corporation ("Journey"), a consolidated entity under Fortress, entered into a secondment agreement for a certain Avenue employee to be seconded to Journey. During the secondment, Journey had the authority to supervise the Avenue employee and will reimburse the Company for the employee's salary and salary-related costs. The term of this agreement lasted until the employee's services were needed again by the Company which was December 1, 2021. The amounts reimbursable to Avenue were \$0.2 million for the year ended December 31, 2021.

***Director Independence and Controlled Company Exemption***

The Company's common stock is listed on the Nasdaq Capital Market. The rules of Nasdaq require our Board to make an affirmative determination as to the independence of each director and require a majority of the Company's directors be "independent directors," as defined by Nasdaq rules. In addition, Nasdaq rules require that, subject to specified exceptions, each member of a company's audit, compensation and nominating committee be independent. Audit committee and compensation committee members must also satisfy enhanced independence criteria under certain SEC rules and corresponding Nasdaq rules.

Consistent with these rules, our Board undertook its annual review of director independence in December 2021. During the review, our Board considered relationships and transactions during the 2021 fiscal year and since inception between each director or any member of his immediate family, on the one hand, and the Company on the other hand. The purpose of this review was to determine whether any such relationships or transactions were inconsistent with a determination that the director is independent. Based on this review, our Board determined that Neil Herskowitz, Jay Kranzler, and Curtis Oltmans are independent under the criteria established by Nasdaq and our Board.

As a result of Fortress' control over our Class A Preferred Stock, we qualify as a "controlled company" and avail ourselves of certain "controlled company" exemptions under the Nasdaq corporate governance rules. As a controlled company, we are not required to have a majority of "independent directors" on our Board as defined under the Nasdaq rules, or have a compensation, nominating or governance committee composed entirely of independent directors. In light of our status as a controlled company, our Board has determined to utilize the majority board independence exemption.

***Parent Company***

Our Company is a wholly-owned subsidiary of Fortress Biotech, Inc. ("Fortress"). As of February 28, 2022, Fortress holds approximately 17% of our issued and outstanding voting securities. This excludes the 250,000 Class A Preferred shares owned by Fortress.

**Item 14. Principal Accounting Fees and Services**

The following presents the aggregate fees billed to the Company for professional services rendered by BDO USA, LLP, (“BDO”) for our years ended December 31, 2021 and 2020:

**Audit Fees**

For the fiscal years ended December 31, 2021 and 2020, BDO billed us an aggregate of \$302,550 and \$158,300 respectively, in fees for the professional services rendered in connection with the audit of our annual financial statements included in our Annual Report on Form 10-K for those two fiscal years, the review of our financial statements included in our Quarterly Reports on Form 10-Q during those two fiscal years, and other services provided in connection with registration statements.

**Audit-Related Fees**

During the fiscal years ended December 31, 2021 and 2020, we were not billed by BDO for any fees for audit-related services reasonably related to the performance of the audits and reviews for those two fiscal years, in addition to the fees described above under the heading “Audit Fees.”

**Tax Fees**

During the fiscal years ended December 31, 2021 and 2020, we were not billed by BDO for any fees for professional services rendered for tax compliance, tax advice, and tax planning services.

**All Other Fees**

During the fiscal years ended December 31, 2021 and 2020, we were not billed by BDO for any fees for services, other than those described above, rendered to us for those two fiscal years.

**Pre-Approval of Services**

Our Audit Committee has established a policy setting forth the procedures under which services provided by our independent registered public accounting firm will be pre-approved by our Audit Committee. The potential services that might be provided by our independent registered public accounting firm fall into two categories:

- Services that are permitted, including the audit of our annual financial statements, the review of our quarterly financial statements, related attestations, benefit plan audits and similar audit reports, financial and other due diligence on acquisitions, and federal, state, and non-US tax services; and
- Services that may be permitted, subject to individual pre-approval, including compliance and internal-control reviews, indirect tax services such as transfer pricing and customs and duties, and forensic auditing.

Services that our independent registered public accounting firm are prohibited from providing include such services as bookkeeping, certain human resources services, internal audit outsourcing, and investment or investment banking advice.

All proposed engagements of our independent registered public accounting firm, whether for audit services or permissible non-audit services, are pre-approved by the Audit Committee. We jointly prepare a schedule with our independent registered public accounting firm that outlines services which we reasonably expect we will need from our independent registered public accounting firm and categorize them according to the classifications described above. Each service identified is reviewed and approved or rejected by the Audit Committee.

**PART IV**

**Item 15. Exhibits and Financial Statement Schedules**

**(a) Financial Statements.**

The following financial statements are filed as part of this report:

<a href="#">Report of Independent Registered Public Accounting Firm (BDO USA, LLP, New York, NY; PCAOB ID#243)</a>	F-1
<a href="#">Financial Statements:</a>	
<a href="#">Balance Sheets</a>	F-2
<a href="#">Statements of Operations</a>	F-3
<a href="#">Statements of Stockholders' Equity</a>	F-4
<a href="#">Statements of Cash Flows</a>	F-5
<a href="#">Notes to Financial Statements</a>	F-6

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(b) Exhibits.

<u>Exhibit No.</u>	<u>Description</u>
3.1	<a href="#">Third Amended and Restated Certificate of Incorporation of Avenue Therapeutics, Inc., filed as Exhibit 3.1 to Form 8-K filed on June 27, 2017 (File No. 001-38114) and incorporated herein by reference.</a>
3.2	<a href="#">Certificate of Amendment of the Third Amended and Restated Certificate of Incorporation of Avenue Therapeutics, Inc., filed as Exhibit 3.1 to Form 10-Q filed on August 14, 2018 (File No. 001-38114) and incorporated herein by reference.</a>
3.3	<a href="#">Amended and Restated Bylaws of Avenue Therapeutics, Inc., filed as Exhibit 3.1 to Form 8-K filed on February 11, 2019 (File No. 000-38114) and incorporated herein by reference.</a>
4.1	<a href="#">Specimen certificate evidencing shares of Common Stock, filed as Exhibit 4.1 to Form 10-12G filed on January 12, 2017 (File No. 000-55556) and incorporated herein by reference.</a>
4.2	<a href="#">Form of warrant agreement, filed as Exhibit 4.2 to Form 10-12G filed on January 12, 2017 (File No. 000-55556) and incorporated herein by reference.</a>
4.3	<a href="#">Description of Securities of Avenue Therapeutics, Inc.*</a>
10.1	<a href="#">Asset Transfer and License Agreement between Fortress Biotech, Inc. and Revogenex Ireland Limited dated February 17, 2015, filed as Exhibit 10.1 to Form 10-12G/A filed on March 13, 2017 (File No. 000-55556) and incorporated herein by reference.**</a>
10.2	<a href="#">First Amendment to Asset Transfer and License Agreement between Fortress Biotech, Inc. and Revogenex Ireland Limited dated June 23, 2016, filed as Exhibit 10.11 to Form 10-12G/A filed on March 13, 2017 (File No. 000-55556) and incorporated herein by reference.</a>
10.3	<a href="#">Second Amendment to Asset Transfer and License Agreement between Fortress Biotech, Inc. and Revogenex Ireland Limited dated May 4, 2017, filed as Exhibit 10.3 to Form S-1/A filed on May 22, 2017 (File No. 333-217552) and incorporated herein by reference.</a>
10.4	<a href="#">Amended and Restated Founders Agreement between Fortress Biotech, Inc. and Avenue Therapeutics, Inc. dated September 13, 2016, filed as Exhibit 10.2 to Form 10-12G filed on January 12, 2017 (File No. 000-55556) and incorporated herein by reference.</a>
10.5	<a href="#">Management Services Agreement between Fortress Biotech, Inc. and Avenue Therapeutics, Inc. effective as of February 17, 2015, filed as Exhibit 10.5 to Form 10-12G filed on January 12, 2017 (File No. 000-55556) and incorporated herein by reference.</a>
10.6	<a href="#">Employment Agreement with Dr. Lucy Lu, MD, dated June 10, 2015, filed as Exhibit 10.6 to Form 10-12G filed on January 12, 2017 (File No. 000-55556) and incorporated herein by reference.#</a>
10.7	<a href="#">Avenue Therapeutics, Inc. 2015 Incentive Plan, filed as Exhibit 10.7 to Form 10-12G filed on January 12, 2017 (File No. 000-55556) and incorporated herein by reference.</a>
10.8	<a href="#">Consulting Agreement with Dr. Scott A. Reines, dated July 22, 2015, filed as Exhibit 10.8 to Form 10-12G filed on January 12, 2017 (File No. 000-55556) and incorporated herein by reference.#</a>
10.9	<a href="#">First Amendment to Consulting Agreement with Dr. Scott A. Reines, dated January 25, 2016, filed as Exhibit 10.9 to Form 10-12G filed on January 12, 2017 (File No. 000-55556) and incorporated herein by reference.#</a>
10.10	<a href="#">Second Amendment to Consulting Agreement with Dr. Scott A. Reines, dated August 2, 2016, filed as Exhibit 10.10 to Form 10-12G/A filed on March 13, 2017 (File No. 000-55556) and incorporated herein by reference.#</a>

