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

FORM 10-K

[X] Annual Report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

For the fiscal year ended December 31, 2020

OR

[ ] Transition Report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

Commission file number 1-16467

RespireRx Pharmaceuticals Inc.
(Exact name of registrant as specified in its charter)

Delaware	**33-0303583**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification Number)**

126 Valley Road, Suite C
Glen Rock, New Jersey 07452
(Address of principal executive offices, including zip code)

(201) 444-4947
(Registrant's telephone number, including area code)

Securities registered under Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
N/A	N/A	N/A

Securities registered under Section 12(g) of the Act:
Common Stock, $0.001 par value
(Title of Class)

Indicate by check mark whether the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. YES [ ] NO [X]

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange Act. YES [ ] NO [X]

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 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 [X] NO [ ]

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

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

Large accelerated filer [ ]	Accelerated filer [ ]	Non-accelerated filer [X]	Smaller reporting company [X]	Emerging growth company [ ]

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

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

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

The aggregate market value of the voting stock held by non-affiliates as of June 30, 2020 was approximately $1,300,112 (based on the closing sale price of the common stock as reported by the OTC QB) on June 30, 2020.

As of April 13, 2021, there were 89,496,596 shares of the registrant's common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE: NONE

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In this Annual Report on Form 10-K, the terms "RespireRx," the "Company," "we," "us" and "our" refer to RespireRx Pharmaceuticals Inc. a Delaware corporation, and, unless the context indicates otherwise, its consolidated subsidiaries.

INTRODUCTORY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K of RespireRx Pharmaceuticals Inc. ("RespireRx" and together with RespireRx's wholly owned subsidiary, Pier Pharmaceuticals, Inc. ("Pier"), the "Company, "we," or "our," unless the context indicates otherwise) contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act") and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the Company intends that such forward-looking statements be subject to the safe harbor created thereby. These might include statements regarding the Company's future plans, targets, estimates, assumptions, financial position, business strategy and other plans and objectives for future operations, and assumptions and predictions about research and development efforts, including, but not limited to, preclinical and clinical research design, execution, timing, costs and results, future product demand, supply, manufacturing, costs, marketing and pricing factors.

In some cases, forward-looking statements may be identified by words including "assumes," "could," "ongoing," "potential," "predicts," "projects," "should," "will," "would," "anticipates," "believes," "intends," "estimates," "expects," "plans," "contemplates," "targets," "continues," "budgets," "may," or the negative of these terms or other comparable terminology, although not all forward-looking statements contain these words, and such statements may include, but are not limited to, statements regarding (i) future research plans, expenditures and results, (ii) potential collaborative arrangements, (iii) the potential utility of the Company's products candidates, (iv) reorganization plans, and (v) the need for, and availability of, additional financing. Forward-looking statements are based on information available at the time the statements are made and involve known and unknown risks, uncertainties and other factors that may cause our results, levels of activity, performance or achievements to be materially different from the information expressed or implied by the forward-looking statements in this report.

You should read these risk factors and the other cautionary statements made in the Company's filings as being applicable to all related forward-looking statements wherever they appear in this report. We cannot assure you that the forward-looking statements in this report will prove to be accurate and therefore prospective investors are encouraged not to place undue reliance on forward-looking statements. You should read this report completely. Other than as required by law, we undertake no obligation to update or revise these forward-looking statements, even though our situation may change in the future.

We caution investors not to place undue reliance on any forward-looking statement that speaks only as of the date made and to recognize that forward-looking statements are predictions of future results, which may not occur as anticipated. Actual results could differ materially from those anticipated in the forward-looking statements and from historical results, due to the risks and uncertainties described in this report, as well as others that we may consider immaterial or do not anticipate at this time. These forward-looking statements are based on assumptions regarding the Company's business and technology, which involve judgments with respect to, among other things, future scientific, economic, regulatory and competitive conditions, collaborations with third parties, and future business decisions, all of which are difficult or impossible to predict accurately and many of which are beyond the Company's control. Although we believe that the expectations reflected in our forward-looking statements are reasonable, we do not know whether our expectations will prove correct. Our expectations reflected in our forward-looking statements can be affected by inaccurate assumptions that we might make or by known or unknown risks and uncertainties, including those described in this report. These risks and uncertainties are not exclusive and further information concerning us and our business, including factors that potentially could materially affect our financial results or condition, may emerge from time to time.

For more information about the risks and uncertainties the Company faces, see "Item 1A. Risk Factors." Forward-looking statements speak only as of the date they are made. The Company does not undertake and specifically declines any obligation to update any forward-looking statements or to publicly announce the results of any revisions to any statements to reflect new information or future events or developments. We advise investors to consult any further disclosures we may make on related subjects in our annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K that we file with or furnish to the SEC.

PART I

Item 1. Business

The Company was incorporated in Delaware in 1987 as Cortex Pharmaceuticals, Inc. and change its name to RespireRx Pharmaceuticals Inc. in 2015.

The mission of the Company is to develop innovative and revolutionary treatments to combat disorders caused by disruption of neuronal signaling. We are developing treatment options that address obstructive sleep apnea ("OSA"), attention deficit hyperactivity disorder ("ADHD") epilepsy, chronic pain, including inflammatory and neuropathic pain, and recovery from spinal cord injury ("SCI"), which are conditions that affect millions of people but for which there are limited or poor treatment options. We are also developing treatment options for other conditions based on results of animal studies to date.

RespireRx is developing a pipeline of new drug products supported by our broad patent portfolios across two distinct drug platforms:

(i) our pharmaceutical cannabinoids platform (which we refer to as ResolutionRx), which includes dronabinol (a synthetic form of Δ9-tetrahydrocannabinol ("Δ9-THC")), which acts upon the nervous system's endogenous cannabinoid receptors, and

(ii) our neuromodulators platform (which we refer to as EndeavourRx) comprising two programs: (a) our AMPAkines program, including proprietary compounds that are positive allosteric modulators ("PAMs") of AMPA-type glutamate receptors to promote neuronal function and (b) our GABAkines program, including proprietary compounds that are PAMs of $GABA_A$ receptors, which program was recently established pursuant to our entry with the University of Wisconsin-Milwaukee Research Foundation, Inc., an affiliate of the University of Wisconsin-Milwaukee ("UWMRF"), into a patent license agreement (the UWMRF Patent License Agreement").

In order to facilitate our business activities and product development, we have organized our drug platforms into two separate business units. The business unit focused on pharmaceutical cannabinoids is referred to as ResolutionRx and the business unit focused on neuromodulators is referred to as EndeavourRx. It is anticipated that the Company will use, at least initially, its management personnel to provide management, operational and oversight services to these two business units.

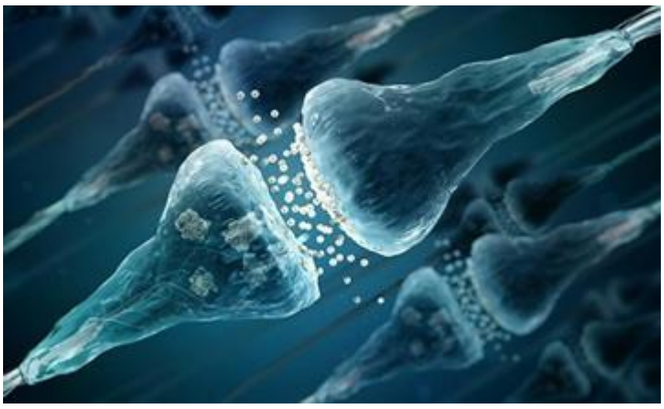
Management intends to organize our ResolutionRx and EndeavourRx business units into two subsidiaries: (i) a ResolutionRx subsidiary, into which we would contribute our pharmaceutical cannabinoid platform and its related tangible and intangible assets and certain of its liabilities and (ii) an EndeavourRx subsidiary, into which we would contribute our neuromodulator platform, including both the AMPAkine and GABAkine programs and their related tangible and intangible assets and certain of their liabilities.

Management believes that there are advantages to separating these platforms formally into newly formed subsidiaries, including but not limited to optimizing their asset values through separate financing channels and making them more attractive for capital raising as well as for strategic transactions.

The Company is also engaged in a number of business development efforts (licensing/sub-licensing, joint venture and other commercial structures) with a view to securing strategic partnerships that represent strategic and operational infrastructure additions, as well as cash and in-kind funding opportunities. These efforts have focused on, but have not been limited to, transacting with brand and generic pharmaceutical and biopharmaceutical companies as well as companies with potentially useful formulation or manufacturing capabilities, significant subject matter expertise and financial resources. No assurance can be given that any transaction will come to fruition and that if it does, that the terms will be favorable to the Company.

Neurotransmission

RespireRx is developing drugs to modify neurotransmission and create advanced treatments for disorders with high unmet needs. Neurotransmission is the basic process in the brain by which specialized nerve cells called neurons communicate information with each other.



As illustrated in this figure, during neurotransmission, neurons release chemicals called neurotransmitters which attach to receptors, very specific protein structures residing on adjacent neurons. This enables neurons to communicate with one another by either increasing or decreasing the excitability of the neuron receiving the communication. For example, glutamate is the primary excitatory neurotransmitter in the brain, while gamma-amino-butyric acid ("GABA") is the primary inhibitory neurotransmitter. Neurons also contain receptors for the brain's own natural cannabinoid (endocannabinoid) substances.

ResolutionRx – Pharmaceutical Cannabinoids

Background

Cannabinoids are pharmacologically active substances found within the marijuana plant. Due to the liberalization of state laws regulating the use and sales of marijuana over the last 5 years, a major industry has grown around the commercialization of marijuana for both medical and recreational use. However, while personal marijuana use has been legalized in certain states, it still is not legal under federal statutes and regulations. The medical use of any pharmacological agent must be approved by the U.S Food and Drug Administration ("FDA") and, to date, the FDA has not recognized or approved the marijuana plant as medicine nor is it federally legal to sell products that contain cannabinoids as drugs or dietary supplements without its approval.

Worldwide clinical research efforts have established the cannabinoid class of compounds as *bona fide* pharmaceutical products, or "pharmaceutical cannabinoids," which are being developed and commercialized according to FDA regulatory and industry guidelines. Scientific research and commercial development to date has focused primarily on two major cannabinoids, Δ9-THC and cannabidiol ("CBD"). This research and development began in 1985 when dronabinol, a synthetic form of Δ9-THC, was approved as Marinol® by the FDA for the treatment of AIDS-related anorexia and later for the treatment of chemotherapy-induced nausea and vomiting. Dronabinol, in its Marinol® formulation as well as numerous generic formulations, is available in 2.5 mg, 5 mg, and 10 mg capsules, with a maximum labelled dosage of 20 mg/day for the AIDS indication, or 15 mg/m^2 per dose for chemotherapy-induced nausea and vomiting.

One breakthrough subsequently led to the 2018 FDA approval of Epidiolex®, a proprietary oral solution of highly purified, plant-derived CBD sold by GW Pharmaceuticals plc ("GW Pharma") for the treatment of certain rare, treatment-resistant forms of epilepsy. Nabiximol®, an oromucosal spray containing Δ9-THC and CBD, was approved under the tradename Sativex® by applicable regulatory authorities in 29 countries outside the United States and is marketed and distributed by GW Pharmaceuticals plc ("GW") (on February 3, 2021, GW and Jazz Pharmaceuticals plc ("Jazz") announced a definitive agreement pursuant to which Jazz would acquire GW) in those countries for the treatment of multiple sclerosis.

The commercialization of these pharmaceutical cannabinoids has opened the door to an expanding market sector. As part of our effort to capitalize upon this opportunity, the Company has implemented an internal restructuring plan by forming ResolutionRx as a business unit focused on the pharmaceutical cannabinoid market. ResolutionRx's initial primary focus has been and will continue to be the re-purposing of dronabinol using new proprietary formulations and therapeutic indications. Because dronabinol already is an approved drug, we intend to use publicly available information, particularly safety data, in support of a 505(b)(2) New Drug Application ("NDA"), a potentially more rapid route to FDA approval than a standard 505(b)(1) NDA.

Obstructive Sleep Apnea (OSA)

The Company is developing dronabinol for the treatment of OSA, a sleep-related breathing disorder that afflicts an estimated 29 million people in the United States according to the American Academy of Sleep Medicine ("AASM"), and an additional 26 million in Germany and 8 million in the United Kingdom, as presented at the European Respiratory Society's annual Congress in Paris, France in September 2018. OSA involves a decrease or complete halt in airflow despite an ongoing effort to breathe during sleep. When the muscles relax during sleep, soft tissue in the back of the throat collapses and obstructs the upper airway. OSA remains significantly under-recognized, as only 20% of cases in the United States according to the AASM and 20% of cases globally have been properly diagnosed. About 24 percent of adult men and 9 percent of adult women are believed to have the breathing symptoms of OSA with or without daytime sleepiness. OSA significantly impacts the lives of sufferers who do not get enough sleep; their quality of sleep is deteriorated such that daily function is compromised and limited. OSA is associated with decreased quality of life, significant functional impairment, and increased risk of road traffic accidents, especially in professions like road and rail transportation and shipping.

Research has established links between OSA and several important co-morbidities, including hypertension, type II diabetes, obesity, stroke, congestive heart failure, coronary artery disease, cardiac arrhythmias, and even early mortality. The consequences of undiagnosed and untreated OSA are medically serious and economically costly. According to the AASM, the estimated economic burden of OSA in the United States is approximately $162 billion annually. All current treatment options have serious drawbacks. We believe that a new drug therapy that is effective in reducing the medical and economic burden of OSA would have major benefits for the treatment of this costly disease indication.

Continuous Positive Airway Pressure ("CPAP") is the most common treatment for OSA. CPAP devices work by blowing pressurized air into the nose (or mouth and nose), which keeps the pharyngeal airway open. Patients must use the device whenever they sleep. Reduction of the apnea-hypopnea index ("AHI") is the standard objective measure of therapeutic response in OSA. Apnea is the cessation of breathing for 10 seconds or more and hypopnea is a reduction in breathing. AHI is the sum of apnea and hypopnea events per hour. In the sleep laboratory, CPAP is highly effective at reducing AHI. However, the device is cumbersome and difficult for many patients to tolerate. Most studies describe that 25-50% of patients refuse to initiate or completely discontinue CPAP use within the first several months and that most patients who continue to use the device do so only intermittently.

Oral devices may be an option for patients who cannot tolerate CPAP. Several dental devices are available. The cost of these devices tends to be high and side effects associated with them include night-time pain, dry lips, tooth discomfort, and excessive salivation.

Patients with clinically significant OSA who cannot be treated adequately with CPAP or oral devices may elect to undergo surgery, the most common form of which involves the removal of excess tissue in the throat to make the airway wider. Patients who undergo surgery for the treatment of OSA risk complications. Surgery is often unsuccessful, and at present, no method exists to reliably predict therapeutic outcome from surgery.

In 2014 another surgical option became available based on upper airway stimulation. It is a combination of an implantable nerve stimulator and an external remote controlled by the patient. The implanted device stimulates the hypoglossal nerve, which controls the tongue, with every attempted breath, regardless of whether such stimulation is needed for that breath. The device is turned on at night and off in the morning by the patient with the remote.

The Company's Research Efforts Regarding the Treatment of OSA with Cannabinoids

The Company conducted a 21-day, randomized, double-blind, placebo-controlled, dose escalation Phase 2A clinical study in 22 patients with OSA, in which FDA approved and commercially available dronabinol produced a statistically significant reduction in AHI, the primary therapeutic end-point, and was observed to be safe and well tolerated, with the frequency of side effects no different from placebo. This clinical trial provided data supporting the submission of patent applications claiming unique dosage strengths, blood levels and controlled release formulations optimized for use in the treatment of OSA. If approved, these pending patents would extend market exclusivity until January 2042.

With approximately $5 million in funding from the National Heart, Lung and Blood Institute of the National Institutes of Health ("NIH"), Dr. David Carley of the University of Illinois at Chicago ("UIC"), along with his colleagues at UIC and Northwestern University, completed a Phase 2B multi-center, double-blind, placebo-controlled clinical trial of FDA approved and commercially available dronabinol in patients with OSA. This study, named "Pharmacotherapy of Apnea with Cannabimimetic Enhancement" ("PACE") replicated our earlier Phase 2A study. The authors published in January 2018 in the journal SLEEP and reported that, in a dose-dependent fashion, treatment with 2.5 mg and 10 mg of dronabinol once per day at night, significantly reduced, compared to placebo, AHI during sleep in 56 evaluable patients with moderate to severe OSA who completed the study. Additionally, treatment with 10 mg of dronabinol significantly improved daytime sleepiness as measured by the Epworth Sleepiness Scale and achieved the greatest overall patient satisfaction. As in our previous Phase 2A study, dronabinol was observed to be safe and well tolerated, with the frequency of side effects no different from placebo. The Company did not manage this clinical trial, which was funded entirely by the National Heart, Lung and Blood Institute of NIH.

The Opportunity to Improve Dronabinol Formulations

Dronabinol is currently marketed as a soft gelatin capsule that suffers from several major deficiencies.

First, dronabinol exhibits poor and erratic absorption. Δ9-THC is not water soluble. The market-dominant commercial gel cap formulation of dronabinol is currently formulated as a sesame oil-based liquid within a soft gelatin capsule. The absorption of dronabinol after oral administration is poor and highly variable with some patients achieving very high levels and others achieving very low levels. This erratic absorption may be responsible for the variable therapeutic responses observed in dronabinol clinical trials. Syndros®, on the other hand, is formulated as a solution in dehydrated alcohol, polyethylene glycol and other materials and exhibits its own challenges and deficiencies, including but not limited to it being classified as a Schedule II drug by the U.S. Drug Enforcement Administration (the "DEA") as compared to the capsule formulation that is classified as a Schedule III drug.

Second, dronabinol is rapidly and extensively (approximately 80%) metabolized upon first pass through the liver, resulting in low blood levels. Additionally, dronabinol has a relatively short half-life (approximately 3 – 4 hours) and, in its present formulation, is not optimally suited for therapeutic indications requiring blood levels to be sustained for 6 hours or longer.

Third, in order to achieve sustained, therapeutic blood levels, we have found it necessary to use higher doses of dronabinol in our OSA clinical trials. For example, over an 8-hour period, the 2.5 mg and 10 mg doses produced therapeutically equivalent effects during the first 4 hours, but only the 10 mg dose produced therapeutic effects during the second 4 hours. Unfortunately, the 10 mg dose produces a higher occurrence of side effects than the 2.5 mg dose (as described in the Marinol® package insert). We are currently focusing on new formulations that would achieve the blood levels produced by the lower doses for a sustained time period, resulting in the desired therapeutic effect(s) while minimizing undesirable side effects.

The Company's Cannabinoid Intellectual Property Rights

In order to expand RespireRx's respiratory disorders program and develop cannabinoids for the treatment of OSA, RespireRx acquired 100% of the issued and outstanding equity securities of Pier Pharmaceuticals, Inc. ("Pier") effective August 10, 2012 pursuant to an Agreement and Plan of Merger. Pier was a clinical stage pharmaceutical company developing a pharmacologic treatment for OSA and had been engaged in research and clinical development activities.

Through the merger, RespireRx gained access to an Exclusive License Agreement (as amended, the "2007 License Agreement") that Pier had entered into with UIC on October 10, 2007. The 2007 License Agreement covered certain patents and patent applications in the United States and other countries claiming the use of certain compounds referred to as cannabinoids, of which dronabinol is a specific example, for the treatment of sleep-related breathing disorders, including sleep apnea.

The 2007 License Agreement was terminated effective March 21, 2013 and the Company entered into a new license agreement (the "2014 License Agreement") with UIC on June 27, 2014, the material terms of which were substantially similar to the 2007 License Agreement. The 2014 License Agreement grants the Company, among other provisions, exclusive rights: (i) to practice certain patents in the United States, Germany and the United Kingdom, as defined in the 2014 License Agreement, that are held by UIC; (ii) to identify, develop, make, have made, import, export, lease, sell, have sold or offer for sale any related licensed products; and (iii) to grant sub-licenses of the rights granted in the 2014 License Agreement, subject to the provisions of the 2014 License Agreement.

The 2014 License Agreement obligates the Company to pay UIC a license fee, royalties, patent costs and certain milestones. Royalty payments include a royalty on net sales of 4%, payment on sub-licensee revenues of 12.5%, and a minimum annual royalty beginning in 2015 of $100,000, which is due and payable on December 31 of each year beginning on December 31, 2015. The due date of the minimum annual royalty obligation of $100,000 originally due on December 31, 2020, was extended to April 19, 2021 and was paid on April 1, 2021. One-time milestone payments may become due based upon the achievement of certain development milestones. $350,000 will be due within five days after the dosing of the first patient in a Phase III human clinical trial anywhere in the world. $500,000 will be due within five days after the first NDA filing with the FDA, as defined below, or a foreign equivalent. $1,000,000 will be due within twelve months of the first commercial sale. One-time and annual royalty payments may also become due and payable. In the year after the first application for market approval is submitted to the FDA or a foreign equivalent and until approval is obtained, the minimum annual royalty will increase to $150,000. In the year after the first market approval is obtained from the FDA or a foreign equivalent and until the first sale of a product, the minimum annual royalty will increase to $200,000. In the year after the first commercial sale of a product, the minimum annual royalty will increase to $250,000. For each of the fiscal years ended December 31, 2020 and 2019, the Company recorded a charge to operations of $100,000 as its minimum annual royalty obligation, which is included in research and development expenses in the Company's consolidated statements of operations for the fiscal years ended December 31, 2020 and 2019, respectively.

RespireRx has exclusive rights to issued and pending patents claiming cannabinoid compositions and methods for treating cannabinoid-sensitive disorders, including sleep apnea, pain, glaucoma, muscular spasticity, anorexia and other conditions. In October 2019, we filed a continuation-in-part for our pending patent that describes and claims novel doses, controlled release compositions and methods of use for cannabinoids, and in January 2021, a provisional patent application further disclosing novel dosage and controlled release compositions and methods of use for cannabinoids, alone or in combination, including with cannabinoid and non-cannabinoid molecules. Specific claims describe low dosage strengths and controlled release formulations for attaining a therapeutic window of cannabinoid blood levels that produce the desired therapeutic effect(s) for a controlled period of time, while minimizing undesirable side effects. Certain original patents were filed by RespireRx and are now included in the 2014 License Agreement. See Note 9. Commitments and Contingencies—*University of Illinois 2014 Exclusive License Agreement* in the notes to our consolidated financial statements as of December 31, 2020 for more information on the 2014 License Agreement. While no assurance can be provided that the claims in this continuation-in-part or the U.S. provisional patent application will be allowed in whole or in part, or that the patents will ultimately issue, we believe that these new filings, if allowed, will provide market protections through January 2042.

We believe our intellectual property initiatives may afford expanding strategic options and market exclusivity in the burgeoning pharmaceutical cannabinoid business sector. New cannabinoid formulation technology, including nano- and micro-emulsions and thin films, have been shown to bypass the normal route of absorption and liver metabolism of cannabinoids, thus dramatically increasing blood levels and allowing for the use of low doses. Similarly, technologies may be used to achieve a controlled release of dronabinol, and we believe that our pending patent priority relating back to 2010 predates the efforts of others seeking to develop low-dose or controlled or extended release formulations of cannabinoids.

Data from our Phase 2 clinical trials has allowed us to design new proprietary formulations of dronabinol, disclosed in our patent filings and optimized for the treatment of not only OSA, but also other indications. In support of this formulation program, David Dickason joined the Company as Senior Vice-President Preclinical Product Development on September 15, 2020. Mr. Dickason has an extensive background in product formulation development. In laboratory studies, he has generated data confirming the potential for the creation of a proprietary dronabinol formulation with optimized dose and duration of action for treating OSA. If successful in our development efforts, we believe that the development of a proprietary formulation of dronabinol for RespireRx based on our pending patents for low-dose and extended release dronabinol could lead to the development of a marketable proprietary formulation of dronabinol. We also believe that the development of a novel, proprietary formulation of dronabinol would only extend time to market entry by approximately 12 months compared to the market entry with a currently available generic soft gel capsule but would increase market value and extend market exclusivity given the anticipated new patents and our belief that certain strategic partners would be more interested in a proprietary formulation than an existing one; however, no assurance can be provided that any of the formulation technologies that we are currently analyzing will result in viable products.

Proposed Regulatory Approach for Dronabinol

In conjunction with its management and consultants, the Company intends to file a new NDA under Section 505(b)(2) of the Federal Food, Drug and Cosmetic Act (as amended, the "FDCA" and such NDA a "505(b)(2) NDA"), claiming the efficacy and safety of our proposed proprietary dronabinol formulation in the treatment of OSA. We believe the use of dronabinol for the treatment of OSA is a novel indication for an already approved drug, making it eligible for a 505(b)(2) NDA, as opposed to the submission and approval of a full 505(b)(1) NDA.

The 505(b)(2) NDA was created by the Hatch-Waxman Act, as amended (the "Hatch-Waxman Act"), which amended the FDCA to help avoid unnecessary duplication of studies already performed on a previously approved drug. As amended, the FDCA gives the FDA express permission to rely on data not developed by the NDA applicant. Accordingly, a 505(b)(2) NDA contains full safety and effectiveness reports but allows at least some of the information required for NDA approval, such as safety and efficacy information about the active ingredient, to come from studies not conducted by or for the applicant. This can result in a less expensive and faster route to approval, compared with a traditional development path, such as 505(b)(1), while still allowing for the creation of new, differentiated products. The 505(b)(2) NDA regulatory path offers the applicant market protections, such as market exclusivity, under the Hatch-Waxman Act and the rules promulgated thereunder. Other, international regulatory routes are available to pursue proprietary formulations of dronabinol and would provide further market protections. For example, in Europe, a regulatory approval route similar to the 505(b)(2) pathway is the hybrid procedure based on Article 10 of Directive 2001/83/EC.

We have worked with regulatory consultants who will assist with FDA filings and regulatory strategy. If we can secure sufficient financing, of which no assurance can be provided, we anticipate requesting a pre-IND (pre-Investigational New Drug application) meeting with the FDA. This meeting also could create the type of dialogue with the FDA that is normally communicated at an end-of-Phase 2 meeting. The FDA responses to this meeting will be incorporated into an IND.

If we can secure sufficient financing and successfully create a proprietary formulation of Δ9-THC, of which no assurance can be provided, we plan to propose conducting the appropriate clinical studies with our proprietary controlled release formulation in OSA patients to determine safety, pharmacokinetics ("PK") and efficacy, as well as a standard Phase 1 clinical study to determine potential abuse liability. When a Phase 3 study is required for a 505(b)(2), usually only one study with fewer patients is necessary versus the two, large scale, confirmatory studies generally required for the standard 505(b)(1) NDA. While no assurance can be provided, with an extensive safety database tracking chronic, long-term use of Marinol® and generics, we believe that the FDA should not have major safety concerns with dronabinol in the treatment of OSA.

The Company has worked with the investigators who conducted the Phase 2B clinical trial and our Clinical Advisory Panel to design a draft Phase 3 protocol that, based on the experience and results from the Phase 2A and Phase 2B trials, we believe will provide sufficient data for FDA approval of a RespireRx dronabinol controlled release formulation for OSA. The current version of the protocol is designed as a 90-day randomized, blinded, placebo-controlled study of dronabinol in the treatment of OSA. Depending on feedback from the FDA, the Company estimates that the Phase 3 trial would require between 120 and 300 patients at 15 to 20 sites, and take 18 to 24 months to complete, at a cost of between $10 million and $14 million.

We believe our rights under the Purisys Agreement would help facilitate regulatory approval. See "Information with Respect to our Company—Description of Business—*Manufacturing*" for information on the Purisys Agreement. Under the Purisys Agreement, Purisys has agreed to (i) provide all of the API estimated to be needed for the clinical development process for first- and second-generation products, three validation batches for NDA filings and adequate supply for the initial inventory stocking for the wholesale and retail channels, subject to certain limitations, (ii) maintain or file valid DMFs with the FDA or any other regulatory authority and provide the Company with access or a right of reference letter entitling the Company to make continuing reference to the DMFs during the term of the agreement in connection with any regulatory filings made with the FDA by the Company, (iii) participate on a development committee, and (iv) make available its regulatory consultants, collaborate with any regulatory consulting firms engaged by the Company and participate in all FDA or DEA meetings as appropriate and as related to the API.

In consideration for these supplies and services, the Company has agreed to (i) purchase exclusively from Purisys, during the commercialization phase, all API for these products at a pre-determined price subject to certain producer price adjustments and (ii) allow Purisys's participation in the economic success of the commercialized products up to the earlier of the achievement of a maximum dollar amount or the expiration of a period of time.

Large Commercial Opportunity

As a serious public health issue, the important need for diagnosing and ultimately treating OSA has recently been highlighted by the FDA clearance of several sleep apnea home test kits that are now third party reimbursed. Further highlighting this need, CVS Health Corporation (NYSE: CVS) announced the implementation of a program to diagnose and treat OSA initially within its own in-store, walk-in MinuteClinics. If implemented throughout its HealthHUB store network, we expect the number of people diagnosed with sleep apnea and eligible for treatment to increase dramatically. Fitbit, Inc., (NYSE: FIT), a health oriented smart watch company is seeking clearance from the FDA to diagnose sleep apnea. We believe that the combination of more efficient and patient friendly diagnostic procedures and, ultimately, pharmaceutical treatments such as those we are developing will encourage more patients to seek diagnosis and treatment. As noted above, there are approximately 29 million OSA patients in the United States and an additional 26 million in Germany and 8 million in the United Kingdom. There are currently no drugs approved for the treatment of OSA.

EndeavourRx – Neuromodulators

Background

As described above, during the neurotransmission process, neurons release neurotransmitters that attach to specific receptors residing on adjacent neurons, enabling them to communicate with one another and produce excitatory or inhibitory effects. For example, glutamate is the primary excitatory neurotransmitter in the brain and GABA is the primary inhibitory neurotransmitter. While the neurotransmitter attachment site on each of these receptors does not change, the receptor protein subunit structures can vary so that the receptors can produce a variety of effects. With the AMPA glutamate receptor, the binding of glutamate or an artificial agonist to its attachment site causes a change in the structure of the AMPA receptor resulting in an influx of cations and an increased excitability. Likewise, in the case of the $GABA_A$ receptor, the binding of GABA or an artificial agonist to its attachment site causes a change in the structure of the $GABA_A$ receptor ion channel and increases the flow of chloride ions (negatively charged anion) into the cell, resulting in a decreased excitability.

Neurotransmitter receptor proteins also may contain auxiliary "allosteric" binding sites, which are located adjacent to the agonist binding sites at which neurotransmitters act. Unlike neurotransmitters, neuromodulators are drugs that act at these allosteric binding sites rather than directly at the agonist binding site. They can act either as PAMs, which enhance, or as negative allosteric modulators ("NAMs"), which reduce, the actions of neurotransmitters at their primary receptor sites. Neuromodulators have no intrinsic activity of their own. We have coined the terms "AMPAkines" and "GABAkines" to refer to drugs that act as PAMs at the AMPA and $GABA_A$ receptors, respectively. By enhancing the effects of neurotransmitters without altering the normal pattern of neuronal activity, neuromodulators offer the possibility of developing "kinder and gentler" neuropharmacological drugs effective in certain neurological and neuropsychiatric disorders, with greater pharmacological specificity and reduced side effects.

Proposed Regulatory Approach for AMPAkines and GABAkines

In conjunction with its management and consultants, the Company intends to initially perform appropriate and required preclinical studies with its GABAkines and file investigational new drug applications ("INDs") to commence clinical trials with one or more of those drug candidates and either amend INDs or file new INDs for its AMPAkines in order to conduct additional clinical trials with those drug candidates. If such studies shows statistically significant improvement in appropriate clinical endpoints would likely result in the filing of one or more NDAs for the AMPAkine and GABAkine drug product candidates, under Section 505(b)(1) of the Federal Food, Drug and Cosmetic Act as amended, The 505(b)(1) NDA is the traditional regulatory path for new chemical entities (NCEs).