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10.11	<a href="#">Third Amendment to Consulting Agreement with Dr. Scott A. Reines, dated February 28, 2017, filed as Exhibit 10.12 to Form 10-12G/A filed on March 13, 2017 (File No. 000-55556) and incorporated herein by reference.#</a>
10.12	<a href="#">Stockholders Agreement, dated as of November 12, 2018, by and between Avenue Therapeutics, Inc., Fortress Biotech, Inc., Dr. Lucy Lu, M.D. and InvaGen Pharmaceuticals Inc., incorporated herein by reference from the Company's Form 8-K filed on November 14, 2018.</a>
10.13	<a href="#">First Amendment to Executive Employment Agreement, dated as of November 12, 2018, by and between Avenue Therapeutics, Inc. and Dr. Lucy Lu, M.D., incorporated herein by reference from the Company's Form 8-K filed on November 14, 2018.</a>
21.1	<a href="#">Subsidiaries of Avenue Therapeutics, Inc.*</a>
23.1	<a href="#">Consent of Independent Registered Public Accounting Firm, BDO USA, LLP.</a>
24.1	<a href="#">Power of Attorney (included on signature page).*</a>
31.1	<a href="#">Certification of Principal Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.*</a>
31.2	<a href="#">Certification of Principal Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.*</a>
32.1	<a href="#">Certification of Principal Executive Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.*</a>
32.2	<a href="#">Certification of Principal Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.*</a>
101	The following financial information from Avenue Therapeutics, Inc.'s Annual Report on Form 10-K for the year ended December 31, 2021, formatted in XBRL (eXtensible Business Reporting Language): (i) Balance Sheets, (ii) Statement of Operations, (iii) Statement of Stockholders' Equity, (iv) Statements of Cash Flows, and (v) the Notes to Financial Statements

\* Filed herewith.

\*\* Subject to a request for confidential treatment.

# Management Compensation Arrangement.

**Item 16. Form 10-K Summary**

None.

INDEX TO FINANCIAL STATEMENTS

<a href="#">Report of Independent Registered Public Accounting Firm (BDO USA, LLP; New York, NY; PCAOB ID#243)</a>	F-1
<a href="#">Balance Sheets</a>	F-2
<a href="#">Statements of Operations</a>	F-3
<a href="#">Statements of Stockholders' Equity</a>	F-4
<a href="#">Statements of Cash Flows</a>	F-5
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**REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

Stockholders and Board of Directors  
Avenue Therapeutics, Inc.  
New York, NY

**Opinion on the Financial Statements**

We have audited the accompanying balance sheets of Avenue Therapeutics, Inc. (the “Company”) as of December 31, 2021 and 2020, the related statements of operations, stockholders’ equity, and cash flows for the years then ended, and 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 at December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2021, in conformity with accounting principles generally accepted in the United States of America.

**Going Concern Uncertainty**

The accompanying financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the financial statements, the Company has suffered recurring losses from operations and has a capital deficiency that raise substantial doubt about its ability to continue as a going concern. Management’s plans in regard to these matters are also described in Note 1. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

**Basis for Opinion**

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

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

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

/s/ BDO USA, LLP

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

New York, NY  
March 25, 2022

**AVENUE THERAPEUTICS, INC.**  
**BALANCE SHEETS**  
**(In thousands, except share and per share amounts)**

	<u>December 31,</u> <u>2021</u>	<u>December 31,</u> <u>2020</u>
<b>ASSETS</b>		
Current Assets:		
Cash and cash equivalents	\$ 3,763	\$ 3,132
Other receivables - related party	90	—
Prepaid expenses and other current assets	107	113
Total current assets	<u>3,960</u>	<u>3,245</u>
<b>Total Assets</b>	<b><u>\$ 3,960</u></b>	<b><u>\$ 3,245</u></b>
<b>LIABILITIES AND STOCKHOLDERS' EQUITY</b>		
Current Liabilities:		
Accounts payable and accrued expenses	\$ 451	\$ 857
Accounts payable and accrued expenses - related party	58	29
Total current liabilities	<u>509</u>	<u>886</u>
<b>Total Liabilities</b>	<b><u>509</u></b>	<b><u>886</u></b>
<b>Commitments and Contingencies</b>		
<b>Stockholders' Equity</b>		
<b>Preferred Stock (\$0.0001 par value), 2,000,000 shares authorized</b>		
Class A Preferred Stock, 250,000 shares issued and outstanding as of December 31, 2021 and 2020, respectively	—	—
<b>Common Stock (\$0.0001 par value), 50,000,000 shares authorized</b>		
Common shares, 21,089,658 and 16,747,803 shares issued and outstanding as of December 31, 2021 and 2020, respectively	2	2
Additional paid-in capital	80,448	75,625
Accumulated deficit	(76,999)	(73,268)
Total Stockholders' Equity	<u>3,451</u>	<u>2,359</u>
<b>Total Liabilities and Stockholders' Equity</b>	<b><u>\$ 3,960</u></b>	<b><u>\$ 3,245</u></b>

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



**AVENUE THERAPEUTICS, INC.**  
**STATEMENTS OF OPERATIONS**  
**(In thousands, except share and per share amounts)**

	For the Years Ended	
	December 31, 2021	December 31, 2020
Operating expenses:		
Research and development	\$ 1,254	\$ 2,866
General and administrative	2,484	2,347
Loss from operations	(3,738)	(5,213)
Interest income	(7)	(62)
<b>Net Loss</b>	<b>\$ (3,731)</b>	<b>\$ (5,151)</b>
Net loss per common share outstanding, basic and diluted	\$ (0.22)	\$ (0.31)
Weighted average number of common shares outstanding, basic and diluted	16,997,564	16,506,447

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

**AVENUE THERAPEUTICS, INC.**  
**STATEMENTS OF STOCKHOLDERS' EQUITY**  
(In thousands, except share amounts)

	Year ended December 31, 2021						
	Class A Preferred		Common Shares		Additional paid-in capital	Accumulated deficit	Total Stockholders' equity
	Shares	Amount	Shares	Amount			
<b>Balance at December 31, 2020</b>	250,000	\$ —	16,747,803	\$ 2	\$ 75,625	\$ (73,268)	\$ 2,359
Share based compensation	—	—	192,060	—	442	—	442
Issuance of common shares, net of costs	—	—	4,148,905	—	4,381	—	4,381
Cashless exercise of warrants	—	—	890	—	—	—	—
Net loss	—	—	—	—	—	(3,731)	(3,731)
<b>Balance at December 31, 2021</b>	<u>250,000</u>	<u>\$ —</u>	<u>21,089,658</u>	<u>\$ 2</u>	<u>\$ 80,448</u>	<u>\$ (76,999)</u>	<u>\$ 3,451</u>

  