As part of our effort to capitalize upon a possible market opportunity with respect to neuromodulators, the Company has implemented an internal restructuring plan, by which EndeavourRx became a stand-alone business unit focused on the neuromodulator market. EndeavourRx comprises our AMPAkine program and our GABAkine program.

AMPAkines

The Company is developing a class of proprietary compounds known as AMPAkines, which are PAMs of the AMPA glutamate receptor. AMPAkines are small molecule compounds that enhance the excitatory actions of glutamate at the AMPA receptor complex, which mediates most excitatory transmission in the central nervous system ("CNS"). Through an extensive translational research effort from the cellular level through Phase 2 clinical trials, we have developed a family of AMPAkines, including CX717, CX1739 and CX1942 that may have clinical application in the treatment of CNS-driven neurobehavioral and cognitive disorders, SCI, neurological diseases, and certain orphan indications. CX717 and CX1739, our lead clinical compounds, have successfully completed multiple Phase 1 safety trials with no drug-associated serious adverse events. Both compounds have also completed Phase 2 efficacy trials demonstrating target engagement, by antagonizing the process of opioid-induced respiratory depression ("OIRD"). CX717 has successfully completed a Phase 2 trial demonstrating the ability to significantly reduce the symptoms of adult ADHD. In an early Phase 2 study, CX1739 improved breathing in patients with central sleep apnea. Preclinical studies have highlighted the potential ability of these AMPAkines to improve motor function in animals with SCI. Subject to raising sufficient financing (of which no assurance can be provided), we believe that we will be able to initiate a human Phase 2 study with CX1739 or CX717 in patients with SCI and a human Phase 2 study in patients with ADHD using either CX1739 or CX717.

AMPAkines as Treatment for ADHD

ADHD is a relatively common neurobehavioral disorder. Currently available treatments for ADHD include amphetamine-type stimulants and non-stimulant agents targeting monoaminergic neurotransmitter systems in the brain. However, these neurotransmitter systems are not restricted to the brain and are widely found throughout the body. Thus, while these agents can be effective in ameliorating ADHD symptoms, they also can produce adverse cardiovascular effects, such as increased heart rate and blood pressure. Existing treatments also affect eating habits and can reduce weight gain and growth in children and have been associated with suicidal ideation in adolescents and adults. In addition, approved stimulant treatments are DEA classified as controlled substances and present logistical issues for distribution and protection from diversion. Approved non-stimulant treatments, such as atomoxetine (Strattera® and its generic equivalents), can take four to eight weeks to become effective and undesirable side effects also have been observed.

Various investigators have generated data supporting the concept that alterations in AMPA receptor function might underlie the production of some of the symptoms of ADHD. In rodent and primate models of cognition, AMPAkines have been demonstrated to reduce inattention and impulsivity, two of the cardinal symptoms of ADHD. Furthermore, AMPAkines do not stimulate spontaneous locomotor activity in either mice or rats, unlike the stimulants presently used for the treatment of ADHD, nor do they increase the stimulation produced by amphetamine or cocaine. These preclinical considerations prompted us to conduct a randomized, double-blind, placebo controlled, two period crossover study to assess the efficacy and safety of CX717 in adults with ADHD.

In a repeated measures analysis, a statistically significant treatment effect on ADHD Rating Scale (ADHD-RS), the primary outcome measure, was observed after a three-week administration of CX717, 800 mg BID. Differences between this dose of CX717 and placebo were observed as early as week one of treatment and continued throughout the remainder of the study. The low dose of CX717, 200 mg BID, did not differ from placebo. In general, results from both the ADHD-RS hyperactivity and inattentiveness subscales, which were secondary efficacy variables, paralleled the results of the total score. CX717 was considered safe and well tolerated.

Based on these clinical results, we believe that AMPAkines such as CX717 or CX1739 might represent a breakthrough opportunity to develop a non-stimulating therapeutic for ADHD with the rapidity of onset normally seen with stimulants. Subject to raising sufficient financing (of which no assurance can be provided), we are planning to continue this program with a Phase 2 clinical trial in patients with adult ADHD using one of our two lead ampakine compounds.

AMPAkines as Treatment for SCI

AMPAkines also may have potential utility in the treatment and management of SCI to enhance motor functions and improve the quality of life for SCI patients. An estimated 17,000 new cases of SCI occur each year in the United States, most a result of automobile accidents. Currently, there are roughly 282,000 people living with spinal cord injuries, which often produce impaired motor function.

SCI can profoundly impair neural plasticity leading to significant morbidity and mortality in human accident victims. Plasticity is a fundamental property of the nervous system that enables continuous alteration of neural pathways and synapses in response to experience or injury. A large body of literature exists regarding the ability of AMPAkines to stimulate neural plasticity, possibly due to an enhanced synthesis and secretion of various growth factors.

The Company has been working with Dr. David Fuller at the University of Florida which has funding from NIH, to evaluate the use of AMPAkines for the treatment of compromised motor function in SCI. Using mice that have received spinal hemi-sections, CX717 was observed to increase motor nerve activity bilaterally. The effect on the hemisected side was greater than that measured on the intact side, with the recovery approximating that seen on the intact side prior to administration of ampakine. The doses of AMPAkines active in SCI were comparable to those demonstrating antagonism of OIRD, indicating target engagement of the AMPA receptors.

Recently, studies in patients with SCI have demonstrated that neural plasticity can be induced to improve motor function. This is based on the ability of spinal circuitry to learn how to adjust spinal and brainstem synaptic strength following repeated hypoxic bouts. Animal studies have demonstrated the ability of AMPAkines to dramatically enhance the effects of AIH on motor neuron activity after SCI. Because AMPAkines are known to enhance synaptic plasticity, the potential exists to harness repetitive AIH in combination with AMPAkines as a means of inducing functional recovery of motor function following SCI.

These animal models of motor nerve function following SCI support proof of concept for a new treatment paradigm using AMPAkines to improve motor functions in patients with SCI. With additional funding granted by NIH to Dr. Fuller, the Company is continuing its collaborative preclinical research with him, while it is planning a clinical trial program focused on developing AMPAkines for the restoration of certain motor functions in patients with SCI. The Company is working with researchers at highly regarded clinical sites to finalize a Phase 2 clinical trial protocol. We believe that a clinical study could be initiated within several months of raising sufficient financing (of which no assurance can be provided).

GABAkines

The GABAkine program was established pursuant to the UWMRF Patent License Agreement. At present, the program is focused on developing novel GABAkines with certain $GABA_A$ receptor subtype selectivity. We believe that there is a considerable degree of receptor subtype heterogeneity, making subtype selectivity of our compounds a desirable attribute.

Benzodiazepines ("BDZs"), such as Valium® (diazepam), Librium® (chlordiazepoxide) and Xanax® (alprazolam) were the first major class of drugs reported to act as $GABA_A$ PAMs, by binding at a site distinct from the binding site for GABA. These drugs produced a wide range of pharmacological properties, including anxiety reduction, sedation, hypnosis, anti-convulsant, muscle relaxation, respiratory depression, cognitive impairment, as well as tolerance, abuse and withdrawal. For this reason, it was not surprising that BDZs were observed to act as $GABA_A$ PAMs indiscriminately across all $GABA_A$ receptor subtypes. Following the identification of BDZ binding sites on $GABA_A$ receptors, Dr. Lippa described CL218,872, the first non-BDZ to demonstrate that these receptors were heterogeneous by binding selectively to a subtype of $GABA_A$ receptor. This demonstration of receptor heterogeneity led to the hypothesis that the various pharmacological actions of the BDZs might be separable depending on the receptor subtype involved. In animal testing, CL218,872 provided the proof of principle that such a separation could be achieved by displaying anti-anxiety and anti-convulsant properties in the absence of sedation, amnesia and muscular incoordination. These findings gave impetus to the search for novel therapeutic drugs for neurological and psychiatric illnesses that display improvements in efficacy and reductions in side effects.

Over the last several years, a group of scientists led by Dr. James Cook of the University of Wisconsin and Dr. Jeffrey Witkin affiliated with the Indiana University School of Medicine, have synthesized and tested a broad series of novel drugs that display $GABA_A$ receptor subtype selectivity and pharmacological specificity. Certain of these chemical compounds are the subject of the UWMRF Patent License Agreement and Drs Cook and Witkin have been engaged as consulting Research Fellows, while still maintaining their academic affiliations.

Of these compounds, we have identified KRM-II-81 as a clinical lead. KRM-II-81 is the most advanced and druggable of a series of compounds that display certain receptor subtype selectivity and pharmacological specificity. In studies using cell cultures, brain tissues and whole animals, KRM-II-81 acts as a $GABA_A$ PAM at selective $GABA_A$ receptor subtypes that we feel are intimately involved in neuronal processes underlying epilepsy, pain, anxiety and certain other indications. KRM-II-81 has demonstrated highly desirable properties in animal models of these and other potential therapeutic indications, in the absence of or with greatly reduced liability to produce sedation, motor incoordination, cognitive impairments, respiratory depression, tolerance, abuse and withdrawal seizures, all side effects associated with BDZs. We currently are focused on the potential treatment of epilepsy and pain.

Epilepsy and Existing Treatments

Epilepsy is a chronic and highly prevalent neurological disorder that affects millions of people world-wide and has serious consequences for the life of the affected individual. A first-line approach to the control of epilepsy is through the administration of anticonvulsant drugs. Repeated, uncontrolled seizures due to drug resistance and the side effects arising from seizure medications have a negative effect on the developing brain and can lead to brain cell loss and severe impairment of neurocognitive function. The continued occurrence of seizure activity also increases the probability of subsequent epileptic events through sensitization mechanisms called seizure kindling. Seizures that are unresponsive to anti-epileptic treatments are life-disrupting and life-threatening with broad health, life, and economic consequences.

Like many diseases, epilepsy is still remarkably underserved by currently available medicines. Pharmaco-resistance to anticonvulsant therapy continues to be one of the key obstacles to the treatment of epilepsy. Although many anticonvulsant drugs are approved to decrease seizure probability, seizures frequently are not fully controlled and patients are generally maintained daily on multiple antiepileptic drugs with the hope of enhancing the probability of seizure control. Despite this polypharmacy approach, as many as 60% to 70% of patients continue to have seizures. As a result of the lack of seizure control, pharmaco-resistant epilepsy patients, including young children, sometimes require and elect to have invasive therapeutic procedures such as surgical resection of targeted brain tissue.

Despite the availability of a host of marketed drugs of different mechanistic classes, the lack of seizure control in patients is the primary factor driving the need for improved antiepileptic drugs, as emphasized by researchers and patient advocacy communities. Increasing inhibitory tone in the CNS through enhancement of GABAergic inhibition is a proven mechanism for seizure control. However, GABAergic medications also exhibit liabilities that limit their antiepileptic potential. Tolerance develops to GABAergic drugs such as BDZs, limiting their use in a chronic setting. These drugs can produce cognitive impairment, somnolence, sedation, tolerance and withdrawal seizures that create dosing limitations such that they are generally used only for acute convulsive episodes.

GABAkines as Treatments for Epilepsy

KRM-II-81 has demonstrated efficacy in multiple rodent models and measures of antiepileptic drug efficacy *in vivo*. This includes nine acute seizure provocation models in mice and rats, four seizure sensitization models in rats and mice, two models of chronic epilepsy, and three models specifically testing pharmaco-resistant antiepileptic drug efficacy. Because it appears to have a substantially reduced side effect liability, it might be possible to use higher, more effective doses than standard of care medications. Predictions of superior efficacy of KRM-II-81 over standard of care anti-epileptics comes from the efficacy of this compound across a broad range of animal models of epilepsy. Importantly, KRM-II-81 has been shown to be effective in models assessing pharmaco-resistant epilepsy. Under these conditions, KRM-II-81 is efficacious in cases where standard of care medicines do not work.

In the absence of seizure control by anti-epileptics, surgical resection of affected brain tissue is one potential alternative to help with the control of seizures. In the process of this surgery, epileptic brain tissue can become available for research into epileptic mechanisms and the identification of novel antiepileptic drugs. The anticonvulsant action of KRM-II-81 has been confirmed by microelectrode recordings from slices obtained from freshly excised cortex from epileptic patients where KRM-II-81 suppressed epileptiform electrical activity. While preliminary, these translational data lend support to the further development of KRM-II-81 for the treatment of epilepsy.

GABAkines as Treatments for Pain

It is impossible not to be aware of the crisis that the opioid epidemic has created in the treatment of chronic pain. While there is no question as to their efficacy, the clinical use of opioids is severely limited due to the rapid development of tolerance and the production of OIRD, the major cause of opioid-induced lethality. Research programs are underway nationwide to discover and develop new non-opioid drugs that are effective analgesics without the tolerance and abuse liability ascribed to opioids. Chronic pain is especially difficult to treat due to its complex nature with a variety of different etiologies. For example, chronic pain may be produced by injury, surgery, neuropathy, the inflammation produced by arthritis or by certain drugs such as cancer chemotherapeutics. For these reasons, better management and control of chronic pain continues to be a serious need in medical practice.

Data from both preclinical and clinical studies are consistent with the idea that GABAergic neurotransmission is an important regulatory mechanism for the control of pain. Gabapentin (Neurontin®) and pregabalin (Lyrica®), two commonly used drugs for the treatment of chronic pain, are believed to produce their analgesic effects by enhancing GABAergic neurotransmission. However, although they have received FDA approval, the clinical results have not been overwhelming. In a published review of 37 clinical trials with a total of 5,914 patients experiencing neuropathic pain there was no difference in the percentage of patients experiencing pain reduction of greater than 50% when comparing gabapentin to placebo. The most common side effects produced by gabapentin were sedation, dizziness and problems walking. It is uncertain whether greater efficacy was not observed because of poor intrinsic pharmacological efficacy or insufficient dosages due to dose limiting side effects.

An alternate approach to enhancing GABAergic neurotransmission is the use of $GABA_A$ PAMs. This approach has been under-utilized because of the general lack of efficacy of the BDZ PAMs. However, a strong case for the potential value of subtype selective $GABA_A$ PAMs for the treatment of pain can be made. First, $GABA_A$ receptor regulated pathways are integral to pain processing with α2/3 containing $GABA_A$ receptor subtypes present on nerve pathways modulating pain sensation and perception. Second, we believe that the analgesic properties of BDZs may be masked by concurrent activation of other $GABA_A$ receptor subtypes that mediate the side effects. Diazepam has been reported to produce maximal analgesia if the side effects are attenuated by $GABA_A$ subtype genetic manipulation. Third, predecessor GABAkines, made by Dr. Cook, that selectively amplify $GABA_A$ receptor subtype signaling are effective in pain models in rodents at doses lower than those producing motor side effects.

In a number of laboratory procedures and animal studies, KRM-II-81 has been shown to selectively bind to $GABA_A$ receptor subtypes and enhance GABAergic neurotransmission. Sub-chronic dosing for 22 days with KRM-II-81 and the structural analogue, MP-III-80, demonstrated enduring analgesic efficacy without tolerance development. In contrast, tolerance developed to the analgesic effects of gabapentin. At a dose that produces maximal analgesic effect in an inflammatory chronic pain model, KRM-II-81 does not substitute for the BDZ midazolam in a drug discrimination assay, suggesting a reduced abuse liability. Furthermore, KRM-II-81 did not produce the respiratory depression observed with alprazolam, a major problem with BDZs leading to emergency room visits and overdose.

We believe that the ability to attenuate both acute and chronic pain combined with a greatly reduced side effect profile, a lack of tolerance and a reduced abuse potential makes KRM-II-81 a promising clinical lead and a potential advance in pain therapeutics. Results from preliminary chemistry, metabolism and pharmacokinetic studies support its further development.

Corporate and Product Development Plans

As discussed above, in order to facilitate our business activities and product development, we have organized our drug platforms into two separate business units which currently operate as divisions, but which are anticipated to be re-organized as separate legal entity subsidiaries in the future. ResolutionRx is focused on pharmaceutical cannabinoids and EndeavourRx is focused on neuromodulators. Below is a description of the Company's product development plans within these business units.

ResolutionRx – Dronabinol program

For the dronabinol program within our ResolutionRx cannabinoid platform, the Company plans to manufacture, on a pilot scale, one or more new proprietary formulations of dronabinol with the enhanced properties described in our patent applications, for which we anticipate needing to raise and spend approximately $150,000 to bench test *in vitro* several versions of dronabinol formulations, in order to determine those with the most optimum physico-chemical properties.

Assuming sufficient additional financing in available, of which no assurance can be provided, the Company intends to spend approximately $450,000 to $600,000 of these funds on the continued development of a proprietary formulation of dronabinol. This development would include (i) improvements to the Company's intellectual property position, (ii) improvements to our dronabinol formulation's PK profile, (iii) improvements to regulatory compliance, and (iv) expenditures for the initial stocking of clinical supply, packaging and distribution in anticipation of a Phase 2 PK/PD (pharmacokinetic/pharmacodynamic) clinical trial and a pivotal Phase 3 clinical study. The performance of the Phase 2 PK/PD clinical trial and Phase 3 clinical study, however, would need yet additional funds either from separate financings or a collaboration with a strategic partner.

The Purisys Agreement and the 2014 License Agreement will need to be transferred or otherwise made available to ResolutionRx. See "*—Noramco Inc./Purisys, LLC - Dronabinol Development and Supply Agreement*" and "*—University of Illinois 2014 Exclusive License Agreement*" in Note 9. Commitments and Contingencies in the notes to consolidated financial statements as of December 31, 2020 for more information on these agreements. Initially, ResolutionRx's primary focus will be on re-purposing dronabinol for the treatment of OSA, we believe that our broad enabling patents and our 2019 and 2021 patent applications for proprietary formulation technology may provide a framework for expanding into the larger burgeoning pharmaceutical cannabinoid industry. We believe that by converting this division to a subsidiary, it may be possible, through separate finance channels and potential strategic transactions, to optimize the asset value not only of the cannabinoid platform, but separately, our neuromodulation platform as well.

EndeavourRx – AMPAkines program

For the AMPAkines program within our EndeavourRx neuromodulators platform, the Company plans to initiate clinical testing of our AMPAkines in the treatment of SCI. To this end, we anticipate needing to raise and spend approximately $145,000 to assess the purity of our existing drug supplies and finalize a clinical trial protocol for a Phase 2A clinical trial to determine the safety, pharmacokinetic (PK) and pharmacodynamic (PD) properties of one of our lead AMPAkines in patients who have had SCI. These tasks are critical for applying to the FDA for permission to amend our existing IND or initiate a new IND enabling the commencement of clinical trials.

Assuming sufficient additional financing in available, of which no assurance can be provided, the Company would continue to focus on SCI, as we believe it would be the most efficient expenditure of our resources and yield an actionable result in the shortest period of time. Expenditures would include: (i) an estimated spend of $200,000 for chemistry, manufacturing and controls ("CMC") efforts, depending on the assessment of our drug supplies, (ii) an estimated spend of $400,000 on an initial Phase 2A single ascending dose safety and PK and PD study in human SCI patients, (iii) an estimated spend of $600,000 on a Phase 2A multiple ascending dose safety and PK and PD study in SCI patients, and (iv) an estimated spend of $650,000 on a Phase 2B efficacy study in SCI patients. Our initial, anticipated spend for ADHD would be approximately $100,000 for regulatory costs, with the larger spends occurring later dependent upon availability of financing.

EndeavourRx – GABAkines program

Assuming sufficient additional financing in available, of which no assurance can be provided, the Company plans to finance efforts with respect to the GABAkines program within our EndeavourRx neuromodulators platform. These efforts would be in preparation of an IND to be submitted to the FDA to commence human studies of KRM-II-81, our lead GABAkine drug candidate, for treatment-resistant epilepsy and chronic pain, and expenditures would include (i) an estimated spend of $530,000 for CMC efforts, (ii) an estimated spend of $450,000 for pre-clinical pharmacology, safety and absorption, distribution, metabolism, excretion ("ADME") studies, (iii) an estimated spend of $225,000 for animal safety studies and (iv) an estimated spend of $65,000 for regulatory consultants.

In connection with the organization and development of the ResolutionRx and EndeavourRx business units, we are planning certain corporate and development actions as summarized below. All of the below are subject to raising additional financing and/or entering into strategic relationships, of which no assurance can be given.

Proposed Creation of Subsidiaries

Pending approval by the Board of Directors, management intends to organize our ResolutionRx and EndeavourRx business units into two subsidiaries: (i) a ResolutionRx subsidiary, into which we intend to contribute our pharmaceutical cannabinoid platform and its related tangible and intangible assets and certain of its liabilities and (ii) an EndeavourRx subsidiary, into which we plan to contribute our neuromodulator platform, including both the AMPAkine and GABAkine programs and their related tangible and intangible assets and certain of their liabilities.

Management believes that there are several advantages to separating these platforms formally into newly formed subsidiaries, including but not limited to optimizing their asset values through separate finance channels and making them more attractive for capital raising as well as for strategic deal making.

Employee/Consultant Infrastructure Build-out

It is anticipated that the Company will continue to use, at least initially, its management personnel to provide management, operational and oversight services to these two business units. In order to broaden our operational expertise, we are planning to hire a number of highly qualified individuals, either as employees or consultants and, in tandem, increase our administrative support function. To date, we have hired David Dickason as Senior Vice-president of Pre-Clinical Product Development, and engaged Drs. James Cook and Jeffrey Witkin as consulting Research Fellows and engaged Dr. Rok Cerne as Senior Research Scientist.

Competition

The pharmaceutical industry is characterized by intensive research efforts, rapidly advancing technologies, intense competition and a strong emphasis on proprietary therapeutics. Our competitors include many companies, research institutes and universities that are working in a number of pharmaceutical or biotechnology disciplines to develop therapeutic products similar to those we are currently investigating. Most of these competitors have substantially greater financial, technical, manufacturing, marketing, distribution and/or other resources than we do. In addition, many of our competitors have experience in performing human clinical trials of new or improved therapeutic products and obtaining approvals from the FDA and other regulatory agencies. We have no experience in conducting and managing later-stage clinical testing or in preparing applications necessary to obtain regulatory approvals. We expect that competition in this field will continue to intensify.

Regulatory Requirements for Drug Market Approval

The FDA and other similar agencies in foreign countries have substantial requirements for therapeutic products. Such requirements often involve lengthy and detailed laboratory, clinical and post-clinical testing procedures and are expensive to complete. It often takes companies many years to satisfy these requirements, depending on the complexity and novelty of the product. The review process is also extensive, which may delay the approval process further. Failure to comply with applicable FDA or other requirements may subject a company to a variety of administrative or judicial sanctions, such as the FDA's refusal to approve pending applications, a clinical hold, warning letters, recall or seizure of products, partial or total suspension of production, withdrawal of the product from the market, injunctions, fines, civil penalties or criminal prosecution.

FDA approval is required before any new drug or dosage form, including the new use of a previously approved drug, can be marketed in the United States. Other similar agencies in foreign countries also impose substantial requirements.

The process of developing drug candidates normally begins with a discovery process of potential candidates that are then initially tested in *in vitro* and *in vivo* non-human animal (preclinical) studies which include but are not limited to toxicity and other safety related studies, pharmacokinetics, pharmacodynamics and ADME (absorption, distribution, metabolism, excretion). Once sufficient preclinical data are obtained, a company must submit an IND and receive authorization from the FDA in order to begin clinical trials in the United States. Successful drug candidates then move into human studies that are characterized generally as Phase 1, Phase 2 and Phase 3. Phase 1 studies seeking safety and other data normally utilize healthy volunteers. Phase 2 studies utilize one or more prospective patient populations and are designed to establish safety and preliminary measures of efficacy. Sometimes studies may be referred to as Phase 2A and 2B depending on the size of the patient population. Phase 3 studies are large trials in the targeted patient population, performed in multiple centers, often for longer periods of time and are designed to establish statistically significant efficacy as well as safety in the larger population. Most often the FDA and similar regulatory agencies in other countries require two confirmatory Phase 3 or pivotal studies. Upon completion of both the preclinical and clinical phases, an NDA (New Drug Application) is filed with the FDA or a similar filing is made to the regulatory authority in other countries. NDA filings are extensive and include the data from all prior studies. These filings are reviewed by the FDA and, only if approved, may the company or its partners commence marketing of the new drug in the United States.

There also are variations of these procedures. For example, companies seeking approval for new indications for an already approved drug may choose to pursue an abbreviated approval process such as the filing for an NDA under Section 505(b)(2). Another example would be a Supplementary NDA (“SNDA”). A third example would be an Abbreviated NDA (“ANDA”) claiming bioequivalence to an already approved drug and claiming the same indications such as in the case of generic drugs. Other opportunities allow for accelerated review and approval based upon several factors, including potential fast-track status for serious medical conditions and unmet medical needs, potential breakthrough therapy designation of the drug for serious conditions where preliminary evidence shows that the drug may show substantial improvement over available therapy or orphan designation (generally, an orphan indication in the United States is one with a patient population of less than 200,000).

As of yet, we have not obtained any approvals to market our products. Further, we cannot assure you that the FDA or other regulatory agency will grant us approval for any of our products on a timely basis, if at all. Even if regulatory clearances are obtained, a marketed product is subject to continual review, and later discovery of previously unknown problems may result in restrictions on marketing or withdrawal of the product from the market.

The recent COVID-19 pandemic has made it very difficult to recruit subjects and patients and to conduct clinical trials in general and it is unclear how long these challenges will last. Given the public health emergency during the winter and spring of 2020 which continues into 2021, the FDA issued guidance to be implemented without the normal prior public comment period as the FDA had concluded that public participation would not be feasible or appropriate. Guidance is not legally enforceable, but the FDA recommends the following of its guidance. Challenges are expected to arise from quarantines, site closures, travel limitations, interruptions to the supply chain for investigational products, or other considerations if site personnel or trial subjects become infected with COVID-19. These challenges may lead to difficulties in meeting protocol-specified procedures. The FDA emphasized that safety of trial participants is critically important. Decisions to continue or discontinue individual patients or the trial are expected to be made by trial sponsors in consultation with clinical investors and Institutional Review Boards. COVID-19 screening procedures may need to be implemented. As challenging as the clinical trial process is during normal times, the risks, strategic and operational challenges and the costs of conducting such trials has increased substantially during the pandemic.

See "Risk Factors—*Risks related to our business*—We are at an early stage of development and we may not be able to successfully develop and commercialize our products and technologies."

Manufacturing

We have no experience or capability to either manufacture bulk quantities of the new compounds that we develop, or to produce finished dosage forms of the compounds, such as tablets or capsules. We rely, and presently intend to continue to rely, on the manufacturing and quality control expertise of contract manufacturing organizations (see below with respect to dronabinol) or current and prospective corporate partners. There is no assurance that we will be able to enter into manufacturing arrangements to produce bulk quantities of our compounds on favorable financial terms. There is generally, absent any disruptions that may be caused by the current pandemic, substantial availability of both bulk chemical manufacturing and dosage form manufacturing capability throughout the world that we believe we can readily access.

On September 4, 2018, RespireRx entered into a dronabinol Development and Supply Agreement with Noramco Inc., one of the world's major dronabinol manufacturers, which Noramco subsequently assigned to its subsidiary, Purisys LLC. Under the terms of the Purisys Agreement, Noramco agreed to (i) provide all of the active pharmaceutical ingredient ("API") estimated to be needed for the clinical development process for both the first- and second-generation products (each a "Product" and collectively, the "Products"), three validation batches for New Drug Application ("NDA") filing(s) and adequate supply for the initial inventory stocking for the wholesale and retail channels, subject to certain limitations, (ii) maintain or file valid drug master files ("DMFs") with the FDA or any other regulatory authority and provide the Company with access or a right of reference letter entitling the Company to make continuing reference to the DMFs during the term of the agreement in connection with any regulatory filings made with the FDA by the Company, (iii) participate on a development committee, and (iv) make available its regulatory consultants, collaborate with any regulatory consulting firms engaged by the Company and participate in all FDA or Drug Enforcement Agency ("DEA") meetings as appropriate and as related to the API. We now refer to the second-generation product as our proprietary formulation or proprietary product and have de-emphasized the first-generation product.

In consideration for these supplies and services, the Company has agreed to purchase exclusively from Noramco during the commercialization phase all API for its Products (as defined in the Development and Supply Agreement) at a pre-determined price subject to certain producer price adjustments and agreed to Noramco's participation in the economic success of the commercialized Product or Products up to the earlier of the achievement of a maximum dollar amount or the expiration of a period of time.

See “Risk Factors—*Risks related to our business*—We are at an early stage of development and we may not be able to successfully develop and commercialize our products and technologies” for a discussion of certain risks related to the development and commercialization of our products.

Marketing

We have no experience in the marketing of pharmaceutical products and do not anticipate having the resources to distribute and broadly market any products that we may develop. We will therefore continue to seek commercial development arrangements with other pharmaceutical companies for our proposed products for those indications that require significant sales forces to effectively market. In entering into such arrangements, we may seek to retain the right to promote or co-promote products for certain of the orphan drug indications in North America. We believe that there is a significant expertise base for such marketing and sales functions within the pharmaceutical industry and expect that we could recruit such expertise if we choose to directly market a drug.

See “Risk Factors—*Risks related to our business*—We are at an early stage of development and we may not be able to successfully develop and commercialize our products and technologies” for a discussion of certain risks related to the marketing of our products.

Employees

As of December 31, 2020 and as of the date of filing of this Annual Report on Form 10-K, the Company employed five people (all officers), three of whom were full time. The Company also engages certain contractors who provide substantial services to the Company.

Technology Rights

University of Illinois License Agreement

See Note 9. Commitments and Contingencies – Significant Agreements and Contracts – *University of Illinois 2014 Exclusive License Agreement* to our consolidated financial statements at December 31, 2020.

UWMRF Patent License Agreement

See Note 9. Commitments and Contingencies – Significant Agreements and Contracts - to our consolidated financial statements at December 31, 2020.

Item 1A. Risk Factors

In addition to the other matters set forth in this Annual Report on Form 10-K, our continuing operations and the price of our common stock are subject to the following risks:

Risks related to our business

Our independent registered public accounting firm has expressed substantial doubt about our ability to continue as a going concern.

In its audit opinion issued in connection with our consolidated financial statements as of December 31, 2020 and 2019, our independent registered public accounting firm has expressed substantial doubt about our ability to continue as a going concern given our limited working capital, recurring net losses and negative cash flows from operations. The accompanying consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and the satisfaction of liabilities and commitments in the normal course of business. The consolidated financial statements do not include any adjustments relating to the recoverability and classification of recorded asset amounts or amounts of liabilities that might be necessary should we be unable to continue in existence. While we have relied principally in the past on external financing to provide liquidity and capital resources for our operations, we can provide no assurance that cash generated from our operations together with cash received in the future from external financing, if any, will be sufficient to enable us to continue as a going concern.

Our independent registered public accounting firm has identified material weaknesses in our financial reporting process.

At December 31, 2020, management and our independent registered public accounting firm identified material weaknesses in our internal control over financial reporting. There can be no assurance that we will be able to successfully implement our plans to remediate the material weaknesses in our financial reporting process. Our failure to successfully implement our plans to remediate these material weaknesses could cause us to fail to meet our reporting obligations, to produce timely and reliable financial information, and to effectively prevent fraud. Additionally, such failure, or other weaknesses that we may experience in our financial reporting process or other internal controls, could cause investors to lose confidence in our reported financial information, which could have a negative impact on our financial condition and stock price.

We have a history of net losses; we expect to continue to incur net losses and we may never achieve or maintain profitability.

Since our formation on February 10, 1987 through the end of our most recent fiscal year ended December 31, 2020, we have generated only minimal operating revenues. For the fiscal year ended December 31, 2020, our net loss was $4,301,211 and as of December 31, 2020, we had an accumulated deficit of $170,810,296. We have not generated any revenue from product sales to date, and it is possible that we will never generate revenues from product sales in the future. Even if we do achieve significant revenues from product sales, we expect to continue to incur significant net losses over the next several years. As with other biotechnology companies, it is possible that we will never achieve profitable operations.

We will need additional capital in the near term and the future and, if such capital is not available on terms acceptable to us or available to us at all, we may need to scale back our research and development efforts and may be unable to continue our business operations.

We require additional cash resources for basic operations and will require substantial additional funds to advance our research and development programs and to continue our operations, particularly if we decide to independently conduct later-stage clinical testing and apply for regulatory approval of any of our proposed products, and if we decide to independently undertake the marketing and promotion of our products. Additionally, we may require additional funds in the event that we decide to pursue strategic acquisitions of or licenses for other products or businesses. Based on our operating plan as of December 31, 2020, we estimated that our existing cash resources will not be sufficient to meet our requirements for 2021. We also need additional capital in the near term to fund on-going operations including basic operations. Additional funds may come from the sale of common equity, preferred equity, convertible preferred equity or equity-linked securities, debt, including debt convertible into equity, or may result from agreements with larger pharmaceutical companies that include the license or rights to the technologies and products that we are currently developing, although there is no assurance that we will secure any such funding or other transaction in a timely manner, or at all.

Our cash requirements in the future may differ significantly from our current estimates, depending on a number of factors, including:

- Our ability to raise equity or debt capital, or our ability to obtain in-kind services which may be more difficult during the current pandemic health crisis;
- the results of our clinical trials;
- the time and costs involved in obtaining regulatory approvals;
- the costs associated with the implementation of a corporate restructure
- the costs of setting up and operating our own marketing and sales organization;
- the ability to obtain funding under contractual and licensing agreements;
  the ongoing obligations to make contractual licensed patent maintenance fees, milestone payments and royalty payments
- the costs involved in filing, prosecuting, maintaining and enforcing patents or any litigation by third parties regarding intellectual property;
- the costs involved in meeting our contractual obligations including employment agreements; and
- our success in entering into collaborative relationships with other parties.

Common Stock reserve requirements may restrict our ability to raise capital and continue to operate our business

Common Stock reserve requirements may restrict our ability to raise capital and continue to operate our business. As of December 31, 2020, the Company was required to reserve 126,855,971 shares of its authorized and unissued Common Stock with respect to convertible notes, convertible Series B Preferred Stock, warrants, options granted not yet exercised and shares available for issuance its equity plans, inclusive of incremental contractual reserves in excess of the calculated number of conversion shares and warrant shares. There are 1,801,872,935 authorized, unissued and unreserved shares of Common Stock available after reserving for the incremental contractual reserves of 68,777,142. If we breach the contractual reserve requirements we will be in default of such contractual obligations which may have material adverse consequences which may make it more difficult to raise additional necessary capital.

Our product opportunities rely on licenses from research institutions and if we lose access to these technologies or applications, our business could be substantially impaired.

Through our acquisition of Pier, we gained access to a pre-existing relationship between Pier and the UIC. Effective in September 2014, the Company entered into the UIC License Agreement with the UIC, which gave the Company certain exclusive rights with respect to certain patents and patent applications in the United States and other countries claiming the use of dronabinol and other cannabinoids for the treatment of sleep-related breathing disorders, including sleep apnea. The UIC License Agreement obligates the Company to comply with various commercialization and reporting requirements and to make various royalty payments, including potential one-time and annual royalty payments, as well as payments upon the achievement of certain development milestones.

The Company and UWMRF executed the UWMRF Patent License Agreement effective August 1, 2020 pursuant to which RespireRx licensed the intellectual property identified therein, including with respect to GABAkines. In consideration for the licenses granted, the Company will pay to UWMRF patent filing and prosecution costs, annual license maintenance fees, one-time milestone payments, and annual royalties.

If we are unable to comply with the terms of these licenses, such as required payments thereunder, these licenses might be terminated.

We may not be able to successfully develop and commercialize our product candidates and technologies.

The development of our product candidates is subject to risks commonly experienced in the development of products based upon innovative technologies and the expense and difficulty of obtaining approvals from regulatory agencies. Drug discovery and development is time consuming, expensive and unpredictable. On average, only one out of many thousands of chemical compounds discovered by researchers proves to be both medically effective and safe enough to become an approved medicine.

All of our product candidates are in development spectrum that runs from preclinical to Phase 2 clinical trials, but we not have any currently active trials. Assuming these trials are initiated, which will require additional financing, we are planning for additional preclinical studies and Phase 1, Phase 2A, Phase 2B and Phase 3 clinical trials, we do not have any currently active trials. Accordingly, we will require significant additional funding for research, development and clinical testing of our product candidates, which may not be available on favorable terms or at all.

Additionally, our success, at least in part, is dependent upon the strength of our intellectual property, including, but not limited to licensed and owned patents, patent applications, continuations-in-part, provisional patent applications, know-how, trade secrets and other forms of intellectual property. The issuance of patents with relevant claims is subject to varying degrees of uncertainty. Our ability to defend our intellectual property or challenge third party intellectual property infringement claims is expensive, time consuming and uncertain. If our patent applications do not issue with relevant claims or if we cannot defend our patents, or, as appropriate, challenge interfering patents or actions of third parties, or otherwise maintain our intellectual property, our business and operations will be adversely affected.

The process from discovery to development to regulatory approval can take several years and drug candidates can fail at any stage of the process. Late-stage clinical trials often fail to replicate results achieved in earlier studies. We cannot be certain that we will be able to successfully complete any of our research and development activities. One of our product candidates is based, at least in part, on the development of one or more new formulations and the repurposing of an approved drug, the development of which is inherently risky while others of our product candidates have never been approved for marketing by any regulatory bodies and are subject to substantial research and development risks. Concerns about the safety and efficacy of our product candidates could limit our future success.

Even if we do complete our research and development activities, we may not be able to successfully market any of the product candidates or be able to obtain the necessary regulatory approvals or assure that healthcare providers and payors will accept our product candidates. We also face the risk that any or all of our product candidates will not work as intended or that they will be unsafe, or that, even if they do work and are safe, that our product candidates will be uneconomical to manufacture and market on a large scale. Due to the extended testing and regulatory review process required before we can obtain marketing clearance, we do not expect to be able to commercialize any therapeutic drug for several years, either directly or through our corporate partners or licensees.

We have announced a restructuring plan to facilitate the financing of our business initiatives. We may not achieve some or all of the expected benefits of our restructuring plan and the restructuring may adversely affect our business.

We plan to incorporate as newly formed subsidiaries, what are currently identified divisions of the Company, namely, ResolutionRx and EndeavourRx with the goals, among others, of improving our ability to finance those platforms and attract potential strategic partners. There can be no assurance that these goals or any of our intended goals will be achieved.

We have not voluntarily implemented various corporate governance measures, in the absence of which stockholders may have more limited protections against interested director transactions, conflicts of interests and similar matters.

We have not adopted any corporate governance measures since our securities are not yet listed on a national securities exchange and we are not required to do so. We have not adopted corporate governance measures such as separate audit or other independent committees of our Board as we presently have only one independent director. If we expand our board membership in future periods to include additional independent directors, we may seek to establish an audit and other committees of our Board. It is possible that if our Board included additional independent directors and if we were to adopt some or all of these corporate governance measures, stockholders would benefit from somewhat greater assurances that internal corporate decisions were being made by disinterested directors and that policies had been implemented to define responsible conduct. For example, in the absence of audit, nominating and compensation committees comprised of at least a majority of independent directors, decisions concerning matters such as compensation packages to our senior officers and recommendations for director nominees may be made by a majority of directors who have an interest in the outcome of the matters being decided. You should bear in mind our current lack of corporate governance measures in formulating investment decisions.

The novel coronavirus (COVID-19) pandemic may negatively impact our ability to successfully develop and commercialize our product candidates and technologies and may ultimately affect our business, financial condition and results of operations.

In March 2020, the World Health Organization declared COVID-19 a global pandemic, and governmental authorities around the world have implemented measures to reduce the spread of COVID-19. These measures have adversely affected workforces, customers, supply chains, consumer sentiment, economies, and financial markets, and, along with decreased consumer spending, have led to an economic downturn across many global economies. The COVID-19 pandemic rapidly escalated in the United States and continues to evolve, creating significant uncertainty and economic disruption, and leading to record levels of unemployment nationally. Numerous state and local jurisdictions had imposed, and those and others in the future may impose, shelter-in-place orders, quarantines, shut-downs of non-essential businesses, and similar government orders and restrictions on their residents to control the spread of COVID-19.

The COVID-19 pandemic and government responses thereto have made it very difficult to recruit clinical trial subjects and patients and to conduct clinical trials in general. We expect the life sciences industry and clinical trial activity to continue to face challenges arising from quarantines, site closures, travel limitations, interruptions to the supply chain for investigational products and other considerations if site personnel or trial subjects become infected with or are significantly at risk of contracting COVID-19. These challenges may lead to difficulties in meeting protocol-specified procedures. Further, in response to the public health emergency, the FDA issued guidance in March and July 2020 emphasizing that safety of trial participants is critically important. Decisions to continue or discontinue individual patients or the trial are expected to be made by trial sponsors in consultation with clinical investors and Institutional Review Boards, which may lead to the implementation of additional protocols such as COVID-19 screening procedures, resulting in potential delays and additional costs. The risks, strategic and operational challenges and costs of conducting such trials as a result of the global pandemic have exacerbated an already challenging clinical trial process, which may negatively impact our ability to plan or conduct trials if we secure sufficient financing to enable us to pursue such activity.

In addition, we may be impacted by the downturn in the U.S. economy, which could have an adverse impact on our ability to raise capital and our business operations.

The extent to which COVID-19 ultimately impacts our business, financial condition and results of operations will depend on future developments, which are highly uncertain and unpredictable, including new information which may emerge concerning the severity and duration of the COVID-19 pandemic and the effectiveness of actions taken to contain the COVID-19 pandemic or treat its impact, among others. Additionally, the extent to which COVID-19 ultimately impacts our operations will depend on a number of factors, many of which will be outside of our control. The COVID-19 pandemic is evolving and new information emerges regularly, including for example, the FDA's and other governmental regulatory bodies' approval of various COVID-19 vaccinations products which are being widely distributed and administered in the United States and around the world; accordingly, the ultimate consequences of the COVID-19 pandemic cannot be predicted with certainty. In addition to the disruptions adversely impacting our business and financial results, they may also have the effect of heightening many of the other risks described in these risk factors, including risks relating to our ability to begin to generate revenue, to generate positive cash flow, our relationships with third parties, and many other factors. We will attempt to minimize these impacts, but there can be no assurance that we will be successful in doing so.

We may not be able to enter into the strategic alliances necessary to fully develop and commercialize our products and technologies, and we will be dependent on our strategic partners if we do.

We are seeking pharmaceutical companies and other strategic partners to participate with us in the development of major indications for the cannabinoids and neuromodulator compounds. These agreements would potentially provide us with additional funds or in-kind services in exchange for exclusive or non-exclusive license or other rights to the technologies and products that we are currently developing. Competition between biopharmaceutical companies for these types of arrangements is intense. We cannot give any assurance that our discussions with candidate companies will result in an agreement or agreements in a timely manner, or at all. Additionally, we cannot assure you that any resulting agreement will generate sufficient revenues to offset our operating expenses and longer-term funding requirements.

If our third-party manufacturers' facilities do not follow established current good manufacturing guidelines and practices, our product development and commercialization efforts may be harmed.

There are a limited number of manufacturers that operate under the FDA's and European Union's good manufacturing practices regulations and are capable of manufacturing products like those we are developing. Third-party manufacturers may encounter difficulties in achieving quality control and quality assurance and may experience shortages of qualified personnel. A failure of third-party manufacturers to follow current good manufacturing practices or other regulatory requirements and to document their adherence to such practices may lead to significant delays in the availability of products for commercial use or clinical study, the termination of, or hold on, a clinical study, or may delay or prevent filing or approval of marketing applications for our products. In addition, we could be subject to sanctions, including fines, injunctions and civil penalties. Changing manufacturers may require additional clinical trials and the revalidation of the manufacturing process and procedures in accordance with FDA mandated current good manufacturing practices and would require FDA approval. This revalidation may be costly and time consuming. If we are unable to arrange for third-party manufacturing of our products, or to do so on commercially reasonable terms, we may not be able to complete development or marketing of our products.

Our ability to use our net operating loss carry forwards will be subject to limitations upon a change in ownership, which could reduce our ability to use those loss carry forwards following any change in Company ownership.

Generally, a change of more than 50% in the ownership of a Company's stock, by value, over a three-year period constitutes an ownership change for U.S. federal income tax purposes. An ownership change may limit our ability to use our net operating loss carry forwards attributable to the period prior to such change. We have sold or otherwise issued shares of our common stock in various transactions sufficient to constitute an ownership change. As a result, if we earn net taxable income in the future, our ability to use our pre-change net operating loss carry forwards to offset U.S. federal taxable income will be subject to limitations, which would restrict our ability to reduce future tax liability. Future shifts in our ownership, including transactions in which we may engage, may cause additional ownership changes, which could have the effect of imposing additional limitations on our ability to use our pre-change net operating loss carry forwards.

Risks related to our industry

If we fail to secure adequate intellectual property protection, it could significantly harm our financial results and ability to compete.

Our success will depend, in part, on our ability to obtain and maintain patent protection for our products and processes in the United States and elsewhere. We have filed and intend to continue to file patent applications as we need them. However, additional patents that may issue from any of these applications may not be sufficiently broad to protect our technology. Also, any patents issued to us or licensed by us may be designed around or challenged by others, and if such design or challenge is effective, it may diminish our rights and negatively affect our financial results.

If we are unable to obtain and maintain sufficient protection of our proprietary rights in our products or processes prior to or after obtaining regulatory clearances, our competitors may be able to obtain regulatory clearance and market similar or competing products by demonstrating at a minimum the equivalency of their products to our products. If they are successful at demonstrating at least the equivalency between the products, our competitors would not have to conduct the same lengthy clinical tests that we have or will have conducted.

We also rely on trade secrets and confidential information that we protect by entering into confidentiality agreements with other parties. Those confidentiality agreements could be breached, and our remedies may be insufficient to protect the confidential information. Further, our competitors may independently learn our trade secrets or develop similar or superior technologies. To the extent that our consultants, key employees or others apply technological information independently developed by them or by others to our projects, disputes may arise regarding the proprietary rights to such information or developments. We cannot assure you that such disputes will be resolved in our favor.

We may be subject to potential product liability claims. One or more successful claims brought against us could materially adversely affect our business and financial condition.

The clinical testing, manufacturing and marketing of our products may expose us to product liability claims. We have never been subject to a product liability claim, and we require each patient in our clinical trials to sign an informed consent agreement that describes the risks related to the trials, but we cannot assure you that the coverage limits of our insurance policies will be adequate or that one or more successful claims brought against us would not have a material adverse effect on our business, financial condition and result of operations. Further, if one of our cannabinoid or AMPAkine compounds is approved by the FDA for marketing, we cannot assure you that adequate product liability insurance will be available, or if available, that it will be available at a reasonable cost. Any adverse outcome resulting from a product liability claim could have a material adverse effect on our business, financial condition and results of operations.

We face intense competition, and our competitors may develop products that are superior to those we are developing.

The pharmaceutical industry is characterized by intensive research efforts, rapidly advancing technologies, intense competition and a strong emphasis on proprietary therapeutics. Our competitors include many companies, research institutes and universities that are working in a number of pharmaceutical or biotechnology disciplines to develop therapeutic products similar to those we are currently investigating. Most of these competitors have substantially greater financial, technical, manufacturing, marketing, distribution or other resources than we do. In addition, many of our competitors have experience in performing human clinical trials of new or improved therapeutic products and obtaining approvals from the FDA and other regulatory agencies. We have no experience in conducting and managing later-stage clinical testing or in preparing applications necessary to obtain regulatory approvals. We expect that competition in this field will continue to intensify.

Our patents and patent applications do not cover the entire world, thus limiting the potential exclusive commercialization of our products to those countries in which we have intellectual property protection. We are aware of at least one company that may be developing a product or product similar to one of our prospective products for our proposed indication in countries where we do not have intellectual property protection. Such company or companies may choose to compete with us in countries where we do have intellectual property protection and cause us to expend resources defending our intellectual property. A liberal regulatory environment or unenforced or poorly enforced regulations may encourage competition from non-drug products such as medical marijuana or dietary supplements and similar products containing cannabis-derived molecules making claims that would be competitive with our proposed regulatory-approved claims. Since our target markets are very large, there is a great deal of economic incentive for others to enter and compete in those markets. We must compete with other companies with respect to their research and development efforts and for capital and other forms of funding. An inability to compete would have a material adverse impact on our business operations.

We may be unable to recruit and retain our senior management and other key technical personnel on whom we are dependent.

We are highly dependent upon senior management and key technical personnel and currently do not carry any insurance policies on such persons. In particular, we are highly dependent on Timothy L. Jones, our CEO and President, Arnold S. Lippa, Ph.D., our Chief Scientific Officer and Executive Chairman, Jeff E. Margolis, our Senior Vice President, Chief Financial Officer, Treasurer and Secretary, and David Dickason, our Senior Vice President of Preclinical Product Development. Competition for qualified employees among pharmaceutical and biotechnology companies is intense. The loss of any of our senior management or other key employees, or our inability to attract, retain and motivate the additional or replacement highly skilled employees and consultants that our business requires, could substantially hurt our business prospects.

The regulatory approval process is expensive, time consuming, uncertain and may prevent us from obtaining required approvals for the commercialization of some of our products.

The FDA and other similar agencies in foreign countries have substantial requirements for therapeutic products. Such requirements often involve lengthy and detailed laboratory, clinical and post-clinical testing procedures and are expensive to complete. It often takes companies many years to satisfy these requirements, depending on the complexity and novelty of the product. The review process is also extensive, which may delay the approval process even more.

As of yet, we have not obtained any approvals to market our products. Further, we cannot assure you that the FDA or other regulatory agency will grant us approval for any of our products on a timely basis, if at all. Even if regulatory clearances are obtained, a marketed product is subject to continual review, and later discovery of previously unknown problems may result in restrictions on marketing or withdrawal of the product from the market.

Risks related to capital structure

Our stock price is volatile and our common stock could decline in value.

Our Common Stock is currently quoted for public trading on the OTCQB Venture Market. The trading price of our Common Stock has been subject to wide fluctuations and may fluctuate in response to a number of factors, many of which will be beyond our control.

The market price of securities of life sciences companies in general has been very unpredictable. Broad market and industry factors may adversely affect the market price of our Common Stock, regardless of our operating performance. In the past, following periods of volatility in the market price of a company's securities, securities class-action litigation has often been instituted. Such litigation, if instituted, could result in substantial costs for us and a diversion of management's attention and resources.

The range of sales prices of our common stock, as adjusted for the reverse stock-split effected on January 5, 2021, for the fiscal years ended December 31, 2020 and 2019, as quoted on the OTC Markets, was $1.499 and $0.0200 and $8.5000 to $0.9800, respectively. The following factors, in addition to factors that affect that market generally, could significantly affect our business, and the market price of our common stock could decline:

- competitors announcing technological innovations or new commercial products;
- competitors' publicity regarding actual or potential products under development;
- regulatory developments in the United States and foreign countries;
- legal developments regarding cannabinoids and cannabis products in the United States and foreign countries
- developments concerning proprietary rights, including patent litigation;
- public concern over the safety of therapeutic products; and
- changes in healthcare reimbursement policies, healthcare regulations and standard of care requirements.

Our common stock is thinly traded and you may be unable to sell some or all of your shares at the price you would like, or at all, and sales of large blocks of shares may depress the price of our common stock.

Our common stock has historically been sporadically or "thinly-traded," meaning that the number of persons interested in purchasing shares of our common stock at prevailing prices at any given time may be relatively small or nonexistent. As a consequence, there may be periods of several days or more when trading activity in shares of our common stock is minimal or non-existent, as compared to a seasoned issuer that has a large and steady volume of trading activity that will generally support continuous sales without an adverse effect on share price. This could lead to wide fluctuations in our share price. You may be unable to sell your common stock at or above your purchase price, which may result in substantial losses to you. Also, as a consequence of this lack of liquidity, the trading of relatively small quantities of shares by our stockholders may disproportionately influence the price of shares of our common stock in either direction. The price of shares of our common stock could, for example, decline precipitously in the event a large number of shares of our common shares are sold on the market without commensurate demand, as compared to a seasoned issuer which could better absorb those sales without adverse impact on its share price.

There is a large number of shares of the Company's common stock that may be issued or sold, and if such shares are issued or sold, the market price of our common stock may decline.

As of December 31, 2020, we had 71,271,095 shares of our common stock outstanding on a post-reverse stock split basis which occurred on January 5, 2021.

If all warrants and options outstanding as of December 31, 2020 were exercised prior to their respective expiration dates, up to 35,974,567 additional shares of our common stock could become freely tradable. The issuance of such shares would dilute the interests of the current stockholders and sales of substantial amounts of common stock in the public market could adversely affect the prevailing market price of our common stock and could also make it more difficult for us to raise funds through future offerings of common stock.

As of December 31, 2020, there were remaining outstanding convertible notes totaling $414,860 inclusive of accrued interest. Of that amount, $372,659 was convertible into 13,333,036 shares of common stock and $42,201 was convertible into an indeterminate number of shares of common stock as such notes may convert, at the option of each note holder, acting separately and independently of the other note holders, into the next exempt private securities offering of equity securities.

If we issue additional equity or equity-based securities, the number of shares of our common stock outstanding could increase substantially, which could adversely affect the prevailing market price of our common stock and could also make it more difficult for us to raise funds through future offerings of common stock.

Our charter document and other governing documents may prevent or delay an attempt by our stockholders to replace or remove management.

Certain provisions of our restated certificate of incorporation, as amended, could make it more difficult for a third party to acquire control of our business, even if such change in control would be beneficial to our stockholders. Our restated certificate of incorporation, as amended, allows the Board of Directors of the Company to issue, as of December 31, 2020, up to 5,000,000 shares of preferred stock, with characteristics to be determined by the board, without stockholder approval. The ability of our Board of Directors to issue additional preferred stock may have the effect of delaying or preventing an attempt by our stockholders to replace or remove existing directors and management.

Historically, warrants to purchase common stock have been issued as compensation for professional services, typically related to fund raising or have been issued in connection with the issuance of certain notes.

In addition, on several occasions, certain executive officers, members of the Board of Directors and certain vendors have offered to forgive accrued compensation and other amounts due to them, and the Board of Directors accepted such offers in exchange for either shares of common stock or options to purchase common stock. In particular, if executive officers offered and if the Board of Directors accepts such offer(s) in the future, a significant number of shares of common stock or one or more options to purchase a significant number of shares of common stock could be issued or granted. The ability of our Board of Directors to issue additional shares of common stock or options to purchase shares of common stock, or warrants to purchase shares of common stock, may have the effect of delaying or preventing an attempt by our stockholders to replace or remove existing directors and management.

If our common stock is determined to be a "penny stock," a broker-dealer may find it more difficult to trade our common stock and an investor may find it more difficult to acquire or dispose of our common stock in the secondary market.

In addition, our common stock may be subject to the so-called "penny stock" rules. The United States Securities and Exchange Commission ("SEC") has adopted regulations that define a "penny stock" to be any equity security that has a market price per share of less than $5.00, subject to certain exceptions, such as any securities listed on a national securities exchange. For any transaction involving a "penny stock," unless exempt, the rules impose additional sales practice requirements on broker-dealers, subject to certain exceptions. If our common stock is determined to be a "penny stock," a broker-dealer may find it more difficult to trade our common stock and an investor may find it more difficult to acquire or dispose of our common stock on the secondary market.

We may issue additional shares of our Common Stock, and investment in our company is likely to be subject to substantial dilution.

Stockholders' interests in the Company will be diluted and stockholders may suffer dilution in their net book value per share when we issue additional shares. Dilution is the difference between what investors pay for their stock and the net tangible book value per share immediately after the additional shares are purchased. We are authorized to issue up to 2,000,000,000 (2 billion) shares of Common Stock. Our financing activities in the past focused on convertible note financing that requires us to issue shares of Common Stock to satisfy principal, interest and any applicable penalties related to these convertible notes. When required under the terms and conditions of the convertible notes, we issue additional shares of Common Stock that have a dilutive effect on our stockholders. We anticipate that all or at least a substantial portion of our future funding, if any, will be in the form of equity financing from the sale of our Common Stock and so any investment in the Company will likely be diluted, with a resulting decline in the value of our Common Stock.

Additional financing may not be available on terms acceptable to us, and our ability to raise capital through equity financing may be limited by the number of authorized shares of our Common Stock. In order to raise significant additional amounts from equity financing, we will need to seek, and have sought, stockholder approval to amend our Certificate of Incorporation to increase the number of authorized shares of our Common Stock, and any such amendment would require the approval of the holders of a majority of the outstanding shares of our Common Stock. If we are unable to obtain needed financing on acceptable terms, we may not be able to implement our business plan, which could have a material adverse effect on our business, financial condition, results of operations and prospects.

Our Common Stock was subject to removal from the OTC Markets OTCQB quotation service due to our stock not have a closing bid price of at least $0.01 per share for a period of 10 consecutive trading days on or before December 10, 2020

A downgrade of our Common Stock to the lower OTC Pink market occurred on December 10, 2020.

To bring the Company's stock price back into compliance, the Company gained stockholder approval for a ten-to-one (10:1) reverse stock split as described in Note 10. Subsequent Events—Special Meeting of the Stockholders. The reverse stock split occurred on January 5, 2021 and Common Stock began trading on a post-reverse stock split basis on the OTC Markets OTC Pink Market from January 6, 2021 through February 5, 2021 while measuring for thirty calendar days, compliance with the uplisting requirements for listing on the OTC Markets OTCQB Venture Market.

Our common stock was subject to an uplisting back to the OTC Markets OTCQB quotation service on February 8, 2021

Delaware law, our Certificate of Incorporation and our Bylaws provides for the indemnification of our officers and directors at our expense, and correspondingly limits their liability, which may result in a major cost to us and hurt the interests of our shareholders because corporate resources may be expended for the benefit of officers and/or directors.

Our Certificate of Incorporation and By-Laws of the Company, as amended (the "Bylaws") include provisions that eliminate the personal liability of our directors for monetary damages for breach of fiduciary duty as a director, except for liability (i) for any breach of the director's duty of loyalty to the Company or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the Delaware General Corporation Law, or (iv) for any transaction from which the director derived an improper personal benefit. These provisions eliminate the personal liability of our directors and our shareholders for monetary damages arising out of any violation of a director of his fiduciary duty of due care, but do not affect a director's liabilities under the federal securities laws or the recovery of damages by third parties.

We do not intend to pay cash dividends on any investment in the shares of stock of our Company and any gain on an investment in our Company will need to come through an increase in our stock's price, which may never happen.

We have never paid any cash dividends and currently do not intend to pay any cash dividends for the foreseeable future. To the extent that we require additional funding currently not provided for, our funding sources may prohibit the payment of a dividend. Because we do not currently intend to declare dividends, any gain on an investment in our Company will need to come through an increase in our Common Stock's price. This may never happen, and investors may lose all of their investment in our Company.

FINRA sales practice requirements may also limit a stockholder's ability to buy and sell our stock.

In addition to the "penny stock" rules described above, FINRA has adopted rules that require that in recommending an investment to a customer, a broker-dealer must have reasonable grounds for believing that the investment is suitable for that customer. Prior to recommending speculative low-priced securities to their non-institutional customers, broker-dealers must make reasonable efforts to obtain information about the customer's financial status, tax status, investment objectives and other information. Under interpretations of these rules, FINRA believes that there is a high probability that speculative low-priced securities will not be suitable for at least some customers. FINRA requirements make it more difficult for broker-dealers to recommend that their customers buy our Common Stock, which may limit your ability to buy and sell our stock and have an adverse effect on the market for our shares.

Costs and expenses of being a reporting company under the Exchange Act are substantial and prevent us from achieving profitability.

We are subject to the reporting requirements of the Exchange Act and aspects of the Sarbanes-Oxley Act. We expect that the requirements of these rules and regulations will continue to comprise a substantial portion of our legal, accounting and financial compliance costs, and to make some activities more difficult, time-consuming and costly, placing significant strain on our personnel, systems and resources.

If we fail to remain current on our reporting requirements, we could be periodically removed from the OTCQB, which would limit the ability of broker-dealers to sell our Common Stock and the ability of stockholders to sell their Common Stock in the secondary market.

Companies trading on the OTCQB must be reporting issuers under Section 12 of the Exchange Act, and must be current in their filings under the Exchange Act to maintain price quotation privileges on the OTCQB. If we fail to remain current on our reporting requirements, we could be removed from the OTCQB and be forced to be traded on the OTC Pink Sheets, which requires a more challenging stock purchase process. As a result, the liquidity for our Common Stock could be adversely affected by limiting the ability of broker-dealers to sell our common stock and the ability of stockholders to sell their Common Stock in the secondary market. The OTCQB is recognized by the SEC as an established public market. The OTC Pink Sheets is the lowest and most speculative tier of the three marketplaces for the trading of over-the-counter stocks.

OTC Pink Sheets shares generally trade thinly and infrequently making it hard to buy or sell when the investor wants to complete a transaction. Accordingly, the market for our Common Stock would be significantly diminished if we were forced to trade on the OTC Pink Sheets market.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

As of December 31, 2020, the Company did not own any real property or maintain any leases with respect to real property. The Company periodically contracts for services provided at the facilities owned by third parties and may, from time-to-time, have employees who work in these facilities.

Item 3. Legal Proceedings

We are periodically subject to various pending and threatened legal actions and claims. See Note 9. Commitments and Contingencies – *Pending or Threatened Legal Actions and Claims* in the notes to our consolidated financial statements for the year ended December 31, 2020 for additional information regarding these matters.

The legal proceedings discussed in this report could result in adverse judgments, settlements, fines, injunctions, restitutions or other relief that could require significant expenditures or have other effects on our business. Management believes, based on current knowledge and after consultation with counsel, that the outcome of such actions will not have a material adverse effect on our consolidated financial condition. The outcome of litigation and other legal proceedings is inherently uncertain, and it is possible that one or more of the matters currently pending or threatened could have an adverse effect on our liquidity, financial condition or results of operations for any particular period.

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

Our common stock was quoted on the OTC Pink Market on December 31, 2020 and is quoted as of February 8, 2021 on the OTCQB Venture Market, under the symbol "RSPI". The current quotations on the OTCQB Venture Market and prior quotations on the OTB Pink Market reflect inter-dealer prices, without retail mark-up, mark-down or commission and may not necessarily represent actual transactions.

As of April 9, 2021, there were 95 stockholders of record of our common stock, and approximately 4,000 beneficial owners. The high and low sales prices for our common stock on December 31, 2020, as quoted on the OTC Pink Market market, were $0.0350 and $0.0285, respectively, the last date of the fiscal year on which the common stock traded (81,220 shares of common stock). The high and low prices and the volume of shares traded were based on post-reverse split shares. On January 5, 2021, we effected a 10:1 reverse stock split, exchanging one new share for each ten old shares.

We have never paid cash dividends on our common stock and do not anticipate paying such dividends in the foreseeable future. The payment of dividends, if any, will be determined by the Board in light of conditions then existing, including our financial condition and requirements, future prospects, restrictions in financing agreements, business conditions and other factors deemed relevant by the Board.

During the fiscal year ended December 31, 2020, we did not repurchase any of our securities.

Item 6. Selected Financial Data

Not applicable to smaller reporting companies.

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

The following discussion and analysis should be read in conjunction with the audited financial statements and notes related thereto appearing elsewhere in this document.

Overview

The mission of the Company is to develop innovative and revolutionary treatments to combat disorders caused by disruption of neuronal signaling. We are developing treatment options that address conditions that affect millions of people, but for which there are limited or poor treatment options, including OSA, attention deficit hyperactivity disorder ("ADHD") epilepsy, chronic pain, including inflammatory and neuropathic pain, recovery from spinal cord injury ("SCI"), as well as other areas of interest based on results of animal studies to date.