	Year ended December 31, 2020						
	Class A Preferred		Common Shares		Additional paid-in capital	Accumulated deficit	Total Stockholders' equity
	Shares	Amount	Shares	Amount			
<b>Balance at December 31, 2019</b>	250,000	\$ —	16,682,190	\$ 2	\$ 74,915	\$ (68,117)	\$ 6,800
Share based compensation	—	—	65,000	—	710	—	710
Cashless exercise of warrants	—	—	613	—	—	—	—
Net loss	—	—	—	—	—	(5,151)	(5,151)
<b>Balance at December 31, 2020</b>	<u>250,000</u>	<u>\$ —</u>	<u>16,747,803</u>	<u>\$ 2</u>	<u>\$ 75,625</u>	<u>\$ (73,268)</u>	<u>\$ 2,359</u>

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

**AVENUE THERAPEUTICS, INC.**  
**STATEMENTS OF CASH FLOWS**  
**(In thousands)**

	For the Years Ended	
	December 31, 2021	December 31, 2020
<b>Cash flows from operating activities:</b>		
Net loss	\$ (3,731)	\$ (5,151)
Adjustments to reconcile net loss to net cash used in operating activities:		
Share based compensation	442	710
Changes in operating assets and liabilities:		
Other receivables - related party	(90)	—
Prepaid expenses and other current assets	6	57
Accounts payable and accrued expenses	(406)	(244)
Accounts payable and accrued expenses - related party	29	15
Net cash and cash equivalents used in operating activities	<u>(3,750)</u>	<u>(4,613)</u>
<b>Cash flows from investing activities:</b>		
Milestone payment for research and development licenses	—	(1,000)
Net cash and cash equivalents used in investing activities	<u>—</u>	<u>(1,000)</u>
<b>Cash flows from financing activities:</b>		
Proceeds from the issuance of common shares	5,044	—
Payment of offering costs	(663)	—
Net cash provided by financing activities	<u>4,381</u>	<u>—</u>
Net change in cash and cash equivalents	631	(5,613)
Cash and cash equivalents, beginning of period	3,132	8,745
<b>Cash and cash equivalents, end of period</b>	<b><u>\$ 3,763</u></b>	<b><u>\$ 3,132</u></b>

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

**AVENUE THERAPEUTICS, INC**  
**Notes to Financial Statements**

**Note 1 — Organization, Plan of Business Operations**

Avenue Therapeutics, Inc. (the “Company” or “Avenue”) was incorporated in Delaware on February 9, 2015, as a wholly owned subsidiary of Fortress Biotech, Inc. (“Fortress”), to develop and market pharmaceutical products for the acute care setting in the United States. The Company is focused on developing its product candidate, an intravenous (“IV”) formulation of tramadol HCl (“IV Tramadol”), for post-operative acute pain.

**Stock Purchase and Merger Agreement**

On November 12, 2018, the Company, InvaGen Pharmaceuticals Inc. (“InvaGen”), and Madison Pharmaceuticals, Inc. entered into a Stock Purchase and Merger Agreement (“SPMA”), pursuant to which the Company agreed to its sale in a two-stage transaction. In the first stage, InvaGen agreed to purchase, for \$35 million, common shares representing 33.3% of the fully diluted capitalization of the Company. In the second stage, InvaGen would acquire the remaining issued and outstanding capital stock of the Company for approximately \$180 million in a reverse subsidiary merger transaction (the “Merger Transaction”). The SPMA was approved by a majority of the Company’s stockholders, including a majority of its non-affiliated stockholders, at its special shareholder meeting on February 6, 2019. On February 8, 2019, InvaGen acquired 5,833,333 shares of the Company’s common stock at \$6.00 per share (the “Stock Purchase Transaction”) for net proceeds of \$31.5 million after deducting commission fees and other offering costs, representing a 33.3% stake in the Company’s capital stock on a fully diluted basis.

Consummation of the Merger Transaction was conditioned upon, among other things, U.S. Federal Drug Administration (“FDA”) approval of IV Tramadol, its labeling and scheduling, and the absence of certain other restrictions in effect with respect to IV Tramadol. Pursuant to the SPMA, if FDA approval of IV Tramadol was not obtained on or before April 30, 2021, InvaGen would not be subject to the mandatory closing obligations set forth in the SPMA with respect to the Merger Transaction (but would instead retain an option to complete the Merger Transaction up until such time as the SPMA was terminated). Pursuant to the SPMA, the Company could choose to terminate the SPMA after October 31, 2021, if FDA approval of IV Tramadol had not occurred by such time. On November 1, 2021, the Company terminated the SPMA.

Even though the SPMA has been terminated, InvaGen retains certain rights pursuant to the Stockholders Agreement, entered into on November 12, 2018 between the Company, InvaGen and Fortress, and other agreements entered into in connection therewith on such date. These rights exist as long as InvaGen maintains at least 75% of the common shares acquired in the Stock Purchase Transaction and include among other things, the right to restrict the Company from certain equity issuances and changes to the Company’s capital stock without obtaining InvaGen’s prior written consent.

Over the past year, the Company has communicated with InvaGen relating to InvaGen’s assertions that Material Adverse Effects (as defined in the SPMA) have occurred due to the impact of the COVID-19 pandemic on potential commercialization and projected sales of IV Tramadol. Additionally, in connection with the resubmission of the Company’s New Drug Application (“NDA”) in February 2021, InvaGen communicated to the Company that it believes the proposed label for IV Tramadol would also constitute a Material Adverse Effect (as defined in the SPMA) on the purported basis that the proposed label under certain circumstances would make the product commercially unviable. Even though the SPMA has been terminated, it is still possible for InvaGen to pursue monetary claims against the Company and/or Fortress based on the foregoing or other potential causes of action.

**Liquidity and Capital Resources**

*Going Concern*

The Company is not yet generating revenue, has incurred substantial operating losses since its inception and expects to continue to incur significant operating losses for the foreseeable future as it executes on its product development plan and may never become profitable. As of December 31, 2021, the Company had an accumulated deficit of \$77.0 million.

On October 12, 2020, the Company announced that it had received a Complete Response Letter (“the First CRL”) from the FDA regarding the Company’s NDA for IV Tramadol. The First CRL cited deficiencies related to the terminal sterilization validation and stated that IV Tramadol, intended to treat patients in acute pain who require an opioid, is not safe for the intended patient population. On February 12, 2021, the Company resubmitted its NDA to the FDA for IV Tramadol. The NDA resubmission followed the receipt of official minutes from a Type A meeting with the FDA. The resubmission included revised language relating to the proposed product label and a report relating to terminal sterilization validation. On June 14, 2021, the Company announced that it had received a second Complete Response Letter (the “Second CRL”) from the FDA regarding the Company’s NDA for IV Tramadol. The Second CRL stated that the delayed and unpredictable onset of analgesia with IV Tramadol does not support its benefit as a monotherapy to treat patients in acute pain and that there is insufficient information to support that IV Tramadol in combination with other analgesics is safe and effective for the intended patient population. In particular, the Second CRL stated that, while the primary endpoint was met in two efficacy studies, meaningful pain relief was delayed (accounting for the use of rescue medication, e.g., ibuprofen), and some patients never achieved pain relief. The Company continues to pursue regulatory approval for IV Tramadol and had a Type A meeting with the FDA in July 2021. The FDA did not deviate from any of the positions the FDA previously took in the First CRL and the Second CRL. The Company submitted a formal dispute resolution request (“FDRR”) with the Office of Neuroscience of the FDA on July 27, 2021. On August 26, 2021, the Company received an Appeal Denied Letter from the Office of Neuroscience of the FDA in response to the FDRR submitted on July 27, 2021. On August 31, 2021, the Company submitted a FDRR with the Office of New Drugs (“OND”) of the FDA. On October 21, 2021, the Company received a written response from the OND of the FDA stating that the OND needs additional input from an Advisory Committee in order to reach a decision on the FDRR. For. On February 15, 2022, the Company had its Advisory Committee meeting with the FDA. In the final part of the public meeting, the Advisory Committee voted yes or no on the following question: “Has the Applicant submitted adequate information to support the position that the benefits of their product outweigh the risks for the management of acute pain severe enough to require an opioid analgesic in an inpatient setting?” The results were 8 yes votes and 14 no votes. On March 18, 2022, the Company received an Appeal Denied Letter from the OND in response to the FDRR. The Company is evaluating next steps with regard to IV Tramadol.