RespireRx is developing a pipeline of new drug products based on our broad patent portfolios across two distinct drug platforms:

(i) our pharmaceutical cannabinoids platform (which we refer to as ResolutionRx), including dronabinol (a synthetic form of Δ9-tetrahydrocannabinol ("Δ9-THC")), which acts upon the nervous system's endogenous cannabinoid receptors, and

(ii) our neuromodulators platform (which we refer to as EndeavourRx) is made up of two programs: (a) our AMPAkines program, including proprietary compounds that are positive allosteric modulators ("PAMs") of AMPA-type glutamate receptors to promote neuronal function and (b) our GABAkines program, including proprietary compounds that are PAMs of $GABA_A$ receptors, which was established pursuant to our entry with the University of Wisconsin-Milwaukee Research Foundation, Inc., an affiliate of the University of Wisconsin-Milwaukee ("UWMRF"), into a patent license agreement (the UWMRF Patent License Agreement").

Financing our Platforms

We anticipate filing a Form 1-A with the SEC, which if qualified would enable the Company to engage in a Regulation A offering (Reg A Offering). We provide no assurance that we will file a Form 1-A, or if filed that the Reg A Offering would be qualified, or if qualified, would result in a financing on terms as to price per share or other securities offered, amount of funds raised or other terms acceptable to the Company or at all. Our major challenge has been to raise substantial equity or equity-linked financing to support research and development plans for our cannabinoid and neuromodulator platforms, while minimizing the dilutive effect to pre-existing stockholders. At present, we believe that we are hindered primarily by our public corporate structure, our OTCQB listing, and low market capitalization as a result of our low stock price. For this reason, the Company has effected an internal restructuring plan through which our two drug platforms have been reorganized into separate businesses units, and may, in the future, be spun out into subsidiaries.

We believe that by creating one or more subsidiaries to further the aims of Project ResolutionRx and Project EndeavourRx, it may be possible, through separate finance channels, to optimize the asset values of each.

For a more detailed discussion of our Cannabinoid and Neuromodulator programs, see subsections I and II under Item 1 – Business above.

Recent Developments

UIC Extension

UIC has granted the Company an extension of the due date for the payment of the minimum annual royal obligation of $100,000 that was originally due on December 31, 2020 until April 19, 2021. The amount due to UIC was paid in full on April 1, 2021.

UWM Research Foundation Option Agreement

On August 1, 2020, RespireRx exercised its option pursuant to its option agreement dated March 2, 2020, between RespireRx and UWM Research Foundation, an affiliate of the University of Wisconsin-Milwaukee (“UWMRF”). Upon exercise RespireRx and UWMRF executed the UWMRF Patent License Agreement effective August 1, 2020 pursuant to which RespireRx licensed the identified intellectual property.

Under the UWMRF Patent License Agreement, the Company has an exclusive license to commercialize GABAkine products based on UWMRF’s rights in certain patents and patent applications, and a non-exclusive license to commercialize products based on UWMRF’s rights in certain technology that is not the subject of the patents or patent applications. UWMRF maintains the right to use, and, upon the approval of the Company, to license, these patent and technology rights for any non-commercial purpose, including research and education. The UWMRF Patent License Agreement expires upon the later of the expiration of the Company’s payment obligations to UWMRF or the expiration of the last remaining licensed patent granted thereunder, subject to early termination upon the occurrence of certain events. The License Agreement also contains a standard indemnification provision in favor of UWMRF and confidentiality provisions obligating both parties.

Conversions of Convertible Notes

See Note 4. Notes Payable – Convertible Notes Payable in the Notes to Consolidated Financial Statements for the years ended December 31, 2020 and 2019, included with this report for a detailed description of the terms of, and accounting for, the above-referenced convertible notes.

Forgiveness of Accrued Compensation and Related Costs

On March 22, 2020, two executive officers forgave an aggregate of $306,000 ($153,000 each) of accrued compensation and related costs and received 900,000 (450,000 each) shares of common stock.

On July 13, 2020, two executive officers forgave an aggregate of $1,100,000 of accrued unpaid compensation in exchange for 1,100 shares of Series H 2% Voting, Non-Participating Convertible Preferred Stock ("Series H Preferred Stock"). On September 30, 2020, three executive officers forgave $278,218 of accrued unpaid compensation for 278.218 shares of Series H Preferred Stock. On September 30, 2020, a portion of accounts payable due to two vendors totaling $241,109 for 241.10948 shares of Series H Preferred Stock. On September 30, 2020, all holders of Series H Preferred Stock converted 100% of the Series H Preferred Stock inclusive of accrued unpaid dividends, converted all of their Series H Preferred Stock into 25,377,426 shares of Common Stock and 25,377,426 common stock purchase warrants, both reflected on a post-reverse stock split basis, which reverse stock split occurred on January 5, 2021. As of December 31, 2020, there is no Series H preferred Stock outstanding.

Complaint and Summons

Sharp Settlement Agreement and related Complaint

See Item 3. Legal Proceedings for detailed information about the status of the Sharp Settlement Agreement and the related complaint.

Salamandra

See Item 3. Legal Proceedings for detailed information about the status of the Salamandra settlement agreement.

Recent Accounting Pronouncements

For a description of recent accounting pronouncements, see Note 3-Summary of Significant Accounting Policies-*Recent Accounting Pronouncements* to the consolidated financial statements for the fiscal years ended December 31, 2020 and 2019, included with this report.

Concentration of Risk

Financial instruments that potentially subject the Company to concentrations of credit risk consist primarily of cash and cash equivalents. The Company limits its exposure to credit risk by investing its cash with high credit quality financial institutions.

The Company's research and development efforts and potential products rely on licenses from research institutions and if the Company loses access to these technologies or applications, its business could be substantially impaired.

Through the merger with Pier, the Company gained access to the 2007 License Agreement that Pier had entered into with the University of Illinois on October 10, 2007. The 2007 License Agreement covered certain patents and patent applications in the United States and other countries claiming the use of certain compounds referred to as cannabinoids for the treatment of sleep related breathing disorders (including sleep apnea), of which dronabinol is a specific example of one type of cannabinoid. The 2007 License Agreement was terminated effective March 21, 2013 and on June 27, 2014, the Company entered into the 2014 License Agreement with the University of Illinois, the material terms of which were similar to the 2007 License Agreement that had been terminated and also included the assignment of rights to the University of Illinois, to certain patent applications filed by RespireRx.

The Company received an extension of time to make a $100,000 payment that would have been due on December 31, 2020. The payment date has been extended to April 19, 2021 and was paid in full by the Company on April 1, 2021 (See Note 9 – Commitments and Contingencies – Significant Agreements and Contracts – University of Illinois 2014 Exclusive License Agreement in notes to the consolidated financial statements as of December 31, 2020 and 2019, included with this report).

Critical Accounting Policies and Estimates

SEC guidance defines Critical Accounting Estimates as those estimates made in accordance with GAAP that involve a significant level of estimation uncertainty and have had or are reasonably likely to have a material impact on the financial condition or results of operation of the registrant. These items require the application of management's most difficult, subjective or complex judgments, often because of the need to make estimates about the effect of matters that are inherently uncertain and that may change in subsequent periods. In preparing our consolidated financial statements in accordance with GAAP, management has made estimates, assumptions and judgments that affect the reported amounts of assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting periods.

In preparing these financial statements, management has utilized available information, including our past history, industry standards and the current and projected economic environment, among other factors, in forming its estimates, assumptions and judgments, giving due consideration to materiality. Because the use of estimates is inherent in GAAP, actual results could differ from those estimates. In addition, other companies may utilize different estimates, which may impact comparability of our results of operations to those of companies in similar businesses. A summary of the accounting estimates that management believes are critical to the preparation of our consolidated financial statements is set forth below. See Note 3 in the notes to consolidated financial statements as of December 31, 2020 for additional disclosures regarding our significant accounting policies.

Stock-Based Compensation and Awards

The Company periodically issues common stock and stock options to officers, directors and consultants for services rendered. Such issuances vest and expire according to terms established at the issuance date of each grant.

The Company accounts for stock-based payments to officers, directors, outside consultants and vendors by measuring the cost of services received in exchange for equity awards based on the grant date fair value of the awards, with the cost recognized as compensation expense on the straight-line basis in the Company's consolidated financial statements over the vesting period of the awards.

The fair value of stock options granted as stock-based payments is determined utilizing the Black-Scholes option-pricing model, and is affected by several variables, the most significant of which are the life of the equity award, the exercise price of the stock option as compared to the fair market value of the common stock on the grant date, and the estimated volatility of the common stock over the term of the equity award. Estimated volatility is based on the historical volatility of the Company's common stock. The risk-free interest rate is based on the U.S. Treasury yield curve in effect at the time of grant. The fair market value of common stock is determined by reference to the quoted market price of the Company's common stock.

Stock grants, which are sometimes subject to time-based vesting, are measured at the grant date fair value and charged to operations ratably over the vesting period.

Stock options and warrants issued to non-employees as compensation for services to be provided to the Company or in settlement of debt are accounted for based upon the fair value of the services provided or the estimated fair value of the stock option or warrant, whichever can be more clearly determined. Management uses the Black-Scholes option-pricing model to determine the fair value of the stock options and warrants issued by the Company. The Company recognizes this expense over the period in which the services are provided.

Research and Development Costs

Research and development costs consist primarily of fees paid to consultants and outside service providers and organizations (including research institutes at universities) and other expenses relating to the acquisition, design, development and testing of the Company's treatments and product candidates. Research and development costs include salaries of our officers who also perform administrative duties for the Company. Management makes an allocation of those salaries to research and development based on estimates of time spent on those activities.

Research and development costs incurred by the Company under research grants are expensed as incurred over the life of the underlying contracts, unless the terms of the contract indicate that a different expensing schedule is more appropriate.

The Company reviews the status of its research and development contracts on a quarterly basis.

License Agreements

Obligations incurred with respect to mandatory payments provided for in license agreements are recognized ratably over the appropriate period, as specified in the underlying license agreement, and are recorded as liabilities in the Company's consolidated balance sheet, with a corresponding charge to research and development costs in the Company's consolidated statement of operations. Obligations incurred with respect to milestone payments provided for in license agreements are recognized when it is probable that such milestone will be reached and are recorded as liabilities in the Company's consolidated balance sheet, with a corresponding charge to research and development costs in the Company's consolidated statement of operations. Payments of such liabilities are made in the ordinary course of business.

Patent Costs

Due to the significant uncertainty associated with the successful development of one or more commercially viable products based on the Company's research efforts and any related patent applications, all patent costs, including patent-related legal and filing fees, are expensed as incurred and, in accordance with generally accepted accounting principles, are charged to general and administrative expenses.

Results of Operations

The Company's consolidated statements of operations as discussed herein are presented below.

	Years Ended December 31,	
	2020	2019
Operating expenses:		
General and administrative, including $1,230,370 and $485,332 to related parties for the years ended December 31, 2020 and 2019, respectively	$ 2,676,860	$ 1,137,175
Research and development, including $490,850 and $490,908 to related parties for the years ended December 31, 2020 and 2019, respectively	638,275	599,329
Total operating costs and expenses	3,315,135	1,736,504
Loss from operations	(3,315,135)	(1,736,504)
Loss on extinguishment of debt and other liabilities in exchange for equity	(389,902)	-
Interest expense, including $11,329 and $60,135 to related parties for the years ended December 31, 2020 and 2019, respectively	(545,675)	(404,661)
Foreign currency transaction (loss) gain	(50,499)	26,132
Net loss	$ (4,301,211)	$ (2,115,033)
Deemed dividends from warrant anti-dilution provisions	$ (1,440,214)	$ -
Net loss attributable to common shareholders	$ (5,714,425)	$ (2,115,033
Net loss per common share - basic and diluted respectively (reflected on a post 10 for 1 reverse stock split basis which occurred on January 5, 2021)	$ (0.22)	$ (5.41
Weighted average common shares outstanding - basic and diluted – post-reverse split basis	25,855,664	390,848

Years Ended December 31, 2020 and 2019

Revenues. During the year ended December 31, 2020 and 2019, the Company had no revenues.

General and Administrative. For the year ended December 31, 2020, general and administrative expenses were $2,676,860, an increase of $1,539,685, as compared to $1,137,175 for the year ended December 31, 2019.

Stock-based compensation costs and fees included in general and administrative expenses were $345,500 for the year ended December 31, 2020, as compared to $0 for the year ended December 31, 2019, reflecting an increase of $345,500. The increase is the result stock option grants to general and administrative employees and consultants and service providers of the Company during the year ended December 31, 2020. Salaries included in general and administrative expenses were $693,676 for the year ended December 31, 2020 as compared to $300,000 for the year ended December 31, 2019, an increase of $393,676. The increase is primarily due to engagement of Timothy Jones as CEO and President commencing on May 6, 2020 and the accrual of salary and a scheduled bonus. Legal fees for general corporate purposes were $859,258 for the year ended December 31, 2020 as compared to $213,289 for the year ended December 31, 2019, an increase of $645,969 related to periodic filings with the SEC in the ordinary course of business, advise and research with respect to our planned securities offering pursuant to Regulation A, settlement negotiations with certain vendors, fees associated with our entering into first the option agreement and then the license agreement with UWMRF (as herein defined) and other general corporate matters. Legal fees associated with our filing of a Form S-1 registration statement and its becoming effective resulting in financings associated with our equity line have been charged against Additional paid-in capital as a cost of the financing to the extent such completed financings occurred in 2020 and have been recorded as a deferred financing cost, a current asset, on our consolidated balance sheet as of December 31, 2020. Legal fees for patents and other patent expenses included in general and administrative expenses were $213,916 for the year ended December 31, 2020, an increase of $66,194 as compared to $147,722 for the year ended December 31, 2019. The increase in legal fees associated with patents and other patent costs is a result of an increase in patent related activities with respect to the UWMRF licensed assets as well as foreign fees, patent maintenance fees and other patent related activities.

Research and Development. For the year ended December 31, 2020, research and development expenses were $638,275, an increase of $38,946 as compared to $599,329 for the year ended December 31, 2019, primarily due to the addition of several consultants offset by the decrease in the utilization of one consultant.

Loss on Extinguishment of Debt and other Liabilities in Exchange for Equity. The loss on extinguishment of debt or other liabilities for the year ended December 31, 2020 was $389,902 as compared to $0 for the year ended December 31, 2019. The loss is attributable to the exchange of certain notes for Common Stock and the payment of certain liabilities to vendors with Common Stock in 2020 as compared to no such transactions occurring in 2019.

Interest Expense. During the year ended December 31, 2020, interest expense was $545,675 (including $11,3429 to related parties), an increase of $141,014, as compared to $404,661 (including $60,135 to related parties) for the year ended December 31, 2019. The increase in interest expense resulted primarily from interest on five new convertible notes issued from April, June and July 2020 totaling $348,500 of principal amount in 2020, plus partial year interest on convertible notes from 2019 until paid in full and additional interest with respect to the Salamandra legal settlement. Also included in interest expense is the amortization of note discounts.

Foreign Currency Transaction Loss or Gain. The foreign currency transaction loss was $50,499 for the year ended December 31, 2020, as compared to a foreign currency transaction gain of $26,132 for the year ended December 31, 2019. The foreign currency transaction loss or gain relates to the $399,774 loan from SY Corporation Co., Ltd., formerly known as Samyang Optics Co. Ltd. (“SY Corporation”), made in June 2012, which is denominated in the South Korean Won.

Net Loss. For the year ended December 31, 2020, the Company incurred a net loss of $4,301,211, as compared to a net loss of $2,115,033 for the year ended December 31, 2019.

Liquidity and Capital Resources

Working Capital and Cash

The Company’s consolidated financial statements have been presented on the basis that it is a going concern, which contemplates the realization of assets and satisfaction of liabilities in the normal course of business. The Company has incurred net losses of $4,301,210 for the fiscal year ended December 31, 2020 and $2,115,033 for the fiscal year ended December 31, 2019, and negative operating cash flows of $513,001 and $487,745 for the fiscal years ended December 31, 2020 and 2019 respectively. The Company had a stockholders’ deficiency of $8,063,320 as of December 31, 2020 and expects to continue to incur net losses and negative operating cash flows for at least the next few years. As a result, management has concluded that there is substantial doubt about the Company’s ability to continue as a going concern. In addition, the Company’s independent registered public accounting firm, in its report on the Company’s consolidated financial statements for the year ended December 31, 2020, has expressed substantial doubt about the Company’s ability to continue as a going concern (see “Going Concern” below).

At December 31, 2020, the Company had a working capital deficit of $8,063,320, as compared to a working capital deficit of $7,444,819 at December 31, 2019, reflecting an increase in the working capital deficit of $618,501 for the fiscal year ended December 31, 2020. This increase is comprised of an increase in total current liabilities of $658,260, offset by an increase in current assets of $39,759. The increase in total current liabilities consists of a net increase in accounts payable and accrued expenses of $1,211,417, decrease in accrued compensation and related expenses of $543,032, a decrease in convertible notes payable of $107,090, an increase in the note payable to SY Corporation of $98,315 and an increase in notes payable to officers and former officers of $28,317.

At December 31, 2020, the Company had cash aggregating $825 as compared to $16,690 at December 31, 2019, reflecting a decrease in cash of $15,865 during the fiscal year ended December 31, 2019.

Operating Activities

For the fiscal year ended December 31, 2020, operating activities utilized cash of $513,001 as compared to utilizing cash of $487,745 for the fiscal year ended December 31, 2019, to support the Company’s ongoing operations and research and development activities.

Financing Activities

For the fiscal year ended December 31, 2020, financing activities consisted of five convertible note financings and an equity line.

The Company and PowerUp Lending Group Ltd. ("PowerUp") entered into Securities Purchase Agreements, dated as of April 15, 2020 and June 7, 2020 (each, a "PowerUp Agreement"), by which PowerUp loaned $53,000 and $43,000, respectively, to the Company in return for two convertible promissory notes (the "April 2020 Note" and the "June 2020 Note" respectively). The proceeds of the loans, which equal $90,000 after payment of $5,000 in legal fees and $1,000 in due diligence fees, were used for general corporate purposes.

The April 2020 Note and the June 2020 Note were repaid in full inclusive of principal or interest at 12% per year by conversion of the Notes into Common Stock on October 22, 2020, October 23, 2020, October 26, 2020, December 14, 2020 and December 15, 2020. The conversions resulted in the issuance by the Company of 5,586,895 shares of Common Stock (post-reverse stock split basis).

On July 2, 2020, the Company and FirstFire Global Opportunities Fund LLC ("FirstFire") entered into a Securities Purchase Agreement (the "FirstFire SPA") pursuant to which FirstFire provided a sum of $125,000 (the "FirstFire Consideration") to the Company, in return for a convertible promissory note (the "FirstFire Note") with a face amount of $137,500 (which difference in value as compared to the FirstFire Consideration is due to an original issue discount of $12,500), a common stock purchase warrant for 687,500 shares of Common Stock (post-reverse stock split basis (the "FirstFire Warrant"), and a confession of judgment, among other agreements and obligations. The net proceeds of the First Fire Consideration, which were received by the Company on July 6, 2020, equal $121,000 after payment of $4,000 in FirstFire's legal fees.

The FirstFire Note was paid in full inclusive of principal and interest at 10% per annum by conversion into the Company's Common Stock on January 19, 2021, February 4, 2021, February 16, 2021 and March 3, 2021. The conversions resulted in the issuance by the Company of 7,218,750 shares of Common Stock (post-reverse stock split basis). See Note 10 – Subsequent Events in the notes to our consolidated financial statements as of December 31, 2020.

On July 28, 2020, the Company issued a convertible note, as amended ("Commitment Note") to White Lion Capital, LLC ("White Lion") pursuant to, and to induce White Lion to enter into an equity purchase agreement dated July 28, 2020 ("White Lion EPA"). See Note 9 - Commitments and Contingencies - *Entry into Equity Purchase Agreement* to our consolidated financial statements as of December 31, 2020 for a description of the White Lion EPA and the other agreements entered into pursuant to the White Lion EPA. The Commitment Note had an initial face amount of $25,000 which was subsequently amended effective July 28, 2020 to $40,000 in consideration for an amendment to the White Lion EPA extending the date by which the Company was to file a registration statement on Form S-1 listing White Lion as the selling stockholder on Form S-1. The Commitment Note was accounted for as equity issuance costs in Additional paid-in capital.

The Commitment Note obligates the Company to pay by July 28, 2021 a principal amount of $40,000, together with a guaranteed interest payment of $3,200 representing an 8% per annum interest rate applied regardless of any payments or prepayments other than payments made by conversion of the Commitment Note. Unless an event of default has occurred, White Lion may convert at a per share conversion price equal to $0.02.

$25,000 of the principal amount of the Commitment Note was paid in part, by conversion into the Company's Common Stock on March 15, 2021. The conversion resulted in the issuance by the Company of 1,250,000 shares of Common Stock (post-reverse stock split basis). See Note 10 – Subsequent Events in the notes to our consolidated financial statements as of December 31, 2020. As of December 31, 2020, there remains $15,000 of principal amount plus accrued interest outstanding.

On July 28, 2020, the Company and White Lion entered into the White Lion EPA and a registration rights agreement (the "White Lion Registration Rights Agreement"). Pursuant to the White Lion EPA, White Lion agreed to invest up to $2,000,000 to purchase Common Stock at a purchase price of 85% of the lowest daily volume weighted average price of Common Stock for the five trading days prior to a given closing date.

Additionally, the Commitment Note described above was issued pursuant to the White Lion EPA and to induce White Lion to execute the White Lion EPA. See Note 4. Notes Payable—*Convertible Notes Payable*—Q3 2020 Convertible Notes—*Convertible Note and Equity Purchase Agreement with White Lion Capital, LLC*.

Pursuant to the Registration Rights Agreement, RespireRx is obligated to register for resale under the Securities Act the shares of Common Stock to be issued and sold to White Lion pursuant to the White Lion EPA. On October 14, 2020, Respire Rx filed a registration statement on Form S-1 with respect to the resale of up to 11,500,000 of the shares of Common Stock (post-reverse stock split basis) to be issued and sold to White Lion pursuant to the White Lion EPA, and on October 29, 2020, the registration statement became effective. The registration statement does not necessarily represent all shares that may be sold to White Lion in order to fulfill its purchase commitment of $2,000,000 under the White Lion EPA.

On October 28, 2020, November 13, 2020, December 1, 2020 and February 19, 2021, the Company sent purchases notices to White Lion. The three purchase notices pursuant to which White Lion was required to purchase shares of Common Stock, in the fourth quarter of 2020, were for an aggregate 7,900,000 shares and resulted in net proceeds after closing costs of 8,235, of an aggregate of $162,886. The one purchase notice on February 19, 2021 was for 3,600,000 shares of Common Stock resulting in net proceeds after closing costs of $2,070 aggregating $115,229. The total of all shares sold pursuant to purchase notices is 11,500,000 which is all of the shares registered and offered for sale is the registration statement on Form S-1 that became effective on October 29, 2020. There are no shares available for sale under that registration statement. In order for the Company to issue additional purchase notices to White Lion, the Company would either have to file a new registration statement or amend the current registration statement covering shares representing any remaining amounts available under the White Lion EPA, or up to $1,711,581. See Note 10. Subsequent Events - *Issuances of Common Stock – White Lion Capital LLC*.

The White Lion EPA terminates on the earlier of (i) June 30, 2021, (ii) the date on which White Lion has purchased $2,000,000 of Common Stock, (iii) the date on which the White Lion Registration Rights Agreement is no longer in effect, (iv) upon White Lion's material breach of the White Lion EPA, (v) in the event a voluntary or involuntary bankruptcy petition is filed with respect to the Company, or (vi) if a custodian is appointed for the Company for all or substantially all of its property or the Company makes a general assignment for the benefit of its creditors.

On July 30, 2020, the Company and EMA Financial, LLC ("EMA") entered into a Securities Purchase Agreement (the "EMA SPA") by which EMA provided a sum of $68,250 (the "EMA Consideration") to RespireRx, in return for a fixed rate convertible note (the "EMA Note") with a face amount of $75,000, and a common stock purchase warrant (the "EMA Warrant") for 375,000 shares of Common Stock (post-reverse stock split basis). The net proceeds received by RespireRx on August 4, 2020 were $63,750 after payment of $3,500 in EMA's legal fees and the withholding by EMA of $1,000 in diligence fees.

The EMA Note obligates RespireRx to pay by October 30, 2021 (the "EMA Maturity Date") a principal amount of $75,000 together with interest at a rate equal to 10% per annum, which principal exceeds the EMA Consideration by the amount of an original issue discount of $6,750.

The EMA Warrant is a common stock purchase warrant to purchase 375,000 shares of Common Stock, for value received in connection with the issuance of the EMA Note, from the date of issuance of the EMA Warrant until September 30, 2023, at an exercise price of $0.07 (post-reverse stock split basis and subject to adjustment as provided therein) per share of Common Stock.

The EMA Note was paid in full inclusive of principal and interest at 10% per annum by conversion into the Company's Common Stock on February 4, 2021, February 10, 2021, February 12, 2021 and March 3, 2021. The conversions resulted in the issuance by the Company of 4,156,807 shares of Common Stock (post-reverse stock split basis). See Note 10. Subsequent Events in the notes to our consolidated financial statements as of December 31, 2020.

The Company has engaged in additional convertible note financings in 2021 and may continue to do so. The Company is planning an equity securities offering pursuant to Regulation A in 2021 as well and will continue to consider additional forms of debt, equity and strategic partner financing throughout 2021.

Going Concern

The Company's consolidated financial statements have been presented on the basis that it is a going concern, which contemplates the realization of assets and satisfaction of liabilities in the normal course of business. The Company has incurred net losses of $4,301,210 for the fiscal year ended December 31, 2020 and $2,115,033 for the fiscal year ended December 31, 2019, and negative operating cash flows of $513,001 and $487,745 for the fiscal years ended December 31, 2020 and 2019, respectively. The Company had a stockholders' deficiency of $8,063,320 at December 31, 2020 and expects to continue to incur net losses and negative operating cash flows for at least the next few years. As a result, management has concluded that there is substantial doubt about the Company's ability to continue as a going concern, and the Company's independent registered public accounting firm, in its report on the Company's consolidated financial statements for the year ended December 31, 2020, expressed substantial doubt about the Company's ability to continue as a going concern.

The Company is currently, and has for some time, been in significant financial distress. It has limited cash resources and current assets and has no ongoing source of sustainable revenue. Management is continuing to address various aspects of the Company's operations and obligations, including, without limitation, debt obligations, financing requirements, intellectual property, licensing agreements, legal and patent matters and regulatory compliance, and has continued to raise new debt and equity capital to fund the Company's business activities from both related and unrelated parties.

The Company is continuing its efforts to raise additional capital in order to be able to pay its liabilities and fund its business activities on a going forward basis, including the pursuit of the Company's planned research and development activities. We anticipate filing a Form 1-A with the SEC, which if qualified would enable the Company to engage in a Regulation A Offering. We provide no assurance that we will file a Form 1-A, or if filed that the Reg A Offering would be qualified, or if qualified, would result in a financing on terms as to price per share or other securities offered, amount of funds raised or other terms acceptable to the Company or at all. The Company regularly evaluates various other measures to satisfy the Company's liquidity needs, including development and other agreements with collaborative partners and, when necessary, seeking to exchange or restructure the Company's outstanding securities. The Company is evaluating certain changes to its operations and structure to facilitating raising capital from sources that may be interested in financing only discrete aspects of the Company's development programs. Such changes could include a significant reorganization, which may include the formation of one or more subsidiaries into which one or more programs may be contributed. As a result of the Company's current financial situation, the Company has limited access to external sources of debt and equity financing. Accordingly, there can be no assurances that the Company will be able to secure additional financing in the amounts necessary to fully fund its operating and debt service requirements. If the Company is unable to access sufficient cash resources, the Company may be forced to discontinue its operations entirely and liquidate.

Principal Commitments

Employment Agreements

Effective on May 6, 2020, Timothy Jones was appointed as RespireRx's President and Chief Executive Officer and entered into an employment agreement as of that date. See Note 9 – Commitments and Contingencies – Significant Agreements and Contracts – Employment Agreements to the consolidated financial statements as of December 31, 2020.

Effective May 6, 2020, with the appointment of Timothy Jones as RespireRx's President and Chief Executive Officer, Dr. Lippa resigned the interim officer positions of Interim Chief Executive Officer and Interim President, positions that Dr. Lippa had assumed on October 12, 2018 after the resignation of Dr. James Manuso on September 30, 2018. Dr. Lippa continues to serve as RespireRx's Executive Chairman and as a member of the Board of Directors as well as the Company's Chief Scientific Officer. See Note 9 – Commitments and Contingencies – Significant Agreements and Contracts – Employment Agreements to the consolidated financial statements as of December 31, 2020.

Jeff E. Margolis currently serves as the Company's Senior Vice President, Chief Financial Officer, Treasurer and Secretary. See Note Note 9 – Commitments and Contingencies – Significant Agreements and Contracts – Employment Agreements to the consolidated financial statements as of December 31, 2020.

Consulting Agreements

David Dickason

The Company entered into a consulting contract with David Dickason effective September 15, 2020 pursuant to which Mr. Dickason was appointed to and serves as the Company's Senior Vice President of Pre-Clinical Product Development on an at-will basis at the rate of $250 per hour. See Note 9. Commitments and Contingencies – Significant Agreements and Contracts – Consulting Agreements to the consolidated financial statements as of December 31, 2020.

DNA Healthlink, Inc. and Richard Purcell

Richard Purcell, the Company's Senior Vice President of Research and Development since October 15, 2014, provides his services to the Company on a month-to-month basis through his consulting firm, DNA Healthlink, Inc., through which the Company has contracted for his services, for a monthly cash fee of $12,500. See Note 9. Commitments and Contingencies – Significant Agreements and Contracts – Consulting Agreements to the consolidated financial statements as of December 31, 2020.

University of Illinois 2014 Exclusive License Agreement

On June 27, 2014, the Company entered into an Exclusive License Agreement (the "2014 License Agreement") with the University of Illinois, the material terms of which were similar to a License Agreement between the parties that had been previously terminated on March 21, 2013. The 2014 License Agreement became effective on September 18, 2014. See Note 9. Commitments and Contingencies – Significant Agreements and Contracts – University of Illinois 2014 Exclusive License Agreement to the consolidated financial statements as of December 31, 2020.

Noramco Inc. - Dronabinol Development and Supply Agreement

On September 4, 2018, RespireRx entered into a dronabinol Development and Supply Agreement with Noramco Inc., one of the world's major dronabinol manufacturers, which was subsequently assigned by Noramco to its subsidiary, Purisys LLC. See Note 9. Commitments and Contingencies – Significant Agreements and Contracts – Normaco Inc. – Dronabinol Development and Supply Agreement to the consolidated financial statements as of December 31, 2020.

UWM Research Foundation

On August 1, 2020, RespireRx exercised its option pursuant to its option agreement dated March 2, 2020, between RespireRx and UWM Research Foundation, an affiliate of the University of Wisconsin-Milwaukee ("UWMRF"). Upon exercise RespireRx and UWMRF executed the UWMRF Patent License Agreement effective August 1, 2020 pursuant to which RespireRx licensed the identified intellectual property. Note 9. Commitments and Contingencies – Significant Agreements and Contracts – UWMRF Patent License Agreement to the consolidated financial statements as of December 31, 2020.

Transactions with Biovail Laboratories International SRL

Beginning in March 2010, the Company entered into a series of asset purchase and license agreements with Biovail Laboratories International SRL later merged with Valeant Pharmaceuticals International, Inc. which was later renamed Bausch Health Companies Inc. ("Biovail").

In March 2011, the Company entered into a new agreement with Biovail to reacquire the ampakine compounds, patents and rights that Biovail had acquired from the Company in March 2010.

See Note 9. Commitments and Contingencies – Significant Agreements and Contracts – Transactions with BioVail Laboratories International SRL to the consolidated financial statements as of December 31, 2020.

Summary of Principal Cash Obligations and Commitments

The following table sets forth the Company's principal cash obligations and commitments for the next five fiscal years as of December 31, 2020, aggregating $2,885,270. Employment agreement amounts included in the 2021 column represent amounts contractually due from January 1, 2021 through September 30, 2021 or in one case, September 30, 2023 when such contracts expire unless extended pursuant to the terms of the contracts.

		Payments Due By Year				
	Total	2021	2022	2023	2024	2025
License agreements	$ 560,370	$ 100,000	$115,092	$115,093	$130,185	$100,000
Employment agreements (1)	2,294,900	1,100,600	639,600	554,700	-	-
Total	$2,855,270	$1,200,600	$754,692	$669,793	$130,185	$100,000

(1) The payment of certain of such amounts has been deferred indefinitely, as described above in "Employment Agreements".

Off-Balance Sheet Arrangements

At December 31, 2020, the Company did not have any transactions, obligations or relationships that could be considered off-balance sheet arrangements.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Not applicable for smaller reporting companies.

Item 8. Financial Statements and Supplementary Data

Our financial statements and other information required by this item are set forth herein in a separate section beginning with the Index to Consolidated Financial Statements on page F-1.

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

Not applicable.

Item 9A. Controls and Procedures

Disclosure Controls and Procedures

The Company maintains disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act") that are designed to ensure that information required to be disclosed in the reports that the Company files with the Securities and Exchange Commission (the "SEC") under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and that such information is accumulated and communicated to the Company's management, including its Chief Executive Officer and Chief Financial Officer, to allow for timely decisions regarding required disclosures.

The Company carried out an evaluation, under the supervision and with the participation of its management, consisting of its principal executive officer and principal financial officer, of the effectiveness of the Company's disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) of the Exchange Act). Based upon that evaluation, the Company's principal executive officer and principal financial officer concluded that, as of the end of the period covered in this Annual Report on Form 10-K, the Company's disclosure controls and procedures were not effective to ensure that information required to be disclosed in reports filed under the Exchange Act is recorded, processed, summarized and reported within the required time periods and is accumulated and communicated to the Company's management, consisting of the Company's principal executive officer and principal financial officer, to allow timely decisions regarding required disclosure.

Management has been focusing on developing replacement controls and procedures that are adequate to ensure that information required to be disclosed in reports filed under the Exchange Act is recorded, processed, summarized and reported within the required time periods and is accumulated and communicated to the Company's management to allow timely decisions regarding required disclosure. The Company is current in its SEC periodic reporting obligations, but as of the date of the filing of this Annual Report on Form 10-K, the Company had not yet established adequate internal controls over financial reporting.

The Company's management, consisting of its principal executive officer and principal financial officer, does not expect that its disclosure controls and procedures or its internal controls will prevent all error or 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. Furthermore, 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. Due to 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, have been detected. In addition, as conditions change over time, so too may the effectiveness of internal controls. However, management believes that the financial statements included in this Annual Report on Form 10-K fairly present, in all material respects, the Company's financial condition, results of operations and cash flows for the periods presented.

Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. Our internal control over financial reporting is designed to ensure that material information regarding our operations is made available to management and the board of directors to provide them reasonable assurance that the published financial statements are fairly presented. There are limitations inherent in any internal control, such as the possibility of human error and the circumvention or overriding of controls. As a result, even effective internal controls can provide only reasonable assurance with respect to financial statement preparation. As conditions change over time so too may the effectiveness of internal controls.

Our management, consisting of our Chief Executive Officer, our Chief Scientific Officer and our Chief Financial Officer, has evaluated our internal control over financial reporting as of December 31, 2020 based on the 2013 Internal Control – Integrated Framework issued by the Committee of Sponsoring Organizations ("COSO") of the Treadway Commission. Based on this assessment, and taking into account the operating structure of the Company, our management has concluded that material weaknesses in the Company's internal control over financial reporting existed as of December 31, 2020, as a result of which our internal control over financial reporting was not effective at December 31, 2020.

Within the constraints of the Company's limited financial resources and as of the date of the filing of this Annual Report on Form 10-K, the Company has not yet completed this process of reestablishing adequate internal controls over financial reporting.

This Annual Report on Form 10-K does not include an attestation report of the Company's independent registered public accounting firm regarding internal control over financial reporting. Management's report was not subject to attestation by the Company's independent registered public accounting firm pursuant to rules of the SEC that permit the Company to provide only management's report in this Annual Report on Form 10-K.

Changes in Internal Control over Financial Reporting

The Company's management, consisting of its principal executive officer and principal financial officer, has determined that no change in the Company's internal control over financial reporting (as that term is defined in Rules 13(a)-15(f) and 15(d)-15(f) of the Securities Exchange Act of 1934) occurred during or subsequent to the fourth quarter of the year ended December 31, 2020 that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting.

Item 9B. Other Information

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

Directors

As of the date of the filing of this Annual Report on Form 10-K, the names of each of the directors and certain biographical information about them are set forth below. Each of our directors serves until his or resignation or until a successor is appointed.

Name	Age	Director Since	Principal Occupation
Arnold S Lippa, Ph.D.	74	2013	Chief Scientific Officer and Chairman of the Board of the of Directors
Jeff E. Margolis	65	2013	Senior Vice President, Chief Financial Officer, Treasurer and Secretary and a Director of the Company and President of Aurora Capital LLC, an investment banking and securities brokerage firm
Kathryn MacFarlane, PharmD	55	2014	Director of the Company and Owner and Managing Partner of SmartPharma LLC, a consulting firm
Timothy Jones	47	2020	President and Chief Executive Officer and a Director of the Company.

Arnold S. Lippa, Ph.D.: Dr. Lippa is a Senior Managing Director and founder of T Morgen Capital LLC through which he administers his family's assets. T Morgen Capital LLC is a significant equity owner and managing member of Aurora Capital LLC ("Aurora"), a boutique investment bank and securities firm of which Mr. Margolis is the president and founder, which has served as a placement agent with respect to certain of the Company's prior financings. Dr. Lippa and Mr. Margolis jointly manage, since 2004, Atypical BioCapital Management LLC and Atypical BioVentures Fund LLC, a life sciences fund management company and venture fund, respectively. Since 2006, Dr. Lippa has also been the Executive Chairman of the board of Xintria Pharmaceutical Corporation, a Delaware corporation, as well as a member of its board of directors. Dr. Lippa is a member of the Board of Directors of Hepion Pharmaceuticals, Inc. since December 2015 where he is a member of the audit committee, the compensation committee and the Corporate Governance/Nominating Committee. Dr. Lippa was co-founder of DOV Pharmaceutical, Inc., where he served as Chairman of the Board and Chief Executive Officer from its inception in 1995 through 2005. Dr. Lippa stepped down as a director of DOV Pharmaceuticals, Inc. in 2006.

We believe that Dr. Lippa's qualifications to serve on our Board include his current positionsof Chief Scientific Officer, his former positions and Interim Chief Executive Officer and Interim President and Chief Executive Officer and President, and his experience working in management roles in other pharmaceutical companies as described above. We also believe that Dr. Lippa's qualifications also include his experiences as a financier of both biopharmaceutical and other companies. Dr. Lippa provides the Board with both technical and scientific expertise in drug discovery and drug development, research management, governmental regulations and strategic planning expertise that is important to the advancement of our research platforms as well as to the overall success of the Company. Dr. Lippa was appointed to our board of directors in March 2013.

Jeff E. Margolis: Mr. Margolis is the president and founder of Aurora and has been since its inception in 1994. Aurora Capital Corp., a corporation wholly owned by Mr. Margolis, is a significant equity owner and managing member of Aurora. Dr. Lippa and Mr. Margolis jointly manage, since 2004, Atypical BioCapital Management LLC and Atypical BioVentures Fund LLC, a life sciences fund management company and venture fund, respectively. Since 2006, Mr. Margolis has also been the Chief Financial Officer of Xintria Pharmaceutical Corporation, a Delaware corporation, as well as a member of its board of directors.

We believe that Mr. Margolis's qualifications to serve on our Board include his significant experience in financial, operational and management roles within pharmaceutical companies and within the financial industry as described above. He also has extensive prior experience working in business development and provides the Company with extremely useful expertise in financing and capital markets, knowledge gained though his position as President of Aurora. Mr. Margolis also provides broad financial expertise. Mr. Margolis was appointed to our board of directors in March 2013.

Kathryn MacFarlane, PharmD: Ms. MacFarlane is the co-founder and Managing Partner of SmartPharma, LLC ("SmartPharma"), where she has contracted to serve as the Chief Commercial Officer of Agile Therapeutics and the Sr. Vice President of Commercial Development for Napo Pharmaceuticals. SmartPharma performs market assessments and develops forecasts and commercial plans for pharmaceutical products. Ms. MacFarlane has provided advice to over 75 companies and investors on financing, licensing, and acquisition of drug products and technologies. She is an experienced pharmaceutical executive with over 25 years in the industry, including senior level roles in drug development, marketing, and sales management at Parke-Davis, Pfizer, and Warner Chilcott, where she was the Vice President of Sales, Marketing, and New Product Planning. Ms. MacFarlane played a key role in the launch of several leading brands, most notably Lipitor®, Celexa®, and Loestrin® 24. Ms. MacFarlane earned a B.S. and PharmD from Purdue University and completed a Postdoctoral Fellowship with Rutgers University and Hoffmann-LaRoche. She was named a Distinguished Alumna and was awarded the Eaton Entrepreneur of the Year by the Purdue University School of Pharmacy, where she currently is an Affiliate Faculty member. Ms. MacFarlane is Chairwoman on the Finance Committee for the Board of Directors of INMED Partnerships for Children, and a member of the Executive Committee of the Woodley Park Community Association.

We believe Ms. MacFarlane's qualifications to serve on our Board include both her biopharmaceutical consulting background and her familiarity with the biopharmaceutical regulatory and commercialization environment, as well as the breadth of her technical and therapeutic knowledge, as discussed above. Ms. Macfarlane has also served in numerous senior executive positions at various biopharmaceutical companies. Ms. MacFarlane was appointed to our board of directors in September 2014.

Timothy Jones: Until April 10, 2020 Mr. Jones was the Vice President Global Pharmaceutical and Medical OTC at Purisys, an affiliate of Noramco formed in September 2019. Mr. Jones' experience includes 15 years of API (active pharmaceutical ingredient) sales, business development, and sourcing in the niche, controlled substances space. He is recognized in the industry for his expertise in the strategic development and growth of active pharmaceutical ingredient categories, through partnerships with a broad cross section of brand and generic companies worldwide. His extensive knowledge base and expertise across multiple pharmaceutical disciplines have contributed to his successful track record of financial growth. He previously held leadership roles with QuVa Pharma, Par Sterile Products, and Johnson Matthey.

We believe Mr. Jones' qualifications to serve on our Board include his extensive background in biopharmaceutical business development and supply chain as well as his familiarity with business involving controlled substances, particularly cannabinoid controlled substances, as well as the breadth of his industry network. Mr. Jones has also served in numerous leadership positions at various biopharmaceutical companies. Mr. Jones was appointed to our board of directors in January 2020.

Executive Officers

Each executive officer of the Company serves at the discretion of the Board of Directors. The names of the Company's executive officers are set forth below. At December 31, 2020, each of our executive officers except David Dickason and Richard Purcell was also a member of our board of directors, and the biographical information of those officers appears above in the immediately prior section. See "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations – Principal Commitments – *Employment Agreements*" for information on the term of service for each of Mr. Jones, Dr. Lippa and Mr. Margolis. Mr. Dickason provides his services to the Company on a month-to-month basis pursuant to a consulting agreement with the Company. Mr. Purcell provides his services to the Company on a month-to-month basis through his consulting firm, DNA Healthlink, Inc. for a monthly fee. The contract terms are currently being renegotiated. Additional information with respect to shares of common stock or stock options that have been issued to Mr. Dickason and Mr. Purcell is provided at Note 9 – Commitments and Contingencies – Significant Agreements and Contracts – Consulting Agreements in the Notes to Consolidated Financial Statements for the fiscal years ended December 31, 2020 and 2019, included with this report.

Name	Position with Company
Timothy L. Jones	Chief Executive Officer and President
Arnold S. Lippa, Ph.D.	Chief Scientific Officer and Chairman of the Board
Jeff E. Margolis	Senior Vice President, Chief Financial Officer, Treasurer and Secretary

BOARD COMMITTEES

The board of directors does not maintain any separate standing board committees. Instead, the functions of each of the Audit Committee, the Compensation Committee and the Governance and Nomination Committee have been and are currently being addressed by the full board of directors. This arrangement was initially implemented in 2013 when current management was put in place. At that time there were no independent directors. Since that time, the Company has added two independent directors, both in 2014, however, because of the small size of the Board generally and because the Board includes only two independent directors, the Company has not appointed standing committees.

Audit Committee. The board of directors meets with the Company's independent registered public accountants and management to prepare for and to review the results of the annual audit and to discuss the annual and quarterly financial statements, earnings releases and related matters. The board of directors, among other things, (i) selects and retains the independent registered public accountants, (ii) reviews with the independent registered public accountants the scope and anticipated cost of their audit, and their independence and performance, (iii) reviews accounting practices, financial structure and financial reporting, (iv) receives and considers the independent registered public accountants' comments as to controls, adequacy of staff and management performance and procedures in connection with audit and financial controls, (v) reviews and pre-approves all audit and non-audit services provided to the Company by the independent registered public accountants, and (vi) reviews and pre-approves all related-party transactions. The board of directors does not itself prepare financial statements or perform audits, and its members are not auditors or certifiers of the Company's financial statements.

Since the change in composition of our board of directors in March 2013, the composition of an Audit Committee has not been determined, nor has the current board of directors adopted an amended written charter. When an Audit Committee is reestablished along with a written charter, such charter will be made available on the Company's website at www.respirerx.com.

Compensation Committee. The traditional functions of the Compensation Committee include, without limitation, administering the Company's incentive ownership programs and approving the compensation to be paid to the Company's directors and executive officers. The board of directors acting in the capacity of a Compensation Committee typically meets no less frequently than annually as circumstances dictate to discuss and determine executive officer and director compensation. Historically, the Company's Chief Executive Officer annually reviews the performance of each executive officer (other than the Chief Executive Officer, whose performance is reviewed by the board of directors). The conclusions reached and recommendations based on these reviews, including with respect to salary adjustments and annual award amounts, are presented to the board of directors, which can exercise its discretion in modifying any recommended adjustments or awards to executive officers. The board of directors is entitled to, but generally does not, retain the services of any compensation consultants. Neither the board of directors nor management has engaged a compensation consultant in the past fiscal year.

Since the change in composition of our board of directors in March 2013, the members of the board of directors have performed the functions of a Compensation Committee and the composition of a Compensation Committee has not been determined nor has the current board of directors adopted a written committee charter. When a Compensation Committee is reestablished along with a written charter, such charter will be made available on the Company's website at www.respirerx.com.

Governance and Nominations Committee. The traditional functions of the Governance and Nominations Committee include, without limitation, (i) identifying individuals qualified to become members of the board of directors, (ii) recommending director nominees for the next annual meeting of stockholders and to fill vacancies that may be created by the expansion of the number of directors serving on the board of directors and by resignation, retirement or other termination of services of incumbent directors, (iii) developing and recommending to the board of directors corporate governance guidelines and changes thereto, (iv) ensuring that the board of directors and the Company's Certificate of Incorporation and Bylaws are structured in a way that best serves the Company's practices and objectives, (v) leading the board of directors in its annual review of the board of directors' performance; and (vi) recommending to the board of directors nominees for each committee. Accordingly, the board of directors, acting in the capacity of a Governance and Nominations Committee, annually reviews the composition of the board of directors as a whole and makes recommendations, if deemed necessary, to enhance the composition of the board of directors. The board of directors first considers a candidate's management experience and then considers issues of judgment, background, conflicts of interest, integrity, ethics and commitment to the goal of maximizing stockholder value when considering director candidates. The board of directors also focuses on issues of diversity, such as diversity of gender, race and national origin, education, professional experience and differences in viewpoints and skills. The board of directors does not have a formal policy with respect to diversity; however, the board of directors believes that it is essential that the members of the board of directors represent diverse viewpoints. In considering candidates for the board of directors, the board considers the entirety of each candidate's credentials in the context of these standards. With respect to the nomination of continuing directors for re-election, the individual's contributions to the board of directors are also considered.

Since the change in composition of our board of directors in March 2013, the members of the board of directors have performed the functions of a Governance and Nominations Committee and the composition of a Governance and Nominations Committee has not been determined nor has the current board of directors adopted a written charter. When a Governance and Nominations Committee is reestablished along with a written committee charter, such charter will be made available on the Company's website at www.respirerx.com.

Section 16(a) Beneficial Ownership Reporting Compliance

Section 16(a) of the Exchange Act requires the Company's executive officers and directors and persons who beneficially own more than 10% of the Company's outstanding common stock, whom the Company refers to collectively as the "reporting persons," to file reports of ownership and changes in ownership with the SEC, and to furnish the Company with copies of these reports.

Based solely on the Company's review of the copies of these reports received by it and written representations received from certain of the reporting persons with respect to the filing of reports on Forms 3, 4 and 5, the Company believes that all such filings required to be made by the reporting persons for the fiscal year ended December 31, 2020 were made on a timely basis, except for any Form 3 or Form 4 that may be required for any of the beneficial holders, other than officers and directors, listed in Item 12 in this report and except for a Form 3 with respect to Timothy L. Jones that was not timely filed when he became an insider after his appointment on January 28, 2020 as a director of the Company, which Form 3 was filed late by Mr. Jones on August 4, 2020.

Code of Ethics

The Company had previously adopted a Code of Business Conduct and Ethics, which had covered all of our directors and employees, including our principal executive and financial officers. That Code of Business Conduct and Ethics has never been adopted by the current Board of Directors that was appointed after the change in management that occurred in March 2013 described above. When practicable, the Board of Directors intends to adopt a Code of Business Conduct and Ethics with elements listed under Item 406(b) of Regulation S-K, and that document will be posted on our website at www.respirerx.com and in a report filed with the SEC on a Current Report on Form 8-K.

Item 11. Executive Compensation

Summary Compensation Table for 2020

The table below summarizes the total compensation paid or earned by each of the named executive officers for the fiscal years ended December 31, 2020 and 2019. The information contained under the heading "Stock Awards" for all named executive officers includes the estimated value of equity awards using the Black-Scholes option-pricing model and does not reflect actual cash payments or actual dollars awarded.

Name and Principal Position	Year	Salary ($)(1)	Bonus ($)	Stock Awards ($)(1)	All Other Compensation ($)(2)	Total ($)
Arnold S. Lippa, Ph.D. Executive Chairman	2020	339,600	-	-	-	339,600
and Chief Scientific Officer	2019	339,600	-	-	-	339,600
Timothy L. Jones, Chief Executive	2020	304,225	200,000	91,000	10,484	605,709
Officer and President	2019	-	-	-	8,000	-
Jeff E. Margolis Senior Vice President,	2020	321,600	-	-	-	321,600
Chief Financial Officer, Treasurer and Secretary	2019	321,600	-	-	-	321,600

(1) The 2020 and 2019 salary amounts in the table above reflect contractual salary amounts plus employee benefits. There were no bonuses, stock or stock option awards or other compensation during the years ended December 31, 2020 and 2019.

(2) In accordance with Securities and Exchange Commission rules, "Other Annual Compensation" in the form of perquisites and other personal benefits has been omitted where the aggregate amount of such perquisites and other personal benefits was less than $10,000. The amount reflected for Mr. Jones is the amount of Board of Directors fees for the period of time prior to Mr. Jones becoming an executive officer at which time he was no longer eligible to received fees for serving on the Company's Board of Directors.

Narrative to Summary Compensation Table

In 2020, the Company accrued a cash bonus of $200,000 for Mr. Jones in accordance with the terms of his employment contract. In 2020, options were awarded to Mr. Jones. In 2019, no cash bonuses (performance or otherwise), stock awards or option awards were awarded. See Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations-Principal Commitments-*Employment Agreements* for more information about the compensation terms under the employment agreements of Mr. Jones, Dr. Lippa and Mr. Margolis.

Taking into account the Company's current operating structure and business plans, management is currently reevaluating the compensation policies of the Company and, as a result of that reassessment and in light of the Company's current financial circumstances, has made departures from the Company's historic compensation policies and will likely make substantial adjustments to such policies, including the termination of such policies, in the future.

Outstanding Equity Awards at Fiscal Year End

The following table shows information concerning outstanding equity awards at December 31, 2020, made by The Company to its named executive officers.

	Option Awards				
Name	**Number of Securities Underlying Unexercised Options Exercisable (#)**	**Number of Securities Underlying Unexercised Options Unexercisable (#)**	**Equity Incentive Plan Awards: Number of Securities Underlying Unexercised Unearned Options (#)**	**Option Exercise Price ($)**	**Option Expiration Date**
Timothy L. Jones	1,700,000	400,000	0	0.072	7/31/25
Arnold S. Lippa	4,615	0	0	81.250	6/30/22
	3,076	0	0	63.960	8/18/22
	7,384	0	0	73.775	3/31/21
	5,000	0	0	39.000	1/17/22
	5,000	0	0	20.000	6/30/22
	55,959	0	0	14.500	12/9/27
Jeff E. Margolis	4,615	0	0	81.250	6/30/22
	3,076	0	0	63.960	8/18/22
	7,384	0	0	73.775	3/31/21
	5,000	0	0	39.000	1/17/22
	5,000	0	0	20.000	6/30/22
	2,500	0	0	20.000	7/26/22
	38,868	0	0	14.500	12/9/27

At December 31, 2020, there were 1,847,477 options outstanding to named executive officers 1,447,477 of which had vested and 400,000 of which are unvested.

OPTION EXERCISES AND STOCK VESTED FOR 2020

None of the Company's named executive officers exercised any options to purchase shares of the Company's common stock during the year ended December 31, 2020. There were unvested option awards as of December 31, 2020 exercisable into 675,000 shares of Common Stock and none for 2019. At December 31, 2020, there were 3,248,168 options outstanding to named executive officers 2,573,168 of which had vested and 675,000 of which are unvested, the vested options having exercise prices ranging from $0.054 to $81.250 per share.

Employment Agreements – Termination or Change in Control

Three of the Company's named executive officers, Timothy L. Jones, Arnold S. Lippa, Ph.D. and Jeff E. Margolis (each an "Executive"), entered into employment agreements with the Company on May 06, 2020 and August 18, 2015 Upon entering into such agreements, the Company disclosed these agreements and filed them as exhibits on a Current Report on Form 8-K filed May 6, 2020 and August 19, 2015. The employment agreements that would have terminated on September 30, 2018 for Dr. Lippa and Mr. Margolis, were automatically extended for periods of one year pursuant to the terms of such agreements on September 30, 2019 and 2020. Following is a summary of the arrangements that provide for payment to a named executive officer at, following or in connection with any termination, including resignation, retirement or other termination, or in connection with a change of control or a change in the named executive officer's responsibilities following a change in control.

Each of the Executive employment agreements provide that if the Executive is terminated by the Company for cause, or by the Executive without good reason, or as a result of death or disability, Executive (or his estate) would be entitled to receive (i) any base salary earned but not paid through the date of such termination, paid on the next regularly scheduled payroll date following such termination and (ii) all other benefits, if any, due Executive, as determined in accordance with the plans, policies and practices of the Company. There are currently no plans policies or practices of the Company under clause (ii) of the prior sentence that would provide any additional benefits.

Each of the Executive employment agreements provide that if the Executive is terminated by the Company without cause, or by the Executive for good reason, the Executive Officer would be entitled to (i) a lump sum payment equal to twelve months of the Executive's then current base salary and (ii) full acceleration of the vesting of any then unvested stock options or other equity compensation awards held by the Executive (with any unvested performance-based awards accelerated at 100% of target performance levels).

If the Executive were to breach any of section of the employment agreement related to confidentiality, inventions or restrictive covenants, or the Company determines that Executive engaged in an act or omission that, if discovered during Executive's employment, would have entitled the Company to terminate Executive's employment hereunder for Cause, the Executive would forfeit the right to any unpaid severance and any unexercised options.

As used in the employment agreements, "cause" means (i) any act of personal dishonesty taken by the Executive in connection with his employment hereunder, (ii) the Executive's conviction or plea of *nolo contendere* to a felony, (iii) any act by the Executive that constitutes material misconduct and is injurious to the Company, (iv) continued violations by the Executive of the Executive's obligations to the Company, (v) material breach of the employment agreement, (vi) commission of any act of serious moral turpitude, or (vii) material failure to comply with the lawful direction of the Board. As used in the employment agreements, "for good reason" means without Executive's express written consent (i) a material diminution of Executive's duties, position or responsibilities relative to Executive's duties, position or responsibilities in effect immediately prior to such reduction; (ii) a material diminution by the Company of Executive's base salary as in effect immediately prior to such reduction, other than a general reduction in base salary that affects all of the Company's executive officers; (iii) any material breach by the Company of the employment agreement; or (iv) the relocation of Executive to a facility or a location more than fifty (50) miles from the current location of the Executive's principal office, which the Company and Executive agree would constitute a material change in the geographic location at which Executive must perform services to the Company.

In the event of a change in control of the company prior to the vesting of any of the options granted to the Executive in connection with entering into the employment agreement, all such unvested options would vest and become exercisable and would be exercised by cashless or net exercise, subject to any limitations set forth in the applicable option plans, option agreements and applicable law. As used in the employment agreements, "Change in Control" means the occurrence of any of the following events: (i) any "person" (as such term is used in Sections 13(d) and 14(d) of the Exchange Act) becomes the "beneficial owner" (as defined in Rule 13d-3 of the Exchange Act), directly or indirectly, of securities of the Company representing more than fifty percent (50%) of the total voting power represented by the Company's then outstanding voting securities; (ii) the consummation of the sale or disposition by the Company of all or substantially all of the Company's assets; or (iii) the consummation of a merger or consolidation of the Company with any other corporation, other than a merger consolidation which would result in the voting securities of the Company outstanding immediately prior thereto continuing to represent (either by remaining outstanding or by being converted into voting securities of the surviving entity or its parent) more than fifty percent (50%) of the total voting power represented by the voting securities of the Company or such surviving entity or its parent outstanding immediately after such merger or consolidation; provided, however, that notwithstanding the foregoing, the following shall not constitute a Change in Control: (A) any acquisition directly from the Company, (B) any acquisition by the Company, (C) any acquisition by any employee benefit plan (or related trust) sponsored or maintained by the Company or one of its affiliates, (D) any joint venture, (E) any royalty agreement, or (F) any license agreement.

The Company entered into an agreement with DNA Healthlink, Inc. effective on October 15, 2014 pursuant to which, Richard Purcell, the fourth named executive officer, was to serve as the Company's Senior Vice President of Research and Development on a month-to-month basis at the rate of $12,500 per month. Mr. Purcell did not provide such services during the fourth quarter of 2020 and is expected to resume providing such services in 2021.

The Company entered into an agreement with David Dickason effective September 15, 2020 pursuant to which, Mr. Dickason, the fifth named executive officer, was to serve as the Company's Senior Vice President of Preclinical Product Development, at will, at an hourly rate of $250 per hour. In addition, the agreement called for a restricted common stock grant of 200,000 shares of Common Stock, with a vesting schedule of 25% on December 15, 2020 and 25% on each of March 15, June 15 and September 15, 2021. 200,000 stock options were granted in lieu of restricted common stock.

Director Compensation

When the Compensation Committee was standing, it had used a combination of cash and stock-based incentive compensation to attract and retain qualified candidates to serve on the Board of Directors. In setting director compensation, the Compensation Committee considered the significant amount of time that directors expend in fulfilling their duties to the Company, as well as the skill-level required by the Company of members of the Board of Directors. The Board of Directors, sitting as a compensation committee has continued these policies in carrying out the duties of the previous Compensation Committee.

There were no option grants to either James Sapirstein (resigned as a member of the Board of Directors in December 2019) or Kathryn MacFarlane during 2019 and 2018. During 2019, Ms. MacFarlane earned $60,000 in cash compensation and Mr. Sapirstein earned $58,207 in 2019 through the date of his resignation from the Board of Directors of the Company. Such amounts have not yet been paid.

Director Summary Compensation Table

The following table shows the compensation received by the non-employee members of our board of directors for the year ended December 31, 2020. Directors who are also employees/officers of the Company did not receive any additional compensation for services as a director.

Name	Fees Earned or Paid in Cash ($)(2)	Stock Awards ($)	Option Awards ($)(1)	Total ($)
Kathryn MacFarlane	60,000		77,500	137,500

(1) Options exercisable into 1,250,000 shares were granted in 2020, all vesting upon grant. Options exercisable into 750,000 shares of Common Stock expire on July 31, 2025 and are exercisable at $.072 per share and options exercisable into 500,000 shares of Common Stock expire on September 30, 2025 and are exercisable $0.054 per share. No options were granted in 2019.
(2) $15,000 per quarter was earned by our non-employee member of the board of directors.

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

Beneficial Ownership of Common Stock

The following table sets forth certain information regarding the beneficial ownership of the Company's common stock as of April 13, 2021, by (i) each person known by the Company to be the beneficial owner of more than 5% of the outstanding common stock, (ii) each of the Company's directors, (iii) each of the Company's named executive officers, and (iv) all of the Company's executive officers and directors as a group. Except as indicated in the footnotes to this table, the Company believes that the persons named in this table have sole voting and investment power with respect to the shares of common stock indicated. In computing the number and percentage ownership of shares beneficially owned by a person, shares of common stock that a person has a right to acquire within sixty (60) days of April 13, 2021 pursuant to options, warrants or other rights are considered as outstanding, while these shares are not considered as outstanding for computing the percentage ownership of any other person or group.

	Shares Beneficially Owned	
Directors, Officers and 5% Stockholders[a]	**Amount and Nature of Beneficial Ownership**	**Percent of Class**
Arnold Lippa Family Trust of 2007	22,522,195(b)	22.40%
Jeff Margolis Trusts	20,903,459(c)	20.95%
Directors and Officers:		
Jeff E. Margolis	20,902,659(c)	20.95%
Arnold S. Lippa, Ph.D.	140(d)	0.00%
Timothy Jones	2,581,812(e)	2.82%
Kathryn MacFarlane	1,264,040(f)	1.39%
Richard Purcell	526,306(g)	0.58%
David Dickason	200,000(h)	0.22%
All directors and current executive officers as a group (6 persons)	25,475,757	24,52%

(a) Except as otherwise indicated, each individual or entity has, or is entitled to have within 60 days of April 13, 2021, sole voting or dispositive power with respect to the shares reported as beneficially owned.

(b) Dr. Lippa is neither the trustee nor the beneficiary of the Arnold Lippa Family Trust of 2007 (the "Lippa Trust"). Linda Lippa, Dr. Lippa's wife is a beneficiary of the Lippa Trust. These holdings include 11,461,716 shares of Common Stock options to purchase 81,034 shares of Common Stock warrants to purchase 10,978,645 shares of Common Stock and 800 shares directly owned by Aurora Capital LLC which entity is indirectly owned in part by the Lippa Trust and through which the Lippa Trust has voting and dispositive power over the shares with Jeff E. Margolis. The address of the Lippa Trust is c/o RespireRx Pharmaceuticals Inc., 126 Valley Road, Suite C, Glen Rock, New Jersey 07452.

(c) Mr. Margolis' holdings directly held by six trusts, three of which Mr. Margolis is the trustee and the balance of which Mr. Margolis' spouse is the trustee (the "Margolis Trusts"). These holdings include 10,645,194 shares of Common Stock, options to purchase 66,443 shares of Common Stock, warrants to purchase 10,191,022 shares of Common Stock and 800 shares of Common Stock directly owned Aurora Capital LLC which entity is indirectly owned in part by Mr. Margolis and through which he shares voting and dispositive power over the shares with the LIppa Trust. The address of the Margolis Trusts is c/o RespireRx Pharmaceuticals Inc., 126 Valley Road, Suite C, Glen Rock, New Jersey 07452.