As of December 31, 2021, the Company had cash and cash equivalents of \$3.8 million. The Company believes that its cash and cash equivalents are only sufficient to fund its operating expenses into the second quarter of 2022. The Company will need to secure additional funds through equity or debt offerings, or other potential sources. Furthermore, under the SPMA, any equity funding must be approved by InvaGen. The Company cannot be certain that additional funding will be available to it on acceptable terms, or at all. These factors individually and collectively raise substantial doubt about the Company’s ability to continue as a going concern within one year from the date of this report. The financial statements do not contain any adjustments that might result from the resolution of any of the above uncertainty.

In addition, the Company experienced minimal impact on its development timelines and its liquidity due to the worldwide spread of COVID-19.

In light of the foregoing, it may be necessary at some point for the Company to seek protection under Chapter 11 of the United States Bankruptcy Code, which could have a material adverse impact on the Company’s business, financial condition, operations and could place its shareholders at significant risk of losing all of their investment. In any such Chapter 11 proceeding, the Company may seek to restructure its obligations or commence an orderly wind-down of its operations and sale of its assets, in either event, holders of equity interests could receive or retain little or no recovery. The Company also notes that the process of exploring refinancing or restructuring alternatives, including those under Chapter 11, may be disruptive to its business and operations.

## **Note 2 — Significant Accounting Policies**

### ***Basis of Presentation***

The Company’s financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America (“U.S. GAAP”), include all adjustments necessary for the fair presentation of the Company’s financial position for the periods presented and are stated in U.S. dollars. The Company has no subsidiaries.

### ***Use of Estimates***

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of expenses during the reporting period. Actual results could differ from those estimates.

**Cash and Cash Equivalents**

The Company considers all short-term investments with an original maturity of three months or less when purchased to be cash equivalents. Cash and cash equivalents at December 31, 2021 and 2020 consisted of cash, money market funds and certificates of deposit in institutions in the United States. Balances at certain institutions have exceeded Federal Deposit Insurance Corporation (“FDIC”) insured limits and U.S. government agency securities.

**Other Receivables – Related Party**

Other receivables consist of amounts due from Journey Medical Corporation (“Journey”), a consolidated entity under Fortress, and are recorded at the invoiced amount.

**Accounts Payable and Accrued Expenses – Related Party**

Accounts payable and accrued expenses consist of amounts due to Fortress, a related party, and are recorded at the invoiced amount.

**Research and Development**

Research and development costs are expensed as incurred. Advance payments for goods and services that will be used in future research and development activities are expensed when the activity has been performed or when the goods have been received rather than when the payment is made. Upfront and milestone payments due to third parties that perform research and development services on the Company’s behalf will be expensed as services are rendered or when the milestone is achieved.

Research and development costs primarily consist of personnel related expenses, including salaries, benefits, travel, and other related expenses, stock-based compensation, payments made to third parties for license and milestone costs related to in-licensed products and technology, payments made to third party contract research organizations for preclinical and clinical studies, investigative sites for clinical trials, consultants, the cost of acquiring and manufacturing clinical trial materials, costs associated with regulatory filings and patents, laboratory costs and other supplies.

Costs incurred in obtaining technology licenses are charged to research and development expense if the technology licensed has not reached commercial feasibility and have no alternative future use. The licenses purchased by the Company require substantial completion of research and development, regulatory and marketing approval efforts in order to reach commercial feasibility and has no alternative future use. Accordingly, the total purchase price including any development milestone payments for the licenses acquired are reflected as research and development — licenses acquired on the Company’s Statements of Operations.

**Annual Stock Dividend**

In September 2016, in connection with the Amended and Restated Articles of Incorporation, the Company issued 250,000 Class A preferred shares to Fortress. The Class A preferred shares entitled the holder to a stock dividend equal to 2.5% of the fully diluted outstanding equity of the Company (“The Annual Stock Dividend”) to be paid on February 17 of each year. On June 13, 2018, the Company’s Stockholders adopted an amendment to the Company’s Third Amended and Restated Certificate of Incorporation amending the payment date going forward to January 1 of each year. Concurrently with the execution and delivery of the SPMA, the Company, InvaGen and Fortress entered into a waiver agreement (“the Waiver Agreement”), pursuant to which, among other things, Fortress irrevocably waived its right to receive dividends of the Company’s common shares under the terms of the Class A Preferred Stock and any fees, payments, reimbursements or other distributions under a certain management services agreement between the Company and Fortress and the Founders Agreement (as defined in the SPMA), for the period November 12, 2018 to the termination of InvaGen’s rights under Section 4 of the Stockholders Agreement that was signed between the Company, certain stockholders of the Company, and InvaGen.

**Stock-Based Compensation**

The Company expenses stock-based compensation to its employees, consultants and board members over the requisite service period based on the estimated grant-date fair value of the awards. Stock-based awards with graded-vesting schedules are recognized on a straight-line basis over the requisite service period for each separately vesting portion of the award. The Company accounts for forfeitures as they occur.

The assumptions used in calculating the fair value of stock-based awards represent management’s best estimates and involve inherent uncertainties and the application of management’s judgment.

### Income Taxes

The Company accounts for income taxes under ASC 740, *Income Taxes* (“ASC 740”). ASC 740 requires the recognition of deferred tax assets and liabilities for both the expected impact of differences between the financial statement and tax basis of assets and liabilities and for the expected future tax benefit to be derived from tax loss and tax credit carry forwards. ASC 740 additionally requires a valuation allowance to be established when it is more likely than not that all or a portion of deferred tax assets will not be realized.

ASC 740 also clarifies the accounting for uncertainty in income taxes recognized in an enterprise’s financial statements and prescribes a recognition threshold and measurement process for financial statement recognition and measurement of a tax position taken or expected to be taken in a tax return. For those benefits to be recognized, a tax position must be more-likely-than-not to be sustained upon examination by taxing authorities. ASC 740 also provides guidance on de-recognition, classification, interest and penalties, accounting in interim period, disclosure and transition. Based on the Company’s evaluation, it has been concluded that there are no significant uncertain tax positions requiring recognition in the Company’s financial statements. The 2018 through 2020 tax years are the only periods subject to examination upon filing of appropriate tax returns. The Company believes that its income tax positions and deductions would be sustained on audit and does not anticipate any adjustments that would result in a material change to its financial position.

The Company’s policy for recording interest and penalties associated with audits is to record such expense as a component of income tax expense. There were no amounts accrued for penalties or interest as of or during the years ended December 31, 2021 and 2020. Management is currently unaware of any issues under review that could result in significant payments, accruals or material deviations from its position.

### Net Loss Per Share

Loss per share is computed by dividing net loss by the weighted-average number of common shares outstanding, excluding unvested restricted stock and stock options and preferred shares, during the period. Since dividends are declared paid and set aside among the holders of shares of common stock and Class A common stock pro-rata on an as-if-converted basis, the two-class method of computing net loss per share is not required.

The following table sets forth the potential common shares that could potentially dilute basic income per share in the future that were not included in the computation of diluted net loss per share because to do so would have been anti-dilutive for the periods presented:

	For the Years Ended	
	2021	2020
Unvested restricted stock units/awards	1,416,356	1,139,910
Preferred shares	250,000	250,000
<b>Total potential dilutive effect</b>	<b>1,666,356</b>	<b>1,389,910</b>

### Recently Adopted Accounting Standards

In December 2019, the Financial Accounting Standards Board (“FASB”) issued ASU No. 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes*, (“ASU 2019-12”) which is intended to simplify various aspects related to accounting for income taxes. ASU 2019-12 removes certain exceptions to the general principles in Topic 740 and also clarifies and amends existing guidance to improve consistent application. This guidance is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2020, with early adoption permitted. The Company adopted ASU 2019-12 on January 1, 2021 and its adoption did not have a material impact on the Company’s financial statements and related disclosures.