(d) Dr. Lippa's holdings include 59 shares of Common Stock and warrants to purchase 81 shares of Common Stock.

(e) Mr. Jones' holdings include 440,906 shares of Common Stock, warrants to purchase 440,906 shares of Common Stock and options exercisable into 1,700,000 shares of Common Stock.

(f) Dr. MacFarlane's holdings include: (i) 615 shares of Common Stock, and (ii) options to purchase 1,263,425 shares of Common Stock.

(g) Mr. Purcell's holdings include: (i) 615 shares of Common Stock, and (ii) options to purchase 525,691 shares of Common Stock.

(h) Mr. Dickason's holdings include options to purchase 200,000 shares of Common Stock.

The Company is not aware of any arrangements that may at a subsequent date result in a change of control of the Company.

EQUITY COMPENSATION PLAN INFORMATION

On March 18, 2014, RespireRx adopted its 2014 Equity, Equity-Linked and Equity Derivative Incentive Plan (the "2014 Plan"). The Plan permits the grant of options and restricted stock with respect to up to 325,025 shares of common stock, in addition to stock appreciation rights and phantom stock, to directors, officers, employees, consultants and other service providers of the Company.

On June 30, 2015, the Board of Directors adopted the 2015 Stock and Stock Option Plan (as amended, the "2015 Plan"). As of March 31, 2020, there were 8,985,260 shares that may be issued under the 2015 Plan. On May 5, 2020 the Board of Directors increased the number of shares that may be issued under the 2015 Plan to 58,985,260. On July 31, 2020 the Board of Directors increased the number of shares that may be issued under the 2015 Plan to 158,985,260. The Company has not and does not intend to present the 2015 Plan to stockholders for approval.

Other than the change in the number of shares available under the 2015 Plan, no other changes were made to the 2015 Plan by these amendments noted above.

There were no stock grants and there were stock option grants for 6,750,000 shares of RespireRx's Common Stock during the twelve months ended December 31, 2020 and there were no stock grants or stock option grants in the twelve months ended December 31, 2019.

Information with respect to the Black-Scholes variables used in connection with the evaluation of the fair value of stock-based compensation costs and fees is provided at Note 3 Summary of Significant Accounting Policies.

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (a)	Weighted average exercise price of outstanding options, warrants and rights (b)	Number of securities remaining available for issuance under equity compensation plans (excluding securities reflected in column (a)) (c)
Equity compensation plans approved by security holders	1,564	$ 64.025	6,325
Equity compensation plans not approved by security holders (including non-plan options)	7,163,651	$ 1.948	8,704,251
Total	7,165,215	$ 1.961	8,710,576

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

Director Independence

As of December 31, 2020, Kathryn MacFarlane, PharmD. was an "independent director", as that term is defined under Section 803 of the NYSE Amex Company Guide. As noted above, as of December 31, 2020, all of the functions of the Audit, Compensation and Governance and Nominations Committees were being performed by the full board of directors. Dr. Lippa, Mr. Jones and Mr. Margolis are not "independent directors" as defined above.

Transactions with Related Persons

Dr. Arnold S. Lippa and Jeff E. Margolis, officers and directors of RespireRx since March 22, 2013, have indirect ownership and managing membership interests in Aurora Capital LLC ("Aurora") through interests held in its members, and Jeff. E. Margolis is also an officer of Aurora. Aurora is a boutique investment banking firm specializing in the life sciences sector.

During the fiscal year ended December 31, 2020, Arnold S. Lippa, the Company's Chief Scientific Officer and Executive Chairman extended credit to the Company in the aggregate amount of $81,037, of which $16,037 has been repaid. The aggregate of the net advances of $65,000 during fiscal year ended December 31, 2020 and the $25,000 advanced by Dr. Lippa in 2019, results in an outstanding balance due to Dr. Lippa of $90,000 as of December 31, 2020 and as of April 14, 2021, which amount has been accounted for by the Company as an advance by Dr. Lippa payable on demand. The proceeds of these advances were to make payments to the Company's auditors, patent counsel and payments due with respect to an insurance premium that had been financed. See also Note 4. Notes Payable.

On March 21, 2020, July 13, 2020 and September 30, 2020, Dr. Lippa and Jeff E. Margolis, forgave an aggregate of $1,656,000 of accrued compensation and benefits and received Series H Preferred Stock. On September 30, 2020, Timothy Jones forgave $28,218 or accrued compensation and benefits and received Series H Preferred Stock. See Note 8. Commitments and Contingencies – Significant Agreements and Contracts-Employment Agreements for a more detailed description of these transactions.

Item 14. Principal Accountant Fees and Services

Haskell & White LLP, acted as our independent registered public accounting firm for the fiscal years ended December 31, 2020 and 2019 and for the interim periods in such fiscal years. The following table shows the approximate fees that were incurred by us for audit and other services provided by Haskell & White LLP in fiscal 2020 and 2019.

	2020	2019
Audit Fees[1]	$ 95,352	$ 98,700
Audit-Related Fees[2]	-	-
Tax Fees[3]	-	-
All Other Fees[4]	16,500	-
Total	$ 111,852	$ 98,700

(1) Audit fees represent fees for professional services provided in connection with the audit of our annual financial statements and the review of our financial statements included in our Quarterly Reports on Form 10-Q and services that are normally provided in connection with statutory or regulatory filings.

(2) Audit-related fees, if any, represent fees for assurance and related services that are reasonably related to the performance of the audit or review of our financial statements and not reported above under "Audit Fees."

(3) Tax fees, if any, represent fees for professional services related to tax compliance, tax advice and tax planning.

(4) All other fees, if any, represent fees for products and services rendered by our independent registered accounting firm other than those listed above, including fees for consents and work related to our registration statement filing on Form S-1.

All audit related services and other services rendered by Haskell & White LLP were pre-approved by our Board of Directors. The Board of Directors has adopted a pre-approval policy that provides for the pre-approval of all services performed for us by our independent registered public accounting firm. Tax services are not provided by Haskell & White LLP.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) List of documents filed as part of this report:

(1) Financial Statements

Reference is made to the Index to Financial Statements on page F-1, where these documents are listed.

(2) Financial Statement Schedules

The financial statement schedules have been omitted because the required information is not applicable, or not present in amounts sufficient to require submission of the schedules, or because the information is included in the financial statements or notes thereto.

(3) Exhibits

A list of exhibits required to be filed as a part of this Annual Report on Form 10-K is set forth in the Exhibit Index, which is presented elsewhere in this document and incorporated herein by reference.

Item 16. Form 10-K Summary

Not applicable

RESPIRERX PHARMACEUTICALS INC.
AND SUBSIDIARY

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS
(INCLUDING REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM)

Years Ended December 31, 2020 and 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and Board of Directors
RespireRx Pharmaceuticals Inc. and Subsidiary

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of RespireRx Pharmaceuticals Inc. and Subsidiary (the "Company") as of December 31, 2020 and 2019, the related consolidated statements of operations, stockholders' deficiency, and cash flows for each of the years then ended, and the related notes (collectively, the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Company as of December 31, 2020 and 2019, and the consolidated results of its operations and its cash flows for each of the years then ended, in conformity with generally accepted accounting principles generally accepted in the United States of America.

Going Concern

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 2 to the consolidated financial statements, the Company has experienced recurring losses, negative cash flows from operations, has limited capital resources, and a net stockholders' deficiency. These matters raise substantial doubt about the Company's ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 2. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the 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 consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

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

Critical Audit Matters

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

Share Based Compensation

Critical Audit Matter Description

The Company issues stock options to employees and vendors. Management uses the Black-Scholes option-pricing model to estimate the fair value of its stock options. The Black-Scholes option-pricing model involves the use of significant estimates, including the following:

- Risk-free interest rate;
- Expected share price volatility;
- Expected dividend yield; and
- Expected life of the award.

Given the significant estimates involved in determining the fair value of stock options, the related audit effort in evaluating management's estimates for the inputs to the Black-Scholes pricing model was extensive and required a high degree of auditor judgment.

How the Critical Audit Matter was Addressed in the Audit

We obtained an understanding of the management's process to estimate the fair value of stock options, including how management develops each of the estimates required as inputs to the Black-Scholes option-pricing model. We applied the following audit procedures related to testing management's estimates utilized in the Black-Scholes option-pricing model:

- We compared the Company's risk-free interest rate used to the comparable United States Treasury yield for a term comparable to option's estimated life.
- We recalculated the Company's historical share price volatility for a term of 12 months prior to the grant date because management considered the volatility for this period to be a better reflection of future value than the historical share price volatility of the term of the options.
- We performed a look-back of the Company's previously issued dividends, noting there were none. We inquired with management of the Company who informed us that no future dividends were currently anticipated.
- We agreed the inputs used for the life of the award to management's estimate of the expected life, which is the contractual life as no options have been exercised recently.

Accounting for Complex Debt Transactions

Critical Audit Matter Description

During the year ended December 31, 2020, the Company entered into several convertible notes payable that included original issue discounts, beneficial conversion features, and warrants. The proceeds of the convertible notes payable are allocated to the components of the convertible debt instrument in accordance with *ASC 470-20, Debt with Conversion and Other Options*. Management used the Black-Scholes option-pricing model to estimate the fair value of the warrants issued with the convertible notes, and allocated the proceeds to the warrants and the debt host based on a relative fair value basis. The Black-Scholes option-pricing model involves the use of significant estimates, including the following:

- Risk-free interest rate;
- Expected share price volatility;
- Expected dividend yield; and
- Contractual life of the award.

Given the significant estimates involved in determining the individual components of the debt instrument and the related debt discounts resulting from the relative fair value calculation for the warrants and intrinsic value of the beneficial conversion features, the related audit effort in evaluating management's estimates in determining those items was extensive and required a high degree of auditor judgment.

How the Critical Audit Matter was Addressed in the Audit

We obtained an understanding over management's process to determine the individual components of the debt instrument and the methodology to calculate the relative fair value of the warrants and beneficial conversion features, in accordance with the applicable accounting standards. This also included assessing how management develops each of the estimates for the inputs to the Black-Scholes option-pricing model. We applied the following audit procedures related to testing the management's estimates utilized in the Black-Scholes option-pricing model for valuing the warrants:

- We compared the Company's risk-free interest rate used to the comparable United States Treasury yield for a term comparable to the warrants' remaining contractual term.
- We recalculated the Company's historical share price volatility for a term of 12 months prior to the grant date because management considered the volatility for this period to be a better reflection of future value than the historical share price volatility of the term of the options.
- We performed a look-back of the Company's previously issued dividends, noting there were none. We inquired with management of the Company who informed us that no future dividends were currently anticipated.
- We agreed the inputs used for the term of the warrants to the contractual term of the warrant.

We also reviewed management's relative fair value calculation used to determine the components of the debt instrument and the values assigned to each as follows:

- We obtained a copy of the convertible debt agreement to understand its terms, noting management properly identified the components of the debt instrument.
- We agreed the proceeds of the notes to confirmation letters with the note holder or to deposits in the banking records.
- We evaluated the accounting methodology to assign values to the individual debt components determining it was consistent with the applicable accounting standards.
- We agreed the fair value assigned to the warrants to the fair value calculated using the Black-Scholes option-pricing model.
- We recalculated the relative fair value assigned to the warrants and host debt instrument.
- We agreed the conversion price to the convertible note agreement and recalculated the intrinsic value of the beneficial conversion features, noting it was properly recorded as a debt discount.

HASKELL & WHITE LLP

We have served as the Company's auditor since 2004.

Irvine, California
April 15, 2021

RESPIRERX PHARMACEUTICALS INC.
AND SUBSIDIARY

CONSOLIDATED BALANCE SHEETS

	December 31, 2020	December 31, 2019
ASSETS		
Current assets:		
Cash and cash equivalents	$ 825	$ 16,690
Deferred financing costs	52,609	-
Prepaid expenses, including current portion of long-term prepaid insurance of $0 at December 31, 2020 and $10,586 at December 31, 2019	31,653	28,638
Total current assets	85,087	45,328
Total assets	$ 85,087	$ 45,328
LIABILITIES AND STOCKHOLDERS' DEFICIENCY		
Current liabilities:		
Accounts payable and accrued expenses, including $635,146 and $476,671 payable to related parties at December 31, 2020 and 2019, respectively	$ 4,923,947	$ 3,772,030
Accrued compensation and related expenses	1,540,809	2,083,841
Convertible notes payable, currently due and payable on demand, including accrued interest of $85,693 and $113,304 at December 31, 2020 and 2019, respectively, (of which $48,700, including accrued interest of $23,700, was deemed to be in default at December 31, 2020) (Note 4)	414,860	551,591
Note payable to SY Corporation, including accrued interest of $411,385 and $363,280 at December 31, 2020 and 2019, respectively (payment obligation currently in default – Note 4)	864,551	766,236
Notes and advances payable to officers, including accrued interest of $46,717 and $35,388 at December 31, 2020 and 2019, respectively (Note 4)	213,067	142,238
Notes payable to former officer, including accrued interest of $58,965 and $41,977 as of December 31, 2020 and December 31, 2019, respectively (Note 4)	186,565	169,577
Other short-term notes payable	4,608	4,634
Total current liabilities	8,148,407	7,490,147
Commitments and contingencies (Note 9)		
Stockholders' deficiency: (Note 6)		
Series B convertible preferred stock, $0.001 par value; $0.6667 per share liquidation preference; aggregate liquidation preference $25,001; shares authorized: 37,500; shares issued and outstanding: 37,500; common shares issuable upon conversion at 0.000030 common shares per Series B share: 1	21,703	21,703
Common stock, $0.001 par value; shares authorized: 2,000,000,000; shares issued and outstanding: 71,271,095 and 417,507 at December 31, 2020 and 2019, respectively (reflected on a post 10 for 1 reverse stock split basis which occurred on January 5, 2021)	71,271	418
Additional paid-in capital	162,654,002	159,042,145
Accumulated deficit	(170,810,296)	(166,509,085)
Total stockholders' deficiency	(8,063,320)	(7,444,819)
Total liabilities and stockholders' deficiency	$ 85,087	$ 45,328

See accompanying notes to consolidated financial statements and report of independent registered public accounting firm.

RESPIRERX PHARMACEUTICALS INC.
AND SUBSIDIARY

CONSOLIDATED STATEMENTS OF OPERATIONS

	Years Ended December 31,	
	2020	**2019**
Operating expenses:		
General and administrative, including $1,230,370 and $485,332 to related parties for the years ended December 31, 2020 and 2019, respectively	$ 2,676,860	$ 1,137,175
Research and development, including $490,850 and $490,908 to related parties for the years ended December 31, 2020 and 2019, respectively	638,275	599,329
Total operating costs and expenses	3,315,135	1,736,504
Loss from operations	(3,315,135)	(1,736,504)
Loss on extinguishment of debt and other liabilities in exchange for equity	(389,902)	-
Interest expense, including $11,329 and $60,135 to related parties for the years ended December 31, 2020 and 2019, respectively	(545,675)	(404,661)
Foreign currency transaction (loss) gain	(50,499)	26,132
Net loss	$ (4,301,211)	$ (2,115,033)
Deemed dividends from warrant anti-dilution provisions	$ (1,440,214)	$ -
Net loss attributable to common shareholders	$ (5,741,425)	$ (2,115,033)
Net loss per common share - basic and diluted respectively (reflected on a post 10 for 1 reverse stock split basis which occurred on January 5, 2021)	$ (0.22)	$ (5.41)
Weighted average common shares outstanding - basic and diluted respectively (reflected on a post 10 for 1 reverse stock split basis which occurred on January 5, 2021)	25,855,664	390,848

See accompanying notes to consolidated financial statements and report of independent registered public accounting firm.

RESPIRERX PHARMACEUTICALS INC.
AND SUBSIDIARY

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' DEFICIENCY

Years Ended December 31, 2020 and 2019

	Series B and Series H Convertible Preferred Stock		Common Stock		Additional		Total
	Shares	Amount	Shares	Par Value	Paid-in Capital	Accumulated Deficit	Stockholders' Deficiency
Balance at December 31, 2018	37,500	$ 21,703	387,207	$ 387	$158,638,707	$(164,394,052)	$ (5,733,255)
Warrants issued with respect to convertible notes issued from January through March 2019					45,812		45,812
Common stock issued related to convertible notes			1,750	2	3,331		3,333
Discounts associated with convertible note issuances from April through November 2019					329,019		329,019
Common stock issued as partial settlement of convertible notes issued from April through May 2019			28,550	29	25,276		25,305
Net Loss						$ (2,115,033)	$ (2,115,033)
Balance at December 31, 2019	37,500	$ 21,703	417,507	$ 418	$159,042,145	$(166,509,085)	$ (7,444,819)
Issuance of Common Stock for payment of accrued compensation			900,000	900	305,100		306,000
Issuances of Series H Preferred Stock payment of accrued compensation	1,383	$ 1			1,378,217		1,378,218
Issuance of Series H Preferred Stock for payment of accounts payable	241	$ 0			307,015		307,015
Conversion of Series H Preferred Stock to Common Stock	(1,624)	$ (1)			(1,685,232)		(1,685,233)
Issuance of Common Stock and Warrants for Conversion of Series H Preferred Stock			25,377,426	$25,377	1,659,856		1,685,233
Sale of Common Stock, net of costs			7,900,000	$ 7,900	78,237		86,137
Note payable issued with Common Stock					(40,000)		(40,000)
Note discounts					90,000		90,000
Note payable conversions			26,291,373	$26,291	1,100,347		1,126,638
Option grants					384,250		384,250
Cashless Warrant exercises			10,384,789	$10,385	(10,385)		-
Warrants issued with convertible debt					44,452		44.452
Net Loss						$ (4,301,211)	$ (4,301,211)
Balance at December 31, 2020	37,500	$ 21,703	71,271,095	$71,271	$162,654,002	$(170,810,296)	$ (8,063,320)

See accompanying notes to consolidated financial statements and report of independent registered public accounting firm.

RESPIRERX PHARMACEUTICALS INC.
AND SUBSIDIARY

CONSOLIDATED STATEMENTS OF CASH FLOWS

	Years Ended December 31,	
	2020	**2019**
Cash flows from operating activities:		
Net loss	$ (4,301,211)	$ (2,115,033)
Adjustments to reconcile net loss to net cash used in operating activities:		
Amortization of debt discounts related to convertible notes payable	374,080	215,575
Costs associated with convertible note conversion paid with common stock	49,219	750
Loss on extinguishment of debt	323,996	-
Loss on extinguishment of other liabilities	65,906	-
Stock-based compensation and fees included in -		
General and administrative expenses	345,500	-
Research and development expenses and vesting options	38,750	-
Foreign currency transaction loss (gain)	50,211	(26,132)
Changes in operating assets and liabilities:		
(Increase) decrease in -		
Prepaid expenses and advanced clinical research payments	(3,014)	13,355
Increase (decrease) in -		
Accounts payable and accrued expenses	1,260,922	524,324
Accrued compensation and related expenses	1,141,186	779,407
Accrued interest payable	141,454	120,009
Net cash used in operating activities	(513,001)	(487,745)
Cash flows from financing activities:		
Proceeds from sale of common stock	162,886	-
Proceeds from officer notes	59,500	22,751
Proceeds from issuance of notes payable	274,750	478,150
Net cash provided by financing activities	497,136	471,151
Cash and cash equivalents:		
Net decrease	(15,865)	(16,594)
Balance at beginning of period	16,690	33,284
Balance at end of period	$ 825	$ 16,690

(Continued)

RESPIRERX PHARMACEUTICALS INC.
AND SUBSIDIARY

CONSOLIDATED STATEMENTS OF CASH FLOWS
(Continued)

	Years Ended December 31,	
	2020	**2019**
Supplemental disclosures of cash flow information:		
Cash paid for -		
Interest	$ 6,466	$ 5,130
Non-cash financing activities:		
Issuance of common stock in exchange for extinguishment of Convertible Notes Payable	$ 694,946	$ -
Conversion fees paid with common stock upon principal payment on convertible notes payable	$ 30,632	$ 750
Accounts payable and accrued expenses extinguished with common stock options	$ 241,109	$ -
Issuance of common stock in payment of accrued compensation	$ 1,684,218	$ -
Issuance of commitment note for equity line	$ 40,000	$ -
Issuance of warrants with convertible notes	$ 44,451	$ -
Beneficial conversion feature associated with convertible notes	$ 90,000	$ -
Short-term note payable issued in connection with financing of directors and officers insurance policy	$ 70,762	$ 61,746
Short-term note payable issued in connection with financing of clinical trial and other office insurance policies	$ 9,215	$ 9,322
Interest liability paid with common stock	11,760	-

See accompanying notes to consolidated financial statements and report of independent registered public accounting firm.

RESPIRERX PHARMACEUTICALS INC.
AND SUBSIDIARY
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Years Ended December 31, 2020 and 2019

1. Organization and Basis of Presentation

Organization

RespireRx Pharmaceuticals Inc. ("RespireRx") was formed in 1987 under the name Cortex Pharmaceuticals, Inc. to engage in the discovery, development and commercialization of innovative pharmaceuticals for the treatment of neurological and psychiatric disorders. On December 16, 2015, RespireRx filed a Certificate of Amendment to its Second Restated Certificate of Incorporation (as amended, the "Certificate of Incorporation") with the Secretary of State of the State of Delaware to amend its Second Restated Certificate of Incorporation to change its name from Cortex Pharmaceuticals, Inc. to RespireRx Pharmaceuticals Inc. In August 2012, RespireRx acquired Pier Pharmaceuticals, Inc. ("Pier"), which is now a wholly owned subsidiary. Pier was a clinical stage biopharmaceutical company developing a pharmacologic treatment for obstructive sleep apnea ("OSA") and had been engaged in research and clinical development activities which activities are now in RespireRx.

Basis of Presentation

The consolidated financial statements are of RespireRx and its wholly-owned subsidiary, Pier.

2. Business

The mission of the Company is to develop innovative and revolutionary treatments to combat disorders caused by disruption of neuronal signaling. We are developing treatment options that address conditions that affect millions of people, but for which there are limited or poor treatment options, including OSA, attention deficit hyperactivity disorder ("ADHD") epilepsy, chronic pain, including inflammatory and neuropathic pain, recovery from spinal cord injury ("SCI"), as well as other areas of interest based on results of animal studies to date.

RespireRx is developing a pipeline of new drug products based on our broad patent portfolios across two distinct drug platforms:

(i) our pharmaceutical cannabinoids platform (which we refer to as ResolutionRx), including dronabinol (a synthetic form of Δ9-tetrahydrocannabinol ("Δ9-THC")), which acts upon the nervous system's endogenous cannabinoid receptors, and

(ii) our neuromodulators platform (which we refer to as EndeavourRx) is made up of two programs: (a) our ampakines program, including proprietary compounds that are positive allosteric modulators ("PAMs") of AMPA-type glutamate receptors to promote neuronal function and (b) our GABAkines program, including proprietary compounds that are PAMs of GABAA receptors, which was recently established pursuant to our entry with the University of Wisconsin-Milwaukee Research Foundation, Inc., an affiliate of the University of Wisconsin-Milwaukee ("UWMRF"), into a patent license agreement (the UWMRF Patent License Agreement").

Financing our Platforms

Our major challenge has been to raise substantial equity or equity-linked financing to support research and development plans for our cannabinoid and neuromodulator platforms, while minimizing the dilutive effect to pre-existing stockholders. At present, we believe that we are hindered primarily by our public corporate structure, our OTCQB listing, and low market capitalization as a result of our low stock price.

For this reason, the Company has effected an internal restructuring plan through which our two drug platforms have been reorganized into separate business units and may in the future, be organized into subsidiaries of RespireRx. We believe that by creating one or more subsidiaries to further the aims of ResolutionRx and EndeavourRx, it may be possible, through separate finance channels, to optimize the asset values of each. We are also planning to commence a securities offering by the Company pursuant to Regulation A by filing a Form 1-A.

Going Concern

The Company's consolidated financial statements have been presented on the basis that it is a going concern, which contemplates the realization of assets and satisfaction of liabilities in the normal course of business. The Company has incurred net losses of $4,301,211 and $2,115,033 for the fiscal years ended December 31, 2020 and 2019, respectively, and negative operating cash flows of $513,001 and $487,745 for the fiscal years ended December 31, 2020 and 2019, respectively. The Company also had a stockholders' deficiency of $8,063,320 at December 31, 2020 and expects to continue to incur net losses and negative operating cash flows for at least the next few years. As a result, management has concluded that there is substantial doubt about the Company's ability to continue as a going concern, and the Company's independent registered public accounting firm, in its report on the Company's consolidated financial statements for the year ended December 31, 2020, expressed substantial doubt about the Company's ability to continue as a going concern.

The Company is currently, and has for some time, been in significant financial distress. It has extremely limited cash resources and current assets and has no ongoing source of sustainable revenue. Management is continuing to address various aspects of the Company's operations and obligations, including, without limitation, debt obligations, financing requirements, intellectual property, licensing agreements, legal and patent matters and regulatory compliance, and has taken steps to continue to raise new debt and equity capital to fund the Company's business activities from both related and unrelated parties.

The Company is continuing its efforts to raise additional capital in order to be able to pay its liabilities and fund its business activities on a going forward basis, including the pursuit of the Company's planned research and development activities. The Company regularly evaluates various measures to satisfy the Company's liquidity needs, including development and other agreements with collaborative partners and, when necessary, seeking to exchange or restructure the Company's outstanding securities. The Company is evaluating certain changes to its operations and structure to facilitate raising capital from sources that may be interested in financing only discrete aspects of the Company's development programs. Such changes could include a significant reorganization, which may include the formation of one or more subsidiaries into which one or more programs may be contributed. As a result of the Company's current financial situation, the Company has limited access to external sources of debt and equity financing. Accordingly, there can be no assurances that the Company will be able to secure additional financing in the amounts necessary to fully fund its operating and debt service requirements. If the Company is unable to access sufficient cash resources, the Company may be forced to discontinue its operations entirely and liquidate.

3. Summary of Significant Accounting Policies

Principles of Consolidation

The accompanying consolidated financial statements are prepared in accordance with United States generally accepted accounting principles ("GAAP") and include the financial statements of RespireRx and its wholly-owned subsidiary, Pier. Intercompany balances and transactions have been eliminated in consolidation.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions. These estimates and assumptions affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Significant estimates include, among other things, accounting for potential liabilities, and the assumptions used in valuing stock-based compensation issued for services. Actual amounts may differ from those estimates.

Reverse Stock Split on January 5, 2021

On January 5, 2021, the Company effected a ten to one reverse-stock split of its common stock. Every ten shares of the "old" common stock was exchanged for one "new" share of common stock rounded down to the nearest whole share with any fractional shares of common stock paid to the stockholder in cash. Option and warrant issuances prior to January 5, 2021 have also been proportionately adjusted by dividing the number of shares into which such options and warrants may exercise by ten and multiplying the exercise price by ten. The effect of the reverse-stock split has been reflected retroactively in the Company's consolidated financial statements as of December 31, 2020 and 2019 and for the fiscal years ended December 31, 2020 and 2019.

Concentrations of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk consist primarily of cash and cash equivalents. The Company limits its exposure to credit risk by investing its cash with high quality financial institutions. The Company's cash balances may periodically exceed federally insured limits. The Company has not experienced a loss in such accounts to date.

Value of Financial Instruments

The authoritative guidance with respect to fair value of financial instruments established a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value into three levels and requires that assets and liabilities carried at fair value be classified and disclosed in one of three categories, as presented below. Disclosure as to transfers into and out of Levels 1 and 2, and activity in Level 3 fair value measurements, is also required.

Level 1. Observable inputs such as quoted prices in active markets for an identical asset or liability that the Company has the ability to access as of the measurement date. Financial assets and liabilities utilizing Level 1 inputs include active-exchange traded securities and exchange-based derivatives.

Level 2. Inputs, other than quoted prices included within Level 1, which are directly observable for the asset or liability or indirectly observable through corroboration with observable market data. Financial assets and liabilities utilizing Level 2 inputs include fixed income securities, non-exchange-based derivatives, mutual funds, and fair-value hedges.

Level 3. Unobservable inputs in which there is little or no market data for the asset or liability which requires the reporting entity to develop its own assumptions. Financial assets and liabilities utilizing Level 3 inputs include infrequently-traded, non-exchange-based derivatives and commingled investment funds, and are measured using present value pricing models.

The Company determines the level in the fair value hierarchy within which each fair value measurement falls in its entirety, based on the lowest level input that is significant to the fair value measurement in its entirety. In determining the appropriate levels, the Company performs an analysis of the assets and liabilities at each reporting period end.

The carrying amounts of financial instruments (consisting of cash and accounts payable and accrued expenses) are considered by the Company to be representative of the respective fair values of these instruments due to the short-term nature of those instruments. With respect to the note payable to SY Corporation and the convertible notes payable, management does not believe that the credit markets have materially changed for these types of borrowings since the original borrowing date. The Company considers the carrying amounts of the notes payable to officers, inclusive of accrued interest, to be representative of the respective fair values of such instruments due to the short-term nature of those instruments and their terms.

Deferred Financing Costs

Costs incurred in connection with ongoing debt and equity financings, including legal fees, are deferred until the related financing is either completed or abandoned.

Costs related to abandoned debt or equity financings are charged to operations in the period of abandonment. Costs related to completed equity financings are netted against the proceeds.

Capitalized Financing Costs

The Company presents debt issuance costs related to debt liability in its consolidated balance sheet as a direct deduction from the carrying amount of that debt liability, consistent with the presentation for debt discounts.

Convertible Notes Payable

Convertible notes are evaluated to determine if they should be recorded at amortized cost. To the extent that there are associated warrants, commitment shares or a beneficial conversion feature, the convertible notes and warrants are evaluated to determine if there are embedded derivatives to be identified, bifurcated and valued at fair value in connection with and at the time of such financing.

Notes Exchanges

In cases where debt or other liabilities are exchanged for equity, the Company compares the carrying value of debt, inclusive of accrued interest, if applicable, being exchanged, to the value of the equity issued and records any loss or gain as a result of such exchange. See Note 4. Notes Payable.

Extinguishment of Debt and Settlement of Liabilities

The Company accounts for the extinguishment of debt and settlement of liabilities by comparing the carrying value of the debt or liability to the value of consideration paid or assets given up and recognizing a loss or gain in the consolidated statement of operations in the amount of the difference in the period in which such transaction occurs.

Prepaid Insurance

Prepaid insurance represents the premium paid in March 2020 for directors' and officers' insurance as well as the amount paid in April 2020 for office-related insurances and clinical trial coverage. Directors' and Officers' insurance tail coverage, purchased in March 2013 expired in March 2020 and all prepaid amounts have been fully amortized. The amounts of prepaid insurance amortizable in the ensuing twelve-month period are recorded as prepaid insurance in the Company's consolidated balance sheet at each reporting date and amortized to the Company's consolidated statement of operations for each reporting period.

Stock-Based Awards

The Company periodically issues common stock and stock options to officers, directors, Scientific Advisory Board members, consultants and other vendors for services rendered. Such issuances vest and expire according to terms established at the issuance date of each grant.

The Company accounts for stock-based payments to officers and directors, outside consultants and vendors measuring the cost of services received in exchange for equity awards based on the grant date fair value of the awards, with the cost recognized as compensation expense on the straight-line basis in the Company's consolidated financial statements over the vesting period of the awards.

Stock grants, which are sometimes subject to time-based vesting, are measured at the grant date fair value of the common stock and charged to operations ratably over the vesting period.

Stock options granted to members of the Company's outside consultants and other vendors are valued on the grant date. As the stock options vest, the Company recognizes this expense over the period in which the services are provided.

The value of stock options granted as stock-based compensation is determined utilizing the Black-Scholes option-pricing model, and is affected by several variables, the most significant of which are the life of the equity award, the exercise price of the stock option as compared to the fair value of the common stock on the grant date, and the estimated volatility of the common stock over the estimated life of the equity award. Estimated volatility is based on the historical volatility of the Company's common stock. The risk-free interest rate is based on the U.S. Treasury yield curve in effect at the time of grant. The fair value of common stock is determined by reference to the quoted market price of the Company's common stock.

Stock options and warrants issued to non-employees as compensation for services to be provided to the Company or in settlement of debt are accounted for based upon the fair value of the services provided or the estimated fair value of the stock option or warrant, whichever can be more clearly determined. Management uses the Black-Scholes option-pricing model to determine the fair value of the stock options and warrants issued by the Company. The Company recognizes this expense over the period in which the services are provided.

As of December 31, 2020, there were stock option grants exercisable into 6,750,000 shares of common stock granted to one officer who is also a director, one director who is not an officer, consultants and other vendors. Certain stock options granted were subject to vesting schedules. Stock options exercisable into 5,825,000 shares of common stock vested during the fiscal year ended December 31, 2020. The Black Scholes value of vested stock options granted during the fiscal year ended December 31, 2020 was $384,250. During the fiscal year ended December 31, 2019, there were no stock options granted to officers, directors, Scientific Advisory Board members, consultants or other vendors.

For stock options requiring an assessment of fair value during the fiscal years ended December 31, 2020 and 2019 the fair value of each stock option award was estimated using the Black-Scholes option-pricing model using the following assumptions:

	2020	2019
Risk-free interest rate	0.21-0.28%	-%
Expected dividend yield	0%	-%
Expected volatility	412.81-426.92%	-%
Expected life at date of issuance	5	-

The expected life is estimated to be equal to the term of the common stock options issued in 2020.

The Company recognizes the fair value of stock-based awards in general and administrative costs and in research and development costs, as appropriate, in the Company's consolidated statements of operations. The Company issues new shares of common stock to satisfy stock option and warrant exercises. There were no stock options exercised during the fiscal years ended December 31, 2020 and 2019.

There were no warrants issued as compensation or for services during the fiscal years ended December 31, 2020 and 2019 requiring such assessment. Warrants, if issued for services, are typically issued to placement agents or brokers for fund raising services and are not issued from any of the Company's stock and option plans, from which options issued to non-employees for services are typically issued.

Income Taxes

The Company accounts for income taxes under an asset and liability approach for financial accounting and reporting for income taxes. Accordingly, the Company recognizes deferred tax assets and liabilities for the expected impact of differences between the financial statements and the tax basis of assets and liabilities.

The Company records a valuation allowance to reduce its deferred tax assets to the amount that is more likely than not to be realized. In the event the Company was to determine that it would be able to realize its deferred tax assets in the future in excess of its recorded amount, an adjustment to the deferred tax assets would be credited to operations in the period such determination was made. Likewise, should the Company determine that it would not be able to realize all or part of its deferred tax assets in the future, an adjustment to the deferred tax assets would be charged to operations in the period such determination was made.

Pursuant to Internal Revenue Code Sections 382 and 383, use of the Company's net operating loss and credit carryforwards may be limited if a cumulative change in ownership of more than 50% occurs within any three-year period since the last ownership change. The Company may have had a change in control under these Sections. However, the Company does not anticipate performing a complete analysis of the limitation on the annual use of the net operating loss and tax credit carryforwards until the time that it anticipates it will be able to utilize these tax attributes.

As of December 31, 2020, the Company did not have any unrecognized tax benefits related to various federal and state income tax matters and does not anticipate any material amount of unrecognized tax benefits within the next 12 months.

The Company is subject to U.S. federal income taxes and income taxes of various state tax jurisdictions. As the Company's net operating losses have yet to be utilized, all previous tax years remain open to examination by Federal authorities and other jurisdictions in which the Company currently operates or has operated in the past.

The Company accounts for uncertainties in income tax law under a comprehensive model for the financial statement recognition, measurement, presentation and disclosure of uncertain tax positions taken or expected to be taken in income tax returns as prescribed by GAAP. The tax effects of a position are recognized only if it is "more-likely-than-not" to be sustained by the taxing authority as of the reporting date. If the tax position is not considered "more-likely-than-not" to be sustained, then no benefits of the position are recognized. As of December 31, 2020, the Company had not recorded any liability for uncertain tax positions. In subsequent periods, any interest and penalties related to uncertain tax positions will be recognized as a component of income tax expense.

Foreign Currency Transactions

The note payable to SY Corporation, which is denominated in a foreign currency (the South Korean Won), is translated into the Company's functional currency (the United States Dollar) at the exchange rate on the balance sheet date. The foreign currency exchange gain or loss resulting from translation is recognized in the related consolidated statements of operations.

Research and Development

Research and development costs include compensation paid to management directing the Company's research and development activities, including but not limited to compensation paid to our Chief Scientific Officer and fees paid to consultants and outside service providers and organizations (including research institutes at universities), and other expenses relating to the acquisition, design, development and clinical testing of the Company's treatments and product candidates.

License Agreements

Obligations incurred with respect to mandatory payments provided for in license agreements are recognized ratably over the appropriate period, as specified in the underlying license agreement, and are recorded as liabilities in the Company's consolidated balance sheet, with a corresponding charge to research and development costs in the Company's consolidated statement of operations. Obligations incurred with respect to milestone payments provided for in license agreements are recognized when it is probable that such milestone will be reached and are recorded as liabilities in the Company's consolidated balance sheet, with a corresponding charge to research and development costs in the Company's consolidated statement of operations.

Patent Costs

Due to the significant uncertainty associated with the successful development of one or more commercially viable products based on the Company's research efforts and any related patent applications, all patent costs, including patent-related legal and filing fees, are expensed as incurred and are charged to general and administrative expenses.

Earnings per Share

The Company's computation of earnings per share ("EPS") includes basic and diluted EPS. Basic EPS is measured as the income (loss) attributable to common stockholders divided by the weighted average common shares outstanding for the period. Diluted EPS is similar to basic EPS but presents the dilutive effect on a per share basis of potential common shares (e.g., warrants and options) as if they had been converted at the beginning of the periods presented, or issuance date, if later. Potential common shares that have an anti-dilutive effect (i.e., those that increase income per share or decrease loss per share) are excluded from the calculation of diluted EPS.

Net income (loss) attributable to common stockholders consists of net income or loss, as adjusted for actual and deemed preferred stock dividends declared, amortized or accumulated. The Company recorded a deemed dividend for the issuance of warrants during year ended December 31, 2020 of $1,440,214. The deemed dividend is added to the net loss in determining the net loss available to common stockholders.

Loss per common share is computed by dividing net loss by the weighted average number of shares of common stock outstanding during the respective periods. Basic and diluted loss per common share is the same for all periods presented because all warrants and stock options outstanding are anti-dilutive.

At December 31, 2020 and 2019, the Company excluded the outstanding securities summarized below, which entitle the holders thereof to acquire shares of common stock, from its calculation of earnings per share, as their effect would have been anti-dilutive.

	December 31,	
	2020	2019
Series B convertible preferred stock	1	11
Convertible notes payable	13,333,036	7,017,896
Common stock warrants	28,809,352	2,191,043
Common stock options	7,165,215	4,344,994
Total	49,307,604	13,553,944

Reclassifications

Certain comparative figures in 2019 have been reclassified to conform to the current year's presentation. These reclassifications were immaterial, both individually and in the aggregate.

Recent Accounting Pronouncements

In August 2020, the FASB issued Accounting Standards Update No. 2020-06, Debt – Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging—Contracts in Entity's Own Equity (Subtopic 815-40). The subtitle is Accounting for Convertible Instruments and Contracts in an Entity's Own Equity. This Accounting Standard Update ("ASU") addresses complex financial instruments that have characteristics of both debt and equity. The application of this ASU would reduce the number of accounting models for convertible debt instruments and convertible preferred stock. Limiting the accounting models would result in fewer embedded conversion features being separately recognized from the host contract as compared with current GAAP. Convertible instruments that continue to be subject to separation models are (1) those with embedded conversion features that are not clearly and closely related to the host contract, that meet the definition of a derivative, and that do not qualify for a scope exception from derivative accounting and (2) convertible debt instruments issued with substantial premiums for which the premiums are recorded as paid-in capital. The Company has historically issued complex financial instruments and has considered whether embedded conversion features have existed within those contracts or whether derivatives would appropriately be bifurcated. To date, no such bifurcation has been necessary. However, it is possible that this ASU may have a substantial impact on the Company's financial statements. Management is evaluating the potential impact. This ASU becomes effective for fiscal years beginning after December 15, 2023.

In January 2020, the FASB issued ASU 2020-01, Clarifying the Interactions between Topic 321, Topic 323, Equity Method and Joint Ventures, and Topic 815, Derivatives and Hedging which represents an amendment clarifying the interaction between accounting standards related to equity securities, equity method investments and certain derivatives. The guidance is effective for fiscal years beginning after December 15, 2020. Management is currently evaluating the impact the guidance will have on our consolidated financial statements.

In August 2018, the FASB issued ASU 2018-13, Disclosure Framework-Changes to the Disclosure Requirements for Fair Value Measurement, an accounting standard update which modifies the disclosure requirements on fair value measurements. This guidance was effective for fiscal years beginning after December 15, 2019. The amendments related to the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements, and the narrative description of measurement uncertainty was to be applied prospectively. All other amendments were to be applied retrospectively. An entity was permitted to early adopt any removed or modified disclosures upon issuance of this guidance and delay adoption of the additional disclosures until their effective date. The adoption of this guidance did not have a material impact on our consolidated financial statements in the year ended December 31, 2020.

4. Notes Payable

Convertible Notes Payable

Convertible Note with EMA Financial, LLC

On July 30, 2020, RespireRx and EMA Financial, LLC ("EMA") entered into a Securities Purchase Agreement (the "EMA SPA") by which EMA provided a sum of $68,250 (the "EMA Consideration") to RespireRx, in return for a fixed rate convertible note (the "EMA Note") with a face amount of $75,000, and a common stock purchase warrant (the "EMA Warrant") for 375,000 shares of Common Stock (post-reverse stock split basis). The net proceeds received by RespireRx on August 4, 2020 were $63,750 after payment of $3,500 in EMA's legal fees and the withholding by EMA of $1,000 in diligence fees.

The EMA Note obligates RespireRx to pay by October 30, 2021 (the "EMA Maturity Date") a principal amount of $75,000 together with interest at a rate equal to 10% per annum, which principal exceeds the EMA Consideration by the amount of an original issue discount of $6,750. Any amount of principal or interest that is not paid by the EMA Maturity Date would bear interest at the rate of 24% from the EMA Maturity Date to the date such amount is paid.

EMA has the right, in its discretion, at any time, to convert any outstanding and unpaid amount of the EMA Note into shares of Common Stock, provided that such conversion would not result in EMA beneficially owning more than 4.99% of RespireRx's then outstanding Common Stock. In the absence of an event of default, EMA may convert at a per share conversion price equal to $0.02, subject to a retroactive downward adjustment if the lowest traded price on each of the three consecutive trading days following such conversion is lower than $0.02. Upon an event of default, the conversion price is adjusted downward based on a discount to market with respect to subsequent financings or a percentage of the lowest traded price during the twenty one day period prior to the conversion, if lower than $0.02. Upon such conversion, all rights with respect to the portion of the EMA Note being so converted terminate, except for the right to receive Common Stock or other securities, cash or other assets as provided in the EMA Note due upon such conversion.

RespireRx may, with prior written notice to EMA, prepay the outstanding principal amount under the EMA Note during the initial 180 day period by making a payment to EMA of an amount in cash equal to a certain percentage of the outstanding principal, interest, default interest and other amounts owed. Such percentage varies from 110% to 115% depending on the period in which the prepayment occurs, as set forth in the EMA Note.

If, prior to the repayment or conversion of the EMA Note, RespireRx consummates a registered, qualified or unregistered primary offering of its securities for capital raising purposes with aggregate net proceeds in excess of $2,500,000, EMA will have the right, in its discretion, to demand repayment in full of any outstanding principal, interest (including default interest) under the EMA Note as of the closing date of such offering.

The EMA SPA includes, among other things: (1) an automatic adjustment to the terms of the EMA SPA and related documents to the terms of a future financing if those terms are more beneficial to an investor than the terms of the EMA SPA and related documents are to EMA, subject to limited exceptions; and (2) certain registration rights. In addition, the EMA Note prohibits RespireRx from selling or otherwise disposing of a significant portion of its assets outside the ordinary course of business or in connection with a merger or consolidation or sale of all or substantially all of RespireRx's assets where the surviving or successor entity does not assume RespireRx's obligations under the EMA SPA. Further, any subsidiary to which RespireRx transfers a material amount of assets must guarantee certain obligations of RespireRx under the EMA Note.

The EMA Warrant is a common stock purchase warrant to purchase 375,000 shares of Common, for value received in connection with the issuance of the EMA Note, from the date of issuance of the EMA Warrant until September 30, 2023, at an exercise price of $0.07 (subject to adjustment as provided therein) per share of Common Stock.

The Company determined that there were no embedded derivatives to be identified, bifurcated and valued in connection with this financing.

The outstanding amounts of the EMA Note consists of the following at December 31, 2020 and December 31, 2019:

	December 31, 2020	December 31, 2019
Principal amount of notes payable	$ 75,000	$ -
Unamortized portion of note discounts	(18,417)	-
Accrued interest payable	3,164	-
	$ 59,747	$ -

Convertible Note and Equity Purchase Agreement with White Lion Capital, LLC

On July 28, 2020, RespireRx issued a convertible note, as amended ("Commitment Note") to White Lion Capital, LLC ("White Lion") pursuant to, and to induce White Lion to enter into an equity purchase agreement dated July 28, 2020 ("White Lion EPA"). See Note 9. Commitments and Contingencies - Entry into Equity Purchase Agreement for a description of the White Lion EPA and the other agreements entered into pursuant to the White Lion EPA. The Commitment Note had an initial face amount of $25,000 which was subsequently amended effective July 28, 2020 to $40,000 in consideration for an amendment to the White Lion EPA extending the date by which RespireRx was to file a registration statement on Form S-1 listing White Lion as the selling stockholder on Form S-1. The Commitment Note was accounted for as equity issuance costs in Additional paid-in capital.

The Commitment Note obligates RespireRx to pay by July 28, 2021 a principal amount of $40,000, together with a guaranteed interest payment of $3,200 representing an 8% per annum interest rate applied regardless of any payments or prepayments other than payments made by conversion of the Commitment Note. Upon an event of default, any amount of outstanding principal or interest would bear interest at the lower of 18% or the highest rate permitted by law.

White Lion has the right, at any time after the first 180 days after execution of the White Lion EPA, to convert any outstanding and unpaid amount (including accrued interest and other fees) into shares of Common Stock, provided that such conversion would not result in White Lion beneficially owning more than 9.99% of the Company's then outstanding Common Stock. Unless an event of default has occurred, White Lion may convert at a per share conversion price equal to $0.02. Upon such conversion, all rights with respect to the portion of the Commitment Note being so converted terminate, except for the right to receive Common Stock. White Lion also has the right, at any time the Commitment Note is outstanding, to apply any outstanding principal or interest as consideration for any equity, equity-linked and/or debt securities offered by the Company in any public offering or private placement, subject to the terms of the Commitment Note.

RespireRx may, with prior written notice to White Lion, prepay the entire outstanding principal amount under the Commitment Note at any time by making a payment to White Lion of an amount in cash equal to 110% of the outstanding principal, guaranteed interest amount, and any default interest or other amounts owed.

RespireRx determined that there were no embedded derivatives to be identified, bifurcated and valued in connection with this financing.

The outstanding amounts of the White Lion Note consist of the following at December 31, 2020 and December 31, 2019:

	December 31, 2020	December 31, 2019
Principal amount of notes payable	$ 40,000	$ -
Accrued interest payable	1,368	-
	$ 41,368	$ -

Convertible Note with FirstFire Global Opportunities Fund LLC

On July 2, 2020, RespireRx and FirstFire Global Opportunities Fund LLC ("FirstFire") entered into a Securities Purchase Agreement (the "FirstFire SPA") pursuant to which FirstFire provided a sum of $125,000 (the "FirstFire Consideration") to RespireRx, in return for a convertible promissory note (the "FirstFire Note") with a face amount of $137,500 (which difference in value as compared to the FirstFire Consideration is due to an original issue discount of $12,500), a common stock purchase warrant for 687,500 shares of the Company's common stock (post-reverse stock split basis) (the "FirstFire Warrant"), and the Confession of Judgment (as defined below), among other agreements and obligations. The net proceeds of the First Fire Consideration, which were received by RespireRx on July 6, 2020, equal $121,000 after payment of $4,000 in FirstFire's legal fees.

Under the terms of the FirstFire SPA and the FirstFire Note, FirstFire paid the FirstFire Consideration at closing. The FirstFire Note obligates RespireRx to pay interest at a rate of 10% per annum on any unpaid principal beginning on July 2, 2020, and to make five monthly amortization payments in the amount of $30,250 each, with the first such payment due on December 2, 2020, and the final such payment, along with any unpaid principal and any accrued and unpaid interest and other fees, due April 2, 2021 (the "FirstFire Note Maturity Date"). Any amount of principal or interest that is not paid when due bears interest at the rate of the lesser of 24% and the maximum amount permitted by law, from the due date to the date such amount is paid.

FirstFire has the right, at any time, to convert any outstanding and unpaid amount of the FirstFire Note into shares of RespireRx's Common Stock or securities convertible into RespireRx's common stock, provided that such conversion would not result in FirstFire beneficially owning more than 4.99% of RespireRx's then outstanding shares of Common Stock. Subject to certain limitations and adjustments as described in the FirstFire Note, FirstFire may convert at a per share conversion price equal to $0.02 (the "FirstFire Fixed Conversion Price"), provided that upon any event of default, the conversion price will equal the lower of (i) the FirstFire Fixed Conversion Price, (ii) discount to market based upon subsequent financings with other investors, or (iii) 60% multiplied by the lowest traded price of Common Stock during the twenty-one consecutive trading day period immediately preceding the date of such conversion. Upon such conversion, all rights with respect to the portion of the FirstFire Note being so converted terminate, except for the right to receive Common Stock or other securities, cash or other assets as provided in the FirstFire Note due upon such conversion.

RespireRx may, with prior written notice to FirstFire, prepay the outstanding principal amount under the FirstFire Note during the initial 180 day period after the execution of the FirstFire SPA by making a payment to FirstFire of an amount in cash equal to a certain percentage of the outstanding principal, interest, default interest and other amounts owed. Such percentage varies from 105% to 115% depending on the period in which the prepayment occurs.

The FirstFire SPA provides FirstFire with certain participation rights in any subsequent offering of debt or equity. Under the FirstFire SPA, RespireRx may not enter into an offering of its securities with terms that would benefit an investor more than FirstFire is benefited under the FirstFire SPA and the agreements ancillary thereto, unless RespireRx offers FirstFire those same terms. The FirstFire SPA also grants FirstFire certain registration rights.

The FirstFire Warrant is a warrant to purchase 687,500 shares of Common Stock, for value received in connection with the issuance of the FirstFire Note, from the date of issuance of the FirstFire Warrant until September 30, 2023, at an exercise price of $0.07 (subject to adjustment as provided therein) per share of common stock.

Additionally, RespireRx provided a confession of judgment (the "Confession of Judgment") in favor of FirstFire for the amount of the FirstFire Note plus fees and costs, to be filed pursuant to the terms and conditions of the FirstFire SPA and the FirstFire Note.

The Company determined that there were no embedded derivatives to be identified, bifurcated and valued in connection with this financing.

The outstanding amounts of the FirstFire Note consist of the following at December 31, 2020 and December 31, 2019:

	December 31, 2020	December 31, 2019
Principal amount of notes payable	$ 137,500	$ -
Unamortized portion of note discounts	(14,916)	-
Accrued interest payable	6,856	-
	$ 129,440	$ -

Convertible Notes with PowerUp Lending Group Ltd.

RespireRx and PowerUp Lending Group Ltd. ("PowerUp") entered into two securities purchase agreements, dated as of April 15, 2020 and June 7, 2020 (each, a "PowerUp Agreement"), by which Power Up loaned $53,000 and $43,000, respectively, to RespireRx in return for two convertible promissory notes (the "April 2020 Note" and the "June 2020 Note" respectively), a limited guaranty associated with the April 2020 Note, and the delivery into escrow of a confession of judgment in favor of Power Up for the amount of the April 2020 Note plus fees and costs to be filed by Power Up upon the occurrence of an Event of Default (as defined in the April 2020 Note) and other transaction-related documents associated with both the April 2020 Note and the June 2020 Note. The proceeds of the loans, which equal $90,000 after payment of $5,000 in legal fees and $1,000 in due diligence fees, were used for general corporate purposes.

The April 2020 Note was repaid by conversion in October 2020. The June 2020 Note which would have payable on June 7, 2021, (the "June 2020 Note Maturity Date"), and bears interest at a rate equal to 12% per annum, with any amount of principal or interest which is not paid when due bearing interest at the rate of 22% per annum was paid in full in December 2020.

There were no outstanding amounts due with respect to the April 2020 Note and June 2020 Note as of December 31, 2020.

On October 22, 23 and 26, 2020, Power Up converted the outstanding principal amount and all accrued and unpaid interest related to the April 2020 Note into 2,080,740 shares of Common Stock and as of October 26, 2020 the April 2020 Note is deemed repaid and terminated. On December 14, 2020 and December 15, 2020, converted the outstanding principal amount and all accrued and unpaid interest related to the June 2020 Note into 3,506,153 shares of Common Stock (post-reverse stock split basis) and the June 2020 Note is deemed repaid and terminated.

2019 Convertible Notes

On April, 24, 2019, May 17, 2019, August 19, 2019, October 22, 2019 and November 4, 2019, the Company issued a series of convertible notes ("2019 Convertible Notes"), all similar in nature, all subject to debt issuance costs ("DIC") and original issue discount ("OID") and beneficial conversion ("BCF") features and some subject to the issuance of warrants ("NW") and/or commitment shares ("CS") and placement agent fees. Two of the notes had maturity dates nine months after issuance and three were for one year. One note was a master note agreement in the amount of $150,000, but with an initial drawdown of $50,000. The Company evaluated all of the terms of the 2019 Convertible Notes and determined that, in accordance with ASC 815, there were no derivatives to be bifurcated or separately valued. Each of the April, 24, 2019, May 17, 2019, August 19, 2019, October 22, 2019 and November 4, 2019 Convertible Notes was satisfied in full by the lenders electing to convert the outstanding balances to Common Stock, except for $2,747 of accrued interest that remains outstanding under the May 17, 2019 Convertible Note.

Inception date	Maturity date	Original principal amount	Interest rate	Original aggregate DIC, OID, BCF, NW and CS	Cumulative amortization of DIC, OID, BCF, NW and CS	Principal remaining at December 31, 2020	Accrued Interest at December 31, 2020	Balance sheet carrying amount at December 31, 2020 inclusive of accrued interest
May 17, 2019	May 17, 2020, extended to November 17, 2020	$ 50,000	10%	$ 50,000	$ 50,000	$ -	$ 2,747	$ 2,747
	Total	$ 50,000		$ 50,000	$ 50,000	$ -	$ 2,747	$ 2,747

On December 6, 2018, December 7, 2018 and December 31, 2018 the Company issued convertible notes (each a "2018 Q4 Note") and on January 2, 2019, February 27, 2019, March 6, 2019 and March 14, 2019, the Company issued additional convertible notes (each a "2019 Q1 Note", respectively and collectively with the "2018 Q4, the "2018 Q4 and 2019 Q1 Notes") bearing interest at 10% per year. All of the 2018 Q4 and 2019 Q1 Notes matured on either February 28, 2019 or April 30, 2019. The original aggregate principal amount was $190,000. None of the 2018 Q4 and 2019 Q1 Notes were repaid at maturity. The 2018 Q4 and 2019 Q1 Note investors also received an aggregate of 19,000 common stock purchase warrants. The warrants were valued using the Black Scholes option pricing model calculated on the date of each grant and had an aggregate value of $146,805. Total value received by the investors was $336,805, the sum of the face value of the convertible note and the value of the warrant. Therefore, the Company recorded a debt discount associated with the warrant issuance of $82,159 and an initial value of the convertible notes of $107,841 using the relative fair value method. All debt discounts were fully amortized by the original maturity dates. On March 21, 2020, all except one of the 2018 Q4 and 2019 Q1 Note holders exchanged the outstanding principal amount and accrued interest for shares of common stock. The exchange price was $0.15 per share of common stock. The closing price on March 20, 2020, the last trading day before the closing of the exchange agreements which took place on a Saturday, was $0.34 per share of common stock. An aggregate of $155,000 of principal and $17,911 of accrued interest was exchanged for 1,152,740 shares of common stock. The Company recorded a loss on the extinguishment of the exchanged 2018 Q4 Notes and 2019 Q1 Notes of $219,021. As of December 31, 2020, there remains one outstanding 2018 Q4 Note and one outstanding 2019 Q1 Note, both held by the same single investor, with an aggregate principal amount of $35,000 and aggregate accrued interest of $7,201 as of December 31, 2020. The 2019 Convertible Notes discussed above, which the Company does not consider to have arisen from one or more offerings, may be interpreted in such a way that the remaining 2018 Q4 Note and 2019 Q1 Note holders had the right to convert or exchange into such notes. However, no holder of the Q4 2018 and 2019 Notes has requested such a conversion or exchange. The Company does not believe that an offering occurred as of December 31, 2020 or as of the date of the issuance of these financial statements. Therefore, the number of shares of common stock (or preferred stock) into which the remaining 2018 Q4 Note and the remaining 2019 Q1 Note may convert is not determinable and the Company has not accounted for any additional consideration. The warrants to purchase 19,000 shares of common stock issued in connection with the sale of the 2018 Q4 and 2019 Q1 Notes are exercisable at a fixed price of $15.00 per share of common stock, provide no right to receive a cash payment, and included no reset rights or other protections based on subsequent equity transactions, equity-linked transactions or other events. The warrants issued to the Q4 2018 and Q1 2019 Note holders expire on December 30, 2023. The Company determined that there were no embedded derivatives to be identified, bifurcated and valued in connection with this financing.

The 2018 Q4 Notes and 2019 Q1 Notes consist of the following at December 31, 2020 and December 31, 2019:

	December 31, 2020	December 31, 2019
Principal amount of notes payable	$ 35,000	$ 190,000
Accrued interest payable	7,201	17,976
	$ 42,201	$ 207,976

Other convertible notes were also sold to investors in 2014 and 2015 (the "Original Convertible Notes), which aggregated a total of $579,500, and had a fixed interest rate of 10% per annum. The Original Convertible Notes have no reset rights or other protections based on subsequent equity transactions, equity-linked transactions or other events. The warrants to purchase shares of common stock issued in connection with the sale of the Original Convertible Notes have either been exchanged for common stock or expired.

On March 21, 2020, the holder of one of the Original Convertible Notes exchanged $50,000 of principal and $32,875 of accrued interest for 552,501 shares of the Company's common stock. The exchange price was $0.15 per share of common stock. The closing price on March 20, 2020, the last trading day before the closing of the exchange agreements, was $0.34 per share of common stock. The Company recorded a loss on the extinguishment of the exchanged Original Convertible Note of $104,975.

The remaining outstanding Original Convertible Notes (including that for which a default notice has been received) consist of the following at December 31, 2020 and December 31, 2019:

	December 31, 2020	December 31, 2019
Principal amount of notes payable	$ 75,000	$ 125,000
Accrued interest payable	64,357	82,060
	$ 139,357	$ 207,060

As of December 31, 2020, principal and accrued interest on the Original Convertible Note that is subject to a default notice accrues annual interest at 12% instead of 10%, totaled $48,700, of which $23,700 was accrued interest. As of December 31, 2019, principal and accrued interest on Original Convertible Notes subject to default notices totaled $43,666 of which $18,666 was accrued interest.

As of December 31, 2020 all of the outstanding Original Convertible Notes, inclusive of accrued interest, were convertible into an aggregate of 1,225 shares of the Company's common stock (post-reverse stock split basis). Such Original Convertible Notes will continue to accrue interest until exchanged, paid or otherwise discharged. There can be no assurance that any of the additional holders of the remaining Original Convertible Notes will exchange their Original Convertible Notes.

Note Payable to SY Corporation Co., Ltd.

On June 25, 2012, the Company borrowed 465,000,000 Won (the currency of South Korea, equivalent to approximately $400,000 United States Dollars) from and executed a secured note payable to SY Corporation Co., Ltd., formerly known as Samyang Optics Co. Ltd. ("SY Corporation"), an approximately 20% common stockholder of the Company at that time. SY Corporation was a significant stockholder and a related party at the time of the transaction, but has not been a significant stockholder or related party of the Company subsequent to December 31, 2014. The note accrues simple interest at the rate of 12% per annum and had a maturity date of June 25, 2013. The Company has not made any payments on the promissory note. At June 30, 2013 and subsequently, the promissory note was outstanding and in default, although SY Corporation has not issued a notice of default or a demand for repayment. The Company believes that SY Corporation is in default of its obligations under its January 2012 license agreement, as amended, with the Company, but the Company has not yet issued a notice of default. The Company intends to continue efforts towards a comprehensive resolution of the aforementioned matters involving SY Corporation.

The promissory note is secured by collateral that represents a lien on certain patents owned by the Company, including composition of matter patents for certain of the Company's high impact ampakine compounds and the low impact ampakine compounds CX2007 and CX2076, and other related compounds. The security interest does not extend to the Company's patents for its ampakine compounds CX1739 and CX1942, or to the patent for the use of ampakine compounds for the treatment of respiratory depression.

Note payable to SY Corporation consists of the following at December 31, 2020 and 2019:

	December 31, 2020	December 31, 2019
Principal amount of note payable	$ 399,774	$ 399,774
Accrued interest payable	411,384	363,280
Foreign currency transaction adjustment	53,393	3,182
	$ 864,551	$ 766,236

Interest expense with respect to this promissory note was $48,104 and $47,971 for years ended December 31, 2020 and 2019, respectively.

Advances from and Notes Payable to Officers

On January 29, 2016, Dr. Arnold S. Lippa, the Company's Interim President, Interim Chief Executive Officer, Chief Scientific Officer and Chairman of the Board of Directors, advanced $52,600 to the Company for working capital purposes under a demand promissory note with interest at 10% per annum. On September 23, 2016, Dr. Lippa advanced $25,000 to the Company for working capital purposes under a second demand promissory note with interest at 10% per annum. The notes are secured by the assets of the Company. Additionally, on April 9, 2018, Dr. Lippa advanced another $50,000 to the Company as discussed in more detail below.

On February 2, 2016, Dr. James S. Manuso, the Company's then Chief Executive Officer and Vice Chairman of the Board of Directors, advanced $52,600 to the Company for working capital purposes under a demand promissory note with interest at 10% per annum. On September 22, 2016, Dr. Manuso, advanced $25,000 to the Company for working capital purposes under a demand promissory note with interest at 10% per annum. The notes are secured by the assets of the Company. Additionally, on April 9, 2018, Dr. Manuso advanced another $50,000 to the Company as discussed in more detail below.

On April 9, 2018, Dr. Arnold S. Lippa, the Company's Interim President, Interim Chief Executive Officer, Chief Scientific Officer and Chairman of the Board of Directors and Dr. James S. Manuso, the Company's then Chief Executive Officer and Vice Chairman of the Board of Directors, advanced $50,000 each, for a total of $100,000, to the Company for working capital purposes. Each note is payable on demand after June 30, 2018. Each note was subject to a mandatory exchange provision that provided that the principal amount of the note would be mandatorily exchanged into a board approved offering of the Company's securities, if such offering held its first closing on or before June 30, 2018 and the amount of proceeds from such first closing was at least $150,000, not including the principal amounts of the notes that would be exchanged, or $250,000 including the principal amounts of such notes. Upon such exchange, the notes would be deemed repaid and terminated. Any accrued but unpaid interest outstanding at the time of such exchange will be (i) repaid to the note holder or (ii) invested in the offering, at the note holder's election. A first closing did not occur on or before June 30, 2018. Dr. Arnold S. Lippa agreed to exchange his note into the board approved offering that had its initial closing on September 12, 2018. Accrued interest on Dr. Lippa's note was not exchanged. As of December 31, 2020, Dr. James S. Manuso had not exchanged his note.