### Note 3 — License/Supplier Agreements

Effective as of February 17, 2015, Fortress transferred the Revogenex license and all other rights and obligations under the License Agreement to Avenue, pursuant to the terms of the Founders Agreement. In connection with the terms of the License Agreement, Fortress purchased an exclusive license to IV Tramadol for the U.S. market from Revogenex, a privately held company in Dublin, Ireland. Fortress made an upfront payment of \$2.0 million to Revogenex upon execution of the exclusive license, and on June 17, 2015, Fortress paid an additional \$1.0 million to Revogenex after receiving all the assets specified in the agreement. The \$3.0 million cumulative payment was included in research and development-licenses acquired in the statements of operations. In December 2019, \$1.0 million became due to Revogenex in accordance with the Company’s submission of its NDA. The amount was expensed in research and development-licenses acquired in the statement of operations for the year ended December 31, 2019 and subsequently paid in the first quarter of 2020. In addition, under the terms of the agreement, Revogenex is eligible to receive an additional milestone payment totaling \$3.0 million upon the approval of IV Tramadol from the FDA as well as royalty payments for sales of the product.

On October 29, 2018, the Company and Zakłady Farmaceutyczne Polpharma (“Polpharma”) extended the term of their exclusive supply agreement for drug product of IV Tramadol to eight years from the date of the launch of the product. In addition, under the terms of the amended agreement, Polpharma is eligible to receive a milestone payment totaling \$2.0 million upon the approval of IV Tramadol from the FDA, as well as royalty payments for sales of the product.

**Note 4 — Related Party Agreements**

***Founders Agreement and Management Services Agreement with Fortress***

Fortress entered into a Founders Agreement with Avenue in February 2015, pursuant to which Fortress assigned to Avenue all of its rights and interest under Fortress’s license agreement with Revogenex for IV Tramadol (the “License Agreement”). As consideration for the Founders Agreement, Avenue assumed \$3.0 million in debt that Fortress accumulated for expenses and costs of forming Avenue and obtaining the IV Tramadol license. This debt was repaid to Fortress in 2017. As additional consideration for the transfer of rights under the Founders Agreement, Avenue shall also: (i) issue annually to Fortress, on the anniversary date of the Founders Agreement, shares of common stock equal to two and one half percent (2.5%) of the fully-diluted outstanding equity of Avenue at the time of issuance; (ii) pay an equity fee in shares of Avenue common stock, payable within five (5) business days of the closing of any equity or debt financing for Avenue or any of its respective subsidiaries that occurs after the effective date of the Founders Agreement and ending on the date when Fortress no longer has majority voting control in Avenue’s voting equity, equal to two and one half percent (2.5%) of the gross amount of any such equity or debt financing; and (iii) pay a cash fee equal to four and one half percent (4.5%) of Avenue’s annual net sales, payable on an annual basis, within ninety (90) days of the end of each calendar year. In the event of a change in control (as it is defined in the Founders Agreement), Fortress will be paid a one-time change in control fee equal to five (5x) times the product of (i) net sales for the twelve (12) months immediately preceding the change in control and (ii) four and one-half percent (4.5%). This additional consideration was waived on November 12, 2018 with the Waiver Agreement signed between Avenue, Fortress and InvaGen.

On September 13, 2016, the Company entered into an Amended and Restated the Founders Agreement (“A&R Founders Agreement”) with Fortress. The A&R Founders Agreement eliminated the Annual Equity Fee in connection with the original agreement and added a term of 15 years, which upon expiration automatically renews for successive one-year periods unless terminated by Fortress or a Change in Control occurs. Concurrently with the A&R Founders Agreement the Company entered into an Exchange Agreement whereby the Company exchanged Fortress’ 2.3 million Class A common shares for approximately 2.5 million common shares and 250,000 Class A Preferred shares (see Note 7).

Effective as of February 17, 2015, Fortress entered into a Management Services Agreement (the “MSA”) with Avenue and each of Avenue’s current directors and officers who are directors or officers of Fortress, excluding services provided by Dr. Lucy Lu, the Company’s current Chief Executive Officer as of June 26, 2017 and the former Chief Financial Officer of Fortress (resigned as of June 26, 2017), to provide services to Avenue pursuant to the terms of the MSA. Pursuant to the terms of the MSA, for a period of five (5) years, Fortress will render advisory and consulting services to Avenue. Services provided under the MSA may include, without limitation, (i) advice and assistance concerning any and all aspects of Avenue’s operations, clinical trials, financial planning and strategic transactions and financings and (ii) conducting relations on behalf of Avenue with accountants, attorneys, financial advisors and other professionals (collectively, the “Services”). Avenue is obligated to utilize clinical research services, medical education, communication and marketing services and investor relations/public relation services of companies or individuals designated by Fortress, provided those services are offered at market prices. However, Avenue is not obligated to take or act upon any advice rendered from Fortress and Fortress shall not be liable for any of Avenue’s actions or inactions based upon their advice. Fortress and its affiliates, including all members of Avenue’s Board of Directors, have been contractually exempt from fiduciary duties to Avenue relating to corporate opportunities. In consideration for the Services, Avenue will pay Fortress an annual consulting fee of \$0.5 million (the “Annual Consulting Fee”), payable in advance in equal quarterly installments on the first business day of each calendar quarter in each year, provided, however, that such Annual Consulting Fee shall be increased to \$1.0 million for each calendar year in which Avenue has net assets in excess of \$100.0 million at the beginning of the calendar year. Effective November 12, 2018, the MSA fee was waived with the Waiver Agreement signed between Avenue, Fortress and InvaGen.



**Secondment Agreement with Journey**

Effective June 1, 2021, the Company, InvaGen, Fortress and Journey entered into a secondment agreement for a certain Avenue employee to be seconded to Journey. During the secondment, Journey had the authority to supervise the Avenue employee and will reimburse the Company for the employee's salary and salary-related costs. The term of this agreement lasted until the employee's services were needed again by the Company which was December 1, 2021. The amounts reimbursable to Avenue were \$0.2 million for the year ended December 31, 2021 and were recorded as a reduction in research and development expenses on the Company's statements of operations. The amount due to the Company as of December 31, 2021 that is related to this secondment agreement is \$90,000 and is included in "Other receivables – related party" on the Company's balance sheets.

**Note 5 — Accounts Payable and Accrued Expenses**

Accounts payable, accrued expenses and other liabilities consisted of the following (in thousands):

	As of December 31,	
	2021	2020
Accounts payable	\$ 304	\$ 143
Accrued employee compensation	24	23
Accrued contracted services and other	123	691
<b>Accounts payable and accrued expenses</b>	<b>\$ 451</b>	<b>\$ 857</b>

**Note 6 — Commitments and Contingencies**

**Leases**

The Company is not a party to any leases for office space or equipment.

**Litigation**

The Company recognizes a liability for a contingency when it is probable that liability has been incurred and when the amount of loss can be reasonably estimated. When a range of probable loss can be estimated, the Company accrues the most likely amount of such loss, and if such amount is not determinable, then the Company accrues the minimum of the range of probable loss. As of December 31, 2021 and 2020, there was no litigation against the Company.

**Note 7 — Stockholders' Equity**

**Class A Preferred Shares**

On September 13, 2016, the Class A Common Stock was eliminated and 2,000,000 shares of Preferred Stock were authorized, of which 250,000 have been designated as Class A Preferred Stock and the remainder are undesignated preferred stock. The Class A Preferred Stock, with a par value of \$0.0001 per share, is identical to undesignated Common Stock other than as to voting rights, conversion rights, and the PIK Dividend right (as described below). The undesignated Preferred Stock may be issued from time to time in one or more series. The Company's Board of Directors is authorized to determine or alter the dividend rights, dividend rate, conversion rights, voting rights, rights and terms of redemption (including sinking fund provisions, if any), the redemption price or prices, the liquidation preferences and other designations, powers, preferences and relative, participating, optional or other special rights, if any, and the qualifications, limitations and restrictions granted to or imposed upon any wholly unissued series of Preferred Stock, and to fix the number of shares of any series of Preferred Stock (but not below the number of shares of any such series then outstanding).

Pursuant to the Company's Second Amended and Restated Certificate of Incorporation, the holders of the outstanding shares of Class A Preferred Stock shall receive on each February 17 (each a "PIK Dividend Payment Date") after the original issuance date of the Class A Preferred Stock until the date all outstanding Class A Preferred Stock is converted into Common Stock or redeemed (and the purchase price is paid in full), pro rata per share dividends paid in additional fully paid and nonassessable shares of Common Stock (such dividend being herein called "PIK Dividends") such that the aggregate number of shares of Common Stock issued pursuant to such PIK Dividend is equal to two and one-half percent (2.5%) of the Corporation's fully-diluted outstanding capitalization on the date that is one (1) business day prior to any PIK Dividend Payment Date ("PIK Record Date"). In the event the Class A Preferred Stock converts into Common Stock, the holders shall receive all PIK Dividends accrued through the date of such conversion. No dividend or other distribution shall be paid, or declared and set apart for payment (other than dividends payable solely in capital stock on the capital stock of the Company) on the shares of Common Stock until all PIK Dividends on the Class A Preferred Stock shall have been paid or declared and set apart for payment. All dividends are non-cumulative. On June 13, 2018, the Company's Stockholders adopted an amendment to the Company's Third Amended and Restated Certificate of Incorporation amending the PIK Dividend Payment Date going forward to January 1 of each year. This PIK Dividend was waived in connection with the Waiver Agreement signed on November 12, 2018 between Avenue, Fortress and InvaGen.

On any matter presented to the stockholders of the Company for their action or consideration at any meeting of stockholders of the Company (or by written consent of stockholders in lieu of meeting), each holder of outstanding shares of Class A Preferred Stock shall be entitled to cast for each share of Class A Preferred Stock held by such holder as of the record date for determining stockholders entitled to vote on such matter, the number of votes that is equal to one and one-tenth (1.1) times a fraction, the numerator of which is the sum of (A) the number of shares of outstanding Common Stock and (B) the whole shares of Common Stock in to which the shares of outstanding Class A Common Stock and the Class A Preferred Stock are convertible, and the denominator of which is number of shares of outstanding Class A Preferred Stock (the "Class A Preferred Stock Ratio"). Thus, the Class A Preferred Stock will at all times constitute a voting majority.

Each share of Class A Preferred Stock is convertible, at the option of the holder, into one fully paid and nonassessable share of Common Stock (the "Conversion Ratio"), subject to certain adjustments. If the Company, at any time effects a subdivision or combination of the outstanding Common Stock (by any stock split, stock dividend, recapitalization, reverse stock split or otherwise), the applicable Conversion Ratio in effect immediately before that subdivision is proportionately decreased or increased, as applicable, so that the number of shares of Common Stock issuable on conversion of each share of Class A Preferred Stock shall be increased or decreased, as applicable, in proportion to such increase or decrease in the aggregate number of shares of Common Stock outstanding. Additionally, if any reorganization, recapitalization, reclassification, consolidation or merger involving the Company occurs in which the Common Stock (but not the Class A Preferred Stock) is converted into or exchanged for securities, cash or other property, then each share of Class A Preferred Stock becomes convertible into the kind and amount of securities, cash or other property which a holder of the number of shares of Common Stock of the Company issuable upon conversion of one share of the Class A Preferred Stock immediately prior to such reorganization, recapitalization, reclassification, consolidation or merger would have been entitled to receive pursuant to such transaction.

#### **Common Stock**

As of December 31, 2021, the Company's authorized capital stock consists of 50,000,000 shares of common stock, with \$0.0001 par value.

Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. An election of directors by our stockholders shall be determined by a plurality of the votes cast by the stockholders entitled to vote on the election. Holders of common stock are entitled to receive proportionately any dividends as may be declared by our Board of Directors, subject to any preferential dividend rights of outstanding preferred stock.

In the event of our liquidation or dissolution, the holders of common stock are entitled to receive proportionately all assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the prior rights of any outstanding preferred stock. Holders of common stock have no preemptive, subscription, redemption or conversion rights. The rights, preferences and privileges of holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

### Underwritten Public Offerings

In November 2021, the Company, pursuant to an underwritten public offering, sold 2,238,805 shares of its common stock at a price of \$1.34 per share for gross proceeds of approximately \$3.0 million. After deducting underwriting discounts and commissions and other expenses, net proceeds from this underwritten public offering were \$2.6 million.

In December 2021, the Company, pursuant to an underwritten public offering, sold 1,910,100 shares of its common stock at a price of \$1.07 per share for gross proceeds of approximately \$2.0 million. In addition, the Company granted the underwriters a 45-day option to purchase additional shares of common stock, representing up to 15% of the number of the shares, solely to cover over-allotments. This 45-day purchase option was not exercised. After deducting underwriting discounts and commissions and other expenses, net proceeds from this underwritten public offering were \$1.8 million.

### Equity Incentive Plan

The Company has in effect the 2015 Incentive Plan ("2015 Incentive Plan"). The 2015 Incentive Plan was adopted in January 2015 by our stockholders and an amendment to the plan to increase the number of authorized shares issuable to 4,000,000 shares was approved by our stockholders in December 2021. Under the 2015 Incentive Plan, the compensation committee of the Company's board of directors is authorized to grant stock-based awards to directors, officers, employees and consultants. The plan authorizes grants to issue up to 4,000,000 shares of authorized but unissued common stock and expires 10 years from adoption and limits the term of each option to no more than 10 years from the date of grant.

Total shares available for the issuance of stock-based awards under the Company's 2015 Incentive Plan was 1,827,336 shares at December 31, 2021.

### Restricted Stock Units and Restricted Stock Awards

The following table summarizes restricted stock unit and award activity for the year ended December 31, 2021:

	Number of Units and Awards	Weighted Average Grant Date Fair Value
Unvested balance at December 31, 2020	1,139,910	\$ 5.96
Granted	839,686	\$ 0.93
Forfeited	(437,586)	\$ 7.98
Vested	(125,654)	\$ 4.97
Unvested balance at December 31, 2021	<u>1,416,356</u>	<u>\$ 3.75</u>

For the years ended December 31, 2021, and 2020 stock-based compensation expenses associated with the amortization of restricted stock units and restricted stock awards for employees and non-employees were approximately \$0.4 million and \$0.7 million, respectively.

For the years ended December 31, 2021, and 2020, the weighted average grant date fair value of restricted stock units and awards granted was \$0.93 and \$10.99, respectively. For the years ended December 31, 2021, and 2020, the weighted average grant date fair value of restricted stock units and awards forfeited was \$7.98 and nil, respectively. The total fair value of restricted stock units and awards that vested during the years ended December 31, 2021, and 2020 was \$0.6 million and \$0.5 million, respectively.

At December 31, 2021, the Company had unrecognized stock-based compensation expense related to restricted stock units and restricted stock awards of \$0.7 million, which is expected to be recognized over the remaining weighted-average vesting period of 0.76 years. This amount does not include, as of December 31, 2021, 50,000 shares of restricted stock outstanding which are performance-based and vest upon achievement of certain corporate milestones. The expense is recognized over the vesting period of the award. Stock-based compensation for milestone awards will be measured and recorded if and when it is probable that the milestone will be achieved.

**Stock Warrants**

The following table summarizes the warrant activity for the year ended December 31, 2021:

	Warrants	Weighted Average Exercise Price	Aggregate Intrinsic Value (in thousands)
Outstanding, December 31, 2020	15,841	\$ 0.6315	\$ 84
Exercised	(890)	\$ 0.0001	—
Outstanding, December 31, 2021	<u>14,951</u>	<u>\$ 0.6691</u>	<u>\$ 11</u>

**Note 8 — Income Taxes**

The Company has accumulated net losses since inception and has not recorded an income tax provision or benefit during the years ended December 31, 2021 and 2020.

A reconciliation of the statutory U.S. federal rate to the Company's effective tax rate is as follows:

	For the years ended December 31,	
	2021	2020
Statutory federal income tax rate	21 %	21 %
State taxes, net of federal tax benefit	13 %	13 %
State tax rate change	0 %	0 %
Stock-based compensation	(11)%	6 %
Other	0 %	0 %
Credits	0 %	0 %
Change in valuation allowance	(23)%	(40)%
<b>Income taxes provision (benefit)</b>	<u>0 %</u>	<u>0 %</u>

The components of the net deferred tax asset as of December 31, 2021 and 2020 are the following (in thousands):

	As of December 31,	
	2021	2020
Deferred tax assets:		
Net operating loss carryovers	\$ 23,719	\$ 22,240
Stock compensation and other	293	760
Amortization of license	1,162	1,283
Accruals and reserves	6	16
Tax credits	2,640	2,640
Total deferred tax assets	<u>27,820</u>	<u>26,939</u>
Less valuation allowance	(27,820)	(26,939)
<b>Deferred tax assets, net of valuation allowance</b>	<u>\$ —</u>	<u>\$ —</u>

The Company has determined, based upon available evidence, that it is more likely than not that the net deferred tax asset will not be realized and, accordingly, has provided a full valuation allowance against it. A valuation allowance of approximately \$27.8 million and \$26.9 million was recorded for the years ended December 31, 2021 and 2020, respectively.

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As of December 31, 2021, the Company had federal and state net operating loss carryforwards of approximately \$71.2 million and \$134.4 million, respectively. Approximately \$56.7 million of the federal net operating loss carryforwards can be carried forward indefinitely. The remaining \$14.5 million of federal and all state net operating loss carryforwards will begin to expire, if not utilized, by 2034 and 2028, respectively. The Company has \$2.6 million of research and development credit carryforwards, which will begin to expire, if not utilized, in 2035. Utilization of the net operating loss and credit carryforwards may be subject to an annual limitation due to the ownership change limitations provided by Section 382 of the Internal Revenue Code of 1986. Certain tax attributes are subject to an annual limitation as a result of the Company's June 2017 initial public offering, which constitutes an ownership change under Section 382. Certain tax attributes may be subject to an annual limitation as a result of the SPMA with InvaGen, which could constitute an ownership change under Section 382.

There are no significant matters determined to be unrecognized tax benefits taken or expected to be taken in a tax return, in accordance with ASC 740, which clarifies the accounting for uncertainty in income taxes recognized in the financial statements, that have been recorded on the Company's financial statements for the periods ended December 31, 2021 and 2020. The Company does not anticipate a material change to unrecognized tax benefits in the next twelve months.

Additionally, ASC 740 provides guidance on the recognition of interest and penalties related to income taxes. There were no interest or penalties related to income taxes that have been accrued or recognized as of and for the periods ended December 31, 2021 and 2020.

The federal and state tax returns for the years ended December 31, 2018, 2019, and 2020 are currently open for examination under the applicable federal and state income tax statutes of limitations. The Company was under examination by New York City Department of Finance for tax years between 2017 and 2019. The examination was concluded in 2021 and did not result in material adjustments.

**SIGNATURES**

Pursuant to the requirements of Section 12 of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

**Avenue Therapeutics, Inc.**

By: /s/ Lucy Lu, M.D.  
Name: Lucy Lu, M.D.  
Title: President, Chief Executive Officer, Interim Chief Financial Officer, and Director  
March 25, 2022

**POWER OF ATTORNEY**

We, the undersigned directors and/or executive officers of Avenue Therapeutics, Inc., hereby severally constitute and appoint Lucy Lu, M.D., acting singly, his or her true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution, for him or her in any and all capacities, to sign this report and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent full power and authority to do and perform each and every act and thing necessary or appropriate to be done in connection therewith, as fully for all intents and purposes as he or she might or could do in person, hereby approving, ratifying and confirming all that said attorney-in-fact and agent, or his substitute, may lawfully do or cause to be done by virtue hereof.

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

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Lucy Lu, M.D.</u> Lucy Lu, M.D.	President, Chief Executive Officer, Interim Chief Financial Officer and Director (Principal Executive Officer) and (Principal Financial Officer)	March 25, 2022
<u>/s/ Lindsay A. Rosenwald, M.D.</u> Lindsay A. Rosenwald, M.D.	Executive Chairman of the Board	March 25, 2022
<u>/s/ Elizabeth Garrett Ingram</u> Elizabeth Garrett Ingram	Director	March 25, 2022
<u>/s/ Neil Herskowitz</u> Neil Herskowitz	Director	March 25, 2022
<u>/s/ Jaideep Gogtay, M.D., Ph.D.</u> Jaideep Gogtay, M.D., Ph.D.	Director	March 25, 2022
<u>/s/ Jay Kranzler, M.D., Ph.D.</u> Jay Kranzler, M.D., Ph.D.	Director	March 25, 2022
<u>/s/ Curtis Oltmans</u> Curtis Oltmans	Director	March 25, 2022

**DESCRIPTION OF THE REGISTRANT'S SECURITIES  
REGISTERED PURSUANT TO SECTION 12 OF THE  
SECURITIES EXCHANGE ACT OF 1934  
DESCRIPTION OF CAPITAL STOCK**

**Authorized Capital Stock**

Our authorized capital stock consists of 50,000,000 shares of common stock, with \$0.0001 par value, and 2,000,000 shares of Preferred Stock, with \$0.0001 par value, of which 250,000 have been designated as Class A Preferred Stock and the remainder of which are undesignated Preferred Stock.

As of March 21, 2022, there were 21,732,284 shares of our common stock outstanding held by 38 record stockholders.

**Common Stock**

Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. An election of directors by our stockholders shall be determined by a plurality of the votes cast by the stockholders entitled to vote on the election. Holders of common stock are entitled to receive proportionately any dividends as may be declared by our Board of Directors, subject to any preferential dividend rights of outstanding preferred stock.

In the event of our liquidation or dissolution, the holders of common stock are entitled to receive proportionately all assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the prior rights of any outstanding preferred stock. Holders of common stock have no preemptive, subscription, redemption or conversion rights. The rights, preferences and privileges of holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

Our common stock is traded on the Nasdaq Capital Market under the symbol "ATXI." The transfer agent and registrar for our common stock is VStock Transfer, LLC.

**DESCRIPTION OF PREFERRED STOCK**

**Class A Preferred Stock**

Class A Preferred Stock is identical to our common stock other than as to voting rights, the election of directors for a definite period, conversion rights and the PIK Dividend right (as described below). On any matter presented to our stockholders for their action or consideration at any meeting of our stockholders (or by written consent of stockholders in lieu of meeting), each holder of outstanding shares of Class A Preferred Stock will be entitled to cast for each share of Class A Preferred Stock held by such holder as of the record date for determining stockholders entitled to vote on such matter, the number of votes that is equal to one and one-tenth (1.1) times a fraction, the numerator of which is the sum of (A) the shares of outstanding common stock and (B) the whole shares of common stock in to which the shares of outstanding Class A Preferred Stock are convertible and the denominator of which is the number of shares of outstanding Class A Preferred Stock, or the Class A Preferred Stock Ratio. Thus, the Class A Preferred Stock will at all times constitute a voting majority.

For a period of ten years from the date of the first issuance of shares of Class A Preferred Stock, or the Class A Director Period, the holders of record of the shares of Class A Preferred Stock (or other capital stock or securities issued upon conversion of or in exchange for the Class A Preferred Stock), exclusively and as a separate class, shall be entitled to appoint or elect the majority of our directors, or the Class A Directors. Thus, the Class A Preferred Stock will be entitled to elect the majority of the Board of Directors during the Class A Director Period.

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The holders of the outstanding shares of Class A Preferred Stock shall receive on January 1 of each year, each a PIK Dividend Payment Date, after the original issuance date of the Class A Preferred Stock until the date all outstanding Class A Preferred Stock is converted into common stock or redeemed (and the purchase price is paid in full), pro rata per share dividends paid in additional fully paid and nonassessable shares of common stock, such dividend being herein called PIK Dividends, such that the aggregate number of shares of common stock issued pursuant to such PIK Dividend is equal to 2.5% of our fully-diluted outstanding capitalization on the date that is one business day prior to any PIK Dividend Payment Date, or PIK Record Date. In the event the Class A Preferred Stock converts into common stock, the holders shall receive all PIK Dividends accrued through the date of such conversion.

Each share of Class A Preferred Stock is convertible, at the option of the holder, into one fully paid and nonassessable share of common stock, or the Conversion Ratio, subject to certain adjustments.

#### **Undesignated Preferred Stock**

The undesignated Preferred Stock may be issued from time to time in one or more series. Our Board of Directors is authorized to determine or alter the dividend rights, dividend rate, conversion rights, voting rights, rights and terms of redemption (including sinking fund provisions, if any), the redemption price or prices, the liquidation preferences and other designations, powers, preferences and relative, participating, optional or other special rights, if any, and the qualifications, limitations and restrictions granted to or imposed upon any wholly unissued series of Preferred Stock, and to fix the number of shares of any series of Preferred Stock (but not below the number of shares of any such series then outstanding).

#### **DESCRIPTION OF WARRANTS**

We may issue warrants to purchase shares of our common stock and/or preferred stock in one or more series together with other securities or separately. As of March 21, 2022 there were 14,951 shares of common stock that may be issued upon exercise of outstanding warrants.

#### **DESCRIPTION OF DEBT SECURITIES**

We may offer debt securities which may be senior, subordinated or junior subordinated and may be convertible. The terms of the debt securities will include those stated in the indenture and those made part of the indenture by reference to the Trust Indenture Act of 1939, as in effect on the date of the indenture. We have filed a copy of the form of indenture as an exhibit to our Form S-3 Registration Statement on December 7, 2021. The indenture will be subject to and governed by the terms of the Trust Indenture Act of 1939.

#### **Debt Securities**

The aggregate principal amount of debt securities that may be issued under the indenture is unlimited. The debt securities may be issued in one or more series as may be authorized from time to time pursuant to a supplemental indenture entered into between us and the trustee or an order delivered by us to the trustee.

#### **General**

One or more series of debt securities may be sold as “original issue discount” securities. These debt securities would be sold at a substantial discount below their stated principal amount, bearing no interest or interest at a rate which at the time of issuance is below market rates. One or more series of debt securities may be variable rate debt securities that may be exchanged for fixed rate debt securities.

Debt securities may be issued where the amount of principal and/or interest payable is determined by reference to one or more currency exchange rates, commodity prices, equity indices or other factors. Holders of such debt securities may receive a principal amount or a payment of interest that is greater than or less than the amount of principal or interest otherwise payable on such dates, depending upon the value of the applicable currencies, commodities, equity indices or other factors.

The term “debt securities” includes debt securities denominated in U.S. dollars or, if specified in the applicable prospectus supplement, in any other freely transferable currency or units based on or relating to foreign currencies.

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## **Global Securities**

The debt securities of a series may be issued in whole or in part in the form of one or more global securities that will be deposited with, or on behalf of, a depository identified in the prospectus supplement. Global securities will be issued in registered form and in either temporary or definitive form. Unless and until it is exchanged in whole or in part for the individual debt securities, a global security may not be transferred except as a whole by the depository for such global security to a nominee of such depository or by a nominee of such depository to such depository or another nominee of such depository or by such depository or any such nominee to a successor of such depository or a nominee of such successor. The specific terms of the depository arrangement with respect to any debt securities of a series and the rights of and limitations upon owners of beneficial interests in a global security will be described in the applicable prospectus supplement.

## **Governing Law**

The indenture and the debt securities shall be construed in accordance with and governed by the laws of the State of New York.

## **DESCRIPTION OF UNITS**

We may issue, in one more series, units comprised of shares of our common stock and/or preferred stock, warrants to purchase common stock and/or preferred stock, debt securities or any combination of those securities. Each unit will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security. The unit agreement under which a unit is issued may provide that the securities included in the unit may not be held or transferred separately, at any time or at any time before a specified date.

We may evidence units by unit certificates that we issue under a separate agreement. We may issue the units under a unit agreement between us and one or more unit agents. If we elect to enter into a unit agreement with a unit agent, the unit agent will act solely as our agent in connection with the units and will not assume any obligation or relationship of agency or trust for or with any registered holders of units or beneficial owners of units. We will indicate the name and address and other information regarding the unit agent in the applicable prospectus supplement relating to a particular series of units if we elect to use a unit agent.

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**AVENUE THERAPEUTICS INC.**

**List of Subsidiaries**

Avenue Therapeutics, Inc. does not have any subsidiaries.

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Consent of Independent Registered Public Accounting Firm

Avenue Therapeutics, Inc.  
New York, NY

We hereby consent to the incorporation by reference in the Registration Statements on Form S-3 (No. 333-259850 and No. 333-261520) and Form S-8 (No. 333-219972 and No. 333-261710) of Avenue Therapeutics, Inc. of our report dated March 25, 2022, relating to the financial statements which appears in this Annual Report on Form 10-K. Our report contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

/s/ BDO USA, LLP

New York, NY  
March 25, 2022

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**Certification of  
Principal Executive Officer  
Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002**

I, Lucy Lu, M.D., certify that:

1. I have reviewed this Annual Report on Form 10-K of Avenue Therapeutics, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
  - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
  - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
  - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
  - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):
  - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
  - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ Lucy Lu, M.D.

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Lucy Lu, M.D.  
President, Chief Executive Officer, Interim Chief Financial Officer  
and Director  
(Principal Executive Officer)  
(Principal Financial Officer)  
March 25, 2022

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**Certification of  
Principal Financial Officer  
Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002**

I, Lucy Lu, certify that:

1. I have reviewed this Annual Report on Form 10-K of Avenue Therapeutics, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
  - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
  - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
  - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
  - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):
  - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
  - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ Lucy Lu

Lucy Lu, M.D.

President, Chief Executive Officer, Interim Chief Financial Officer  
and Director

(Principal Executive Officer)

(Principal Financial Officer)

March 25, 2022

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**Certification of  
Principal Executive Officer  
Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002**

I, Lucy Lu, M.D., Chief Executive Officer of Avenue Therapeutics, Inc. (the “Company”), in compliance with Section 906 of the Sarbanes-Oxley Act of 2002, hereby certify that, to the best of my knowledge, the Company’s Annual Report on Form 10-K for the period ended December 31, 2021 (the “Report”) filed with the Securities and Exchange Commission:

- Fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ Lucy Lu, M.D.

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Lucy Lu, M.D.

President, Chief Executive Officer, Interim Chief Financial Officer  
and Director

(Principal Executive Officer)

(Principal Financial Officer)

March 25, 2022

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**Certification of  
Principal Financial Officer  
Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002**

I, Lucy Lu, Principal Financial Officer of Avenue Therapeutics, Inc. (the "Company"), in compliance with Section 906 of the Sarbanes-Oxley Act of 2002, hereby certify that, to the best of my knowledge, the Company's Annual Report on Form 10-K for the period ended December 31, 2021 (the "Report") filed with the Securities and Exchange Commission:

- Fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ Lucy Lu

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Lucy Lu, M.D.

President, Chief Executive Officer, Interim Chief Financial Officer  
and Director

(Principal Executive Officer)

(Principal Financial Officer)

March 25, 2022

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