During the year ended December 31, 2020, Dr. Lippa advanced on an interest free basis the Company $65,000 of which $16,036 was repaid to Dr. Lippa. The outstanding balance of the advance is payable on demand.

During the year ended December 31, 2020, Mr. Margolis advanced $10,775 to which when aggregated with the outstanding balance of $5,500 as of the beginning of the fiscal year, was $16,275, all of which was repaid by the Company during the fiscal year ended December 31, 2020.

For the fiscal years ended December 31, 2020 and 2019, $11,329 and $10,272 was charged to interest expense with respect to Dr. Lippa's notes, respectively.

For the fiscal years ended December 31, 2020 and 2019, $16,988 and $15,416 was charged to interest expense with respect to Dr. James S. Manuso's notes, respectively.

As of September 30, 2018, Dr. James S. Manuso resigned his executive officer positions and as a member of the Board of Directors of the Company. All of the interest expense noted above for 2020 and 2019 was incurred while Dr. Manuso was no longer an officer.

Other Short-Term Notes Payable

Other short-term notes payable at December 31, 2020 and December 31, 2019 consisted of premium financing agreements with respect to various insurance policies. At December 31, 2020, a premium financing agreement was payable in the initial amount of $70,762, with interest at 11% per annum, in ten monthly installments of $8,256, and another premium financing arrangement was payable in the initial amount of $9,215 payable in equal quarterly installments. At December 31, 2020 and 2019, the aggregate amount of the short-term notes payable was $4,608 and $4,635 respectively.

5. Settlement and Payment Agreements

On February 21, 2020, Sharp Clinical Services, Inc. ("Sharp"), a vendor of the Company, filed a complaint against the Company in the Superior Court of New Jersey Law Division, Bergen County related to a December 16, 2019 demand for payment of past due invoices inclusive of late fees totaling $103,890 of which $3,631 related to late fees, seeking $100,259 plus 1.5% interest per month on outstanding unpaid invoices. Amid settlement discussions, the vendor stated on March 13, 2020 its intent to proceed to a default judgment against the Company, and the Company stated on March 14, 2020 its intent to continue settlement discussions. On May 29, 2020, a default was entered against the Company, and on September 4, 2020, a final judgment by default was entered against the Company in the amount of $104,217. The Company has recorded a liability to Sharp of $103,859 as of December 31, 2020.

On February 23, 2021 our bank received two New Jersey Superior Court Levies totaling $320,911 related to amounts owed to two vendors (Sharp and Salamandra as defined below and herein) which amounts were not in dispute, debited our accounts and restricted access to those accounts. Our accounts were debited for $1,559 on February 23, 2021 which represented all of the cash in our accounts on that date.

On March 3, 2021, we executed a settlement agreement with one of the two vendors noted below (the "Sharp Settlement Agreement"). The Sharp Settlement Agreement calls for a payment schedule totaling $100,000 in ten bi-monthly installments which began on April 1, 2021 and are due every other month thereafter and permits early settlement at $75,000 if the Company pays Sharp that lower total by August 1, 2021. The first $10,000 payment that which was due on April 1, 2021, was paid on March 23, 2021. On March 9, 2021, Sharp requested of the Bergen (NJ) County Sheriff, the return of the Writ of Execution which resulted in a release of the lien.

By letter dated February 5, 2016, the Company received a demand from a law firm representing Salamandra, LLC ("Salamandra") alleging an amount due and owing for unpaid services rendered. On January 18, 2017, following an arbitration proceeding, an arbitrator awarded Salamandra the full amount sought in arbitration of $146,082. Additionally, the arbitrator granted Salamandra attorneys' fees and costs of $47,937. All such amounts have been accrued as of December 31, 2020 and December 31, 2019, including accrued interest at 4.5% annually from February 26, 2018, the date of the judgment, through December 31, 2020, totaling $24,129.

On August 21, 2019, RespireRx and Salamandra entered into a settlement agreement and release, which was amended on December 16, 2019 (as amended, the "Salamandra Settlement Agreement"), regarding $202,395 owed by the Company to Salamandra (as reduced by any further payments by the Company to Salamandra, the "Full Amount") in connection with the above-mentioned arbitration award. Under the Salamandra Settlement Agreement, (i) the Company paid to Salamandra $25,000 before December 21, 2019, and upon such payment, Salamandra ceased all collection efforts against the Company until March 31, 2020, and (ii) the Company was to pay to Salamandra by March 31, 2020 an amount equal to 21% of the working capital amount raised by that date, which would have reduced the Full Amount owed on a dollar-for-dollar basis. The Company did not make the required payment on March 31, 2020 and has not made any subsequent payments other than what may have been received by Salamandra pursuant to the levies described above.

On September 23, 2019, the Company and a vendor agreed in principle to a proposed settlement agreement, which has not resulted in a formal agreement. In February 2020, the Company and the vendor discussed amendments to this agreement in principal. The discussions included, among other things, an extension of time to raise the amount discussed below. The Company and the vendor are continuing discussions in an attempt to reach a formal settlement agreement.

The due date of the $100,000 annual amount payable to the University of Illinois that was originally due on December 31, 2020 pursuant to the 2014 License Agreement was extended to April 19, 2021 and was paid in full on April 1, 2021.

By email dated July 21, 2016, the Company received a demand from an investment banking consulting firm that represented the Company in 2012 in conjunction with the Pier transaction alleging that $225,000 is due and payable for investment banking services rendered. Such amount has been included in accrued expenses at December 31, 2020 and December 31, 2019.

The Company is periodically the subject of various pending and threatened legal actions and claims. In the opinion of management of the Company, adequate provision has been made in the Company's consolidated financial statements as of December 31, 2020 and December 31, 2019 with respect to such matters, including, specifically, the matters noted above. The Company intends to vigorously defend itself if any of the matters described above results in the filing of a lawsuit or formal claim.

6. Stockholders' Deficiency

Preferred Stock

RespireRx has authorized a total of 5,000,000 shares of preferred stock, par value $0.001 per share. As of December 31, 2020 and December 31, 2019, 1,250,000 shares were designated as 9% Cumulative Convertible Preferred Stock; 37,500 shares were designated as Series B Convertible Preferred Stock (non-voting, "Series B Preferred Stock"); 205,000 shares were designated as Series A Junior Participating Preferred Stock; 1,700 shares were designated as Series G 1.5% Convertible Preferred Stock. On July 13, 2020, RespireRx designated 1,200 shares of Series H, Voting, Non-participating, Convertible Preferred Stock ("Series H Preferred Stock") and on September 30, 2020 RespireRx amended the Certificate of Designation of the Series H Preferred Stock to increase the number of shares of Series H Preferred Stock to 3,000 shares. On July 13, 2020 and September 30, 2020, RespireRx issued an aggregate of 1,624.1552578 shares of Series H Preferred Stock inclusive of 2% accrued dividends, all of which converted on September 30, 2020 into 25,377,426 shares of Common Stock and warrants to purchase 25,377,426 shares of Common Stock, and therefore as of that time on September 30, 2020, there were no shares of Series H Preferred Stock outstanding. Under the Certificate of Designation of the Series H Preferred Stock, shares of Series H Preferred Stock converted or redeemed by conversion are to be canceled and are not to be reissued. Accordingly, on December 31, 2020 and 2019, 3,504,424.1552578 shares of preferred stock and 3,505,800 shares of preferred stock, respectively, were undesignated and were able to be issued with such rights and powers as the Board of Directors may designate.

Series B Preferred Stock outstanding as of December 31, 2020 and 2019 consisted of 37,500 shares issued in a May 1991 private placement. Each share of Series B Preferred Stock is convertible into approximately 0.000030 shares of common stock at an effective conversion price of $22,083.75 per share of common stock, which is subject to adjustment under certain circumstances. As of December 31, 2020 and December 31, 2019, the shares of Series B Preferred Stock outstanding are convertible into 1 share of common stock. RespireRx may redeem the Series B Preferred Stock for $25,001, equivalent to $0.6667 per share, an amount equal to its liquidation preference, at any time upon 30 days prior notice.

Common Stock

There are 71,271,095 shares of the Company's Common Stock outstanding as of December 31, 2020. After reserving for conversions of convertible debt as well as common stock purchase options and warrants exercises before accounting for incremental contract excess reserves, there were 1,870,650,077 shares of the Company's Common Stock available for future issuances as of December 31, 2020. After accounting for incremental excess reserves required by the FirstFire Note, the EMA Note, the Crown Bridge unpaid accrued interest, and the White Lion Note as well the FirstFire Warrant, the EMA warrant, aggregating 68,777,142 and other outstanding convertible notes and all outstanding options and warrants, there were 1,801,872,935, shares of common stock available for future issuances as of December 31, 2020. Each conversion or exercise on a convertible note, or option or warrant, as appropriate reduces the excess reserve requirements. The FirstFire Note and EMA Note were converted in full in 2021 and the White Lion Note was converted in part in 2021. No warrants or options were exercised after December 31, 2020. See Note 10. Subsequent Events in the notes to our consolidated financial statements as of December 31, 2020.

Common Stock Warrants

As part of our prior debt financings with FirstFire, EMA and Crown Bridge, the Company issued warrants that contained anti-dilution provisions that required a reduction to the exercise price and an increase to the number of warrant shares in the event that we issued equity instruments with a lower price than the exercise price. During the year ended December 31, 2020, we adjusted downward the warrant exercise price for these warrants. The resulting fair value of the warrants with the new exercise price was $1,440,214, recorded as a deemed dividend in our consolidated statements of stockholders' deficiency. As the Company has an accumulated deficit, the deemed dividend was recorded within additional paid-in capital.

On September 30, 2020, the Company issued warrants exercisable into 25,377,426 of commons stock at $0.07 per share and expiring on September 30, 2023 which issuance occurred upon the conversion of all Series H Preferred Stock into common stock and warrants on September 30, 2020.

On July 30, 2020, the Company issued warrants exercisable into 375,000 shares of common stock at an exercise price of $0.07 per share and expiring on September 30, 2023.

On July 2, 2020, the Company issued warrants exercisable into 687,500 shares of common stock at an exercise price of $0.07 per share and expiring on September 30, 2023.

During the fiscal year ended December 31, 2020, inclusive of anti-dilution provisions, the Company issued warrants exercisable into 13,145,114 shares of common stock at exercise prices ranging from $0.01485 to $0.03416 of which 10,969,352 were exercised.

A summary of warrant activity for the year ended December 31, 2020 is presented below.

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (in Years)
Warrants outstanding at December 31, 2019	219,104	$ 18.7109	3.44
Issued	39,585,040	0.0521	2.89
Expired	(25,434)	2.9899	
Exercised	(10,969,352)	0.0161	
Warrants outstanding at December 31, 2020	28,809,352	$ 0.1528	2.64
Warrants exercisable at December 31, 2019	219,104	$ 18.7109	3.44
Warrants exercisable at December 31, 2020	28,809,352	$ 0.1528	2.64

The exercise prices of common stock warrants outstanding and exercisable are as follows at December 31, 2020:

Exercise Price	Warrants Outstanding (Shares)	Warrants Exercisable (Shares)	Expiration Date
$ 0.0160	2,212,500	2,212,500	May 17, 2022
$ 0.0700	26,439,926	26,439,926	September 30, 2023
$ 15.000	19,000	19,000	December 30, 2023
$ 15.750	23,881	23,881	April 30, 2023
$ 27.500	800	800	December 31, 2021
$ 11.000	104,650	104,650	September 29, 2022
$ 79.300	8,595	8,595	February 28, 2021
	28,809,352	29,809,352	

Based on a fair value of $0.029 per share on December 31, 2020, there were 2,212,500 exercisable in-the money common stock warrants with an intrinsic value of $28,763 as of December 31, 2020.

A summary of warrant activity for the year ended December 31, 2019 is presented below.

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (in Years)
Warrants outstanding at December 31, 2018	178,322	$ 22.0393	3.06
Issued	47,737	7.9079	4.36
Expired	(6,955)	29.8989	-
Warrants outstanding at December 31, 2019	219,104	$ 18.7109	3.44
Warrants exercisable at December 31, 2018	178,322	$ 22.0393	3.06
Warrants exercisable at December 31, 2019	219,104	$ 18.7109	3.44

Stock Options

On March 18, 2014, RespireRx adopted its 2014 Equity, Equity-Linked and Equity Derivative Incentive Plan (the "2014 Plan"). The Plan permits the grant of options and restricted stock with respect to up to 325,025 shares of common stock, in addition to stock appreciation rights and phantom stock, to directors, officers, employees, consultants and other service providers of the Company.

On June 30, 2015, the Board of Directors adopted the 2015 Stock and Stock Option Plan (as amended, the "2015 Plan"). As of March 31, 2020, there were 8,985,260 shares that may be issued under the 2015 Plan. On May 5, 2020 the Board of Directors increased the number of shares that may be issued under the 2015 Plan to 58,985,260. On July 31, 2020 the Board of Directors increased the number of shares that may be issued under the 2015 Plan to 158,985,260. The Company has not and does not intend to present the 2015 Plan to stockholders for approval.

Other than the change in the number of shares available under the 2015 Plan, no other changes were made to the 2015 Plan by these amendments noted above.

There were no stock grants and there were stock option grants for 6,750,000 shares of RespireRx's Common Stock during the fiscal year ended December 31, 2020 and there were no stock grants or stock option grants in the during the fiscal year ended December 31, 2019.

Information with respect to the Black-Scholes variables used in connection with the evaluation of the fair value of stock-based compensation costs and fees is provided at Note 3 Summary of Significant Accounting Policies.

A summary of stock option activity for the fiscal year ended December 31, 2020 is presented below.

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (in Years)
Options outstanding at December 31, 2019	428,761	$ 33.798	4.98
Granted	6,750,000	0.0660	4.63
Expired	(13,546)	(65.9190)	-
Options outstanding at December 31, 2020	7,165,215	$ 1.961	4.60
Options exercisable at December 31, 2020	6,290,215	$ 2.225	4.59

The exercise prices of common stock options outstanding and exercisable were as follows at December 31, 2020:

Exercise Price	Options Outstanding (Shares)	Options Exercisable (Shares)	Expiration Date
$ 0.072	5,050,000	4,525,000	September 30, 2025
$ 0.054	1,700,000	1,350,000	July 31, 2025
$ 7.000	2,168	2,168	November 21, 2023
$ 11.200	31,038	31,038	April 5, 2023
$ 12.500	1,676	1,676	December 7, 2022
$ 13.500	3,400	3,400	July 28, 2022
$ 14.500	184,942	184,942	December 9, 2027
$ 14.500	10,000	10,000	December 9, 2027
$ 20.000	28,500	28,500	June 30, 2022
$ 20.000	2,500	2,500	July 26, 2022
$ 39.000	39,500	39,500	January 17, 2022
$ 45.000	722	722	September 2, 2021
$ 57.500	261	261	September 12, 2021
$ 64.025	12,923	12,923	August 18, 2022
$ 64.025	26,179	26,179	August 18, 2025
$ 73.775	52,308	52,308	March 31, 2021
$ 81.250	16,923	16,923	June 30, 2022
$ 139.750	339	339	March 14, 2024
$ 159.250	246	246	February 28, 2024
$ 195.000	949	949	July 17, 2022
$ 195.000	641	641	August 10, 2022
	7,165,215	6,290,215	

Based on a fair value of $0.029 per share on December 31, 2020, there were no exercisable in-the-money common stock options as of December 31, 2020.

A summary of stock option activity for the year ended December 31, 2019 is presented below.

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (in Years)
Options outstanding at December 31, 2018	434,499	$ 35.414	5.90
Expired	(5,738)	156.139	-
Options outstanding at December 31, 2019	428,761	$ 33.798	4.98
Options exercisable at December 31, 2018	434,499	$ 35.414	5.90
Options exercisable at December 31, 2019	428,761	$ 33.789	4.98

The exercise prices of common stock options outstanding and exercisable were as follows at December 31, 2019:

Exercise Price	Options Outstanding (Shares)	Options Exercisable (Shares)	Expiration Date
$ 7.000	2,168	2,168	November 21, 2023
$ 11.200	31,038	31,038	April 5, 2023
$ 12.500	1,676	1,676	December 7, 2022
$ 13.500	3,400	3,400	July 28, 2022
$ 14.500	184,942	184,942	December 9, 2027
$ 14.500	10,000	10,000	December 9, 2027
$ 20.000	28,500	28,500	June 30, 2022
$ 20.000	2,500	2,500	July 26, 2022
$ 39.500	39,500	39,500	January 17, 2022
$ 45.000	722	722	September 2, 2021
$ 56.875	8,969	8,969	June 30, 2020
$ 57.500	261	261	September 12, 2021
$ 64.025	2,769	2,769	August 18, 2020
$ 64.025	12,923	12,923	August 18, 2022
$ 64.025	26,179	26,179	August 18, 2025
$ 68.250	879	879	December 11, 2020
$ 73.775	52,308	52,308	March 31, 2021
$ 81.250	16,923	16,923	June 30, 2022
$ 139.750	339	339	March 14, 2024
$ 154.700	775	755	April 8, 2020
$ 159.250	246	246	February 28, 2024
$ 166.400	154	154	January 29, 2020
$ 195.000	949	949	July 17, 2022
$ 195.000	641	641	August 10, 2022
	428,761	428,761	

Based on a fair value of $1.00 per share on December 31, 2019, there were 0 exercisable in-the-money common stock options as of December 31, 2019.

For the years ended December 31, 2020 and 2019, stock-based compensation costs and fees included in the consolidated statements of operations consisted of general and administrative expenses of $345,500 and $0 respectively, and research and development expenses of $38,750 and $0, respectively.

Pier Contingent Stock Consideration

In connection with the merger transaction with Pier effective August 10, 2012, RespireRx issued 17,975 newly issued shares of its common stock with an aggregate fair value of $3,271,402 ($182.00 per share), based upon the closing price of RespireRx's common stock on August 10, 2012. The shares of common stock were distributed to stockholders, convertible note holders, warrant holders, option holders, and certain employees and vendors of Pier in satisfaction of their interests and claims. The common stock issued by RespireRx represented approximately 41% of the 44,321 common shares outstanding immediately following the closing of the transaction.

The Company concluded that the issuance of any of the contingent shares to the Pier Stock Recipients was remote, as a result of the large spread between the exercise prices of these stock options and warrants as compared to the common stock trading range, the subsequent expiration or forfeiture of most of the options and warrants, the Company's distressed financial condition and capital requirements, and that these stock options and warrants have remained significantly out-of-the-money through December 31, 2020. Accordingly, the Company considered the fair value of the contingent consideration to be immaterial and therefore did not ascribe any value to such contingent consideration. If any such shares are ultimately issued to the former Pier stockholders, the Company will recognize the fair value of such shares as a charge to operations at that time.

Reserved and Unreserved Shares of Common Stock

On January 17, 2017, the Board of Directors of the Company approved the adoption of an amendment of the Amended and Restated RespireRx Pharmaceuticals, Inc. 2015 Stock and Stock Option Plan (as amended, the "2015 Plan"). That amendment increased the shares issuable under the plan by 150,000, from 153,846 to 303,846. On December 9, and December 28, 2018, the Board of Directors further amended the 2015 Plan to increase the number of shares that may be issued under the 2015 Plan to 698,526 and 898,526 shares of the Company's common stock. On May 5, 2020 and July 31, 2020, the Board of Directors further amended the 2015 Plan to increase the number of shares that may be issued under the 2015 Plan by 5,000,000 and 10,000,000 shares respectively. As of December 31, 2020, there are 8,704,251 shares of common stock available for issuance under the 2015 Plan.

Other than the change in the number of shares available under the 2015 Plan, no other changes were made to the 2015 Plan by these amendments noted above.

At December 31, 2020, the Company had 2,000,000,000 shares of common stock authorized and 71,271,095 shares of common stock issued and outstanding. The Company has reserved 1 shares of common stock for the conversion of the Series B Preferred Stock. The Company has reserved an aggregate of 13,333,036 for the calculated amount of shares of common stock into which convertible notes may convert and an additional 53,464,642 shares of common stock for contractual reserves with respect to such notes. In addition, The Company has reserved 7,165,215 and 28,809,352 shares of the Company's common stock for exercises of common stock purchase options granted and warrants issued respectively and an additional 15,312,500 shares of common stock for contractual reserves associated with certain of the warrants. The Company has reserved 649 shares of common stock with respect to the Pier contingent shares. There are 8,770,576 shares reserved for future issuances under the Company's 2014 Plan and 2015 Plan. Accordingly, after taking into consideration the shares of common stock reserved for all conversions, exercises, contingent share issuances and contractual reserves, there were 1,801,872,935 shares of the Company's common stock available for future issuances as of December 31, 2020.

7. Income Taxes

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of the Company's deferred tax assets as of December 31, 2020 and 2019 are summarized below.

	December 31,	
	2020	**2019**
Capitalized research and development costs	$ -	$ -
Research and development credits	3,017,000	3,017,000
Stock-based compensation	3,975,000	3,787,000
Stock options issued in connection with the payment of debt	202,000	202,000
Net operating loss carryforwards	20,536,000	19,982,000
Accrued compensation	155,000	586,000
Accrued interest due to related party	146,000	217,000
Other, net	8,000	8,000
Total deferred tax assets	28,039,000	27,799,000
Valuation allowance	(28,039,000)	(27,799,000)
Net deferred tax assets	$ -	$ -

In assessing the potential realization of deferred tax assets, management considers whether it is more likely than not that some portion or all of the deferred tax assets will be realized. The ultimate realization of deferred tax assets is dependent upon the Company attaining future taxable income during the periods in which those temporary differences become deductible. As of December 31, 2020 and 2019, management was unable to determine that it was more likely than not that the Company's deferred tax assets will be realized, and has therefore recorded an appropriate valuation allowance against deferred tax assets at such dates.

No federal tax provision has been provided for the years ended December 31, 2020 and 2019 due to the losses incurred during such periods. Reconciled below is the difference between the income tax rate computed by applying the U.S. federal statutory rate and the effective tax rate for the years ended December 31, 2020 and 2019.

	Years Ended December 31,	
	2020	2019
U. S. federal statutory tax rate	(21.0)%	(21.0)%
Change in valuation allowance	(1.0)%	(1.0)%
Adjustment to deferred tax asset	22.0%	22.0%
Other	-%	-%
Effective tax rate	0.0%	0.0%

As of December 31, 2020, the Company had federal and state tax net operating loss carryforwards of approximately $104,166,000 and $44,252,000, respectively. The state tax net operating loss carryforward consists of $19,673,000 for California purposes and $24,579,000 for New Jersey purposes. The difference between the federal and state tax loss carryforwards was primarily attributable to the capitalization of research and development expenses for California franchise tax purposes. The federal net operating loss carryforwards will expire at various dates from 2021 through 2040. State net operating losses expire at various dates from 2021 through 2029 for California and through 2040 for New Jersey. The Company also had federal and California research and development tax credit carryforwards that totaled approximately $1,871,000 and $1,146,000, respectively at December 31, 2020. The federal research and development tax credit carryforwards will expire at various dates from 2021 through 2032. The California research and development tax credit carryforward does not expire and will carryforward indefinitely until utilized.

While the Company has not performed a formal analysis of the availability of its net operating loss carryforwards under Internal Revenue Code Sections 382 and 383, management expects that the Company's ability to use its net operating loss carryforwards will be limited in future periods.

The Company has not filed its federal and state tax returns for the year ended December 31, 2020, for which the Company has filed a request for extension of time to file such returns. The Company does not expect there to be any material non-filing penalties. The Company intends to file such returns as soon as practical.

8. Related Party Transactions

Dr. Arnold S. Lippa and Jeff E. Margolis, officers and directors of the Company since March 22, 2013, have indirect ownership interests and managing memberships in Aurora Capital LLC ("Aurora") through interests held in its members, and Jeff. E. Margolis is also an officer of Aurora. Aurora is a boutique investment banking firm specializing in the life sciences sector that limits its securities related activities primarily to investment banking services.

A description of advances and notes payable to officers is provided at Note 4. Notes Payable – Advances from and Notes Payable to Officer.

9. Commitments and Contingencies

Pending or Threatened Legal Action and Claims

The Company is periodically the subject of various pending and threatened legal actions and claims. In the opinion of management of the Company, adequate provision has been made in the Company's consolidated financial statements as of December 31, 2020 and 2019 with respect to such matters. See Note 5. Settlement and Payment Agreements to the consolidated financial statements as of December 31, 2020 for additional items and details.

Significant Agreements and Contracts

Consulting Agreements

Richard Purcell, the Company's Senior Vice President of Research and Development since October 15, 2014, provides his services to the Company on a month-to-month basis through his consulting firm, DNA Healthlink, Inc., through which the Company has contracted for his services, for a monthly cash fee of $12,500. Cash compensation expense pursuant to this agreement totaled $112,500 and $150,000 for the fiscal years ended December 31, 2020 and 2019, respectively, which is included in research and development expenses in the Company's consolidated statements of operations for such periods.

The Company entered into a consulting contract with David Dickason effective September 15, 2020 pursuant to which Mr. Dickason was appointed to and serves as the Company's Senior Vice President of Pre-Clinical Product Development on an at-will basis at the rate of $250 per hour.

Employment Agreements

Effective on May 6, 2020, Timothy Jones was appointed as RespireRx's President and Chief Executive Officer and entered into an employment agreement as of that date. In addition, Mr. Jones has continued to serve as a member of the Company's Board of Directors, a position he has held since January 28, 2020. On November 19, 2019, Mr. Jones became an advisor to the Company's Board of Directors, a position he held until January 27, 2020. Under the employment agreement, a provisional period of "at will" employment expired on July 31, 2020. Neither party terminated the employment agreement prior to July 31, 2020, and on that date all rights and obligations under the agreement were deemed effective, including with respect to the certain economic obligations of the Company upon termination of Mr. Jones' employment. The Board of Directors and Mr. Jones agreed to continue the employment agreement after the initial provisional period. The employment agreement has a termination date of September 30, 2023 and will automatically extend annually, upon the same terms and conditions, for successive periods of one year, unless either party provides written notice of its intention not to extend the term of the agreement at least 90 days prior to the applicable renewal date. On July 31, 2020, the employment agreement was amended. The terms of the amended agreement call for a base salary through September 30, 2020 of $300,000 per year which may remain accrued but unpaid at the discretion of the Board of Directors until such time as at least $2,500,000 has been raised. As of December 31, 2020, Mr. Jones base salary remained $300,000 per year. If $10,000,000 or more has been raised by September 30, 2021, Mr. Jones' base salary would be increased to $375,000 per year. Otherwise, it would remain at $300,000 annually unless increased pursuant to the employment agreement or by the Board of Directors. Mr. Jones' base salary is subject to cost of living increases. Mr. Jones was eligible for a guaranteed bonus of $200,000 on October 31,2020. Mr. Jones is also entitled to bonuses of $200,000 on March 31, 2021 and $150,000 each six months thereafter on each March 31st and September 30th thereafter, unless the agreement is earlier terminated. The guaranteed bonus of $200,000 that was due on October 31, 2020 was not paid and is accrued and payable as of that date. At the end of the provisional period, pursuant to the employment agreement, Mr. Jones was granted an option grant for the purchase of 1,000,000 shares of the Company's common stock upon the expiration of the provisional period which has since been adjusted to 100,000 shares after the reverse stock-split and is presented in the options tables in our consolidated financial statements as of December 31, 2020 on a post reverse stock-split basis. In addition, until such time as the Company establishes comparable benefits, Mr. Jones is entitled to $1,200 per month on a tax equalized basis for health insurance and $1,000 per month on a tax equalized basis for term life insurance plus a disability policy. Mr. Jones is entitled to be reimbursed for business expenses. Mr. Jones would be entitled to a $12,000 tax equalized annual automobile allowance after the Company has raised $10,000,000. In addition, on July 31, 2020, the Board of Directors granted Mr. Jones a discretionary bonus that was a grant of an option to purchase 16,000,000 shares of common stock expiring on July 31, 2025 at an exercise price equal to the closing price of the Company's common stock on July 31, 2020 of $0.0072 which has been adjusted to 1,600,000 shares and an exercise price of $0.072 after the reverse stock-split, and which is presented in the options tables in our consolidated financial statements as of December 31, 2020 on a post reverse stock-split basis, 25% of which vested immediately, 25% of which vested on September 30, 2020, December 31, 2020 and March 31, 2021. Upon commencement of Mr. Jones' employment agreement on May 6, 2020, Mr. Jones was no longer eligible to receive fees for his participation as a member of the Board of Directors. For the fiscal year ended December 31, 2020, the Company accrued $436,059 of compensation and related benefits for Mr. Jones in the form of Board of Directors advisory fees, salary and benefits and bonus, of which Mr. was paid $16,073 in cash and exchanged $28,218 of the accrued obligation for Series H Preferred Stock as discussed below. These amounts are included in accounts payable and accrued expenses and in accrued compensation in the Company's consolidated balance sheet as of December 31, 2020. On September 30, 2020, Mr. Jones, pursuant to an exchange agreement, forgave $28,218 of accrued Board of Directors and other fees owed to him in exchange for 28.218 shares of Series H Preferred Stock which, on the same day, was converted into 4,409,063 shares of Common Stock and a warrant to purchase 4,409,063 shares of Common Stock, both of which were adjusted to 440,906 shares of Common Stock and warrants respectively after the reverse stock-split and which are presented on a reverse stock-split basis in our consolidated financial statements as of December 31, 2020.

Effective May 6, 2020, with the appointment of Timothy Jones as RespireRx's President and Chief Executive Officer, Dr. Lippa resigned the interim officer positions of Interim Chief Executive Officer and Interim President, positions that Dr. Lippa had assumed on October 12, 2018 after the resignation of Dr. James Manuso on September 30, 2018. Dr. Lippa continues to serve as RespireRx's Executive Chairman and as a member of the Board of Directors as well as the Company's Chief Scientific Officer. Dr. Lippa has continued to serve as the Company's Executive Chairman and as a member of the Board of Directors. On August 18, 2015, Dr. Lippa was named Chief Scientific Officer of the Company, and the Company entered into an employment agreement with Dr. Lippa in that capacity. Pursuant to the agreement, which was for an initial term through September 30, 2018 (and which automatically extended on September 30, 2018, 2019 and 2020 and will automatically extend annually, upon the same terms and conditions, for successive periods of one year, unless either party provides written notice of its intention not to extend the term of the agreement at least 90 days prior to the applicable renewal date), Dr. Lippa earned an annual base salary of $300,000. Dr. Lippa is also eligible to earn a performance-based annual bonus award of up to 50% of his base salary, based upon the achievement of annual performance goals established by the Board of Directors in consultation with the executive prior to the start of such fiscal year, or any amount at the discretion of the Board of Directors. Additionally, Dr. Lippa has been granted stock options on several occasions and is eligible to receive additional awards under the Company's Plans at the discretion of the Board of Directors. Dr. Lippa did not receive any option to purchase shares of common stock during fiscal year ended December 31, 2020. Dr. Lippa is also entitled to receive, until such time as the Company establishes a group health plan for its employees, $1,200 per month, on a tax-equalized basis, as additional compensation to cover the cost of health coverage and up to $1,000 per month, on a tax-equalized basis, as reimbursement for a term life insurance policy and disability insurance policy. Dr. Lippa is also entitled to be reimbursed for business expenses. Additional information with respect to the stock options granted to Dr. Lippa is provided at Note 6 to the Company's consolidated financial

statements for the fiscal years ended December 31, 2020 and 2019. Cash compensation inclusive of employee benefits accrued pursuant to this agreement totaled $339,600 for each of the fiscal years ended December 31, 2020 and 2019, respectively, which amounts are included in accrued compensation and related expenses in the Company's consolidated balance sheet at December 31, 2020 and 2019, and in research and development expenses in the Company's consolidated statement of operations for the fiscal years ended December 31, 2020 and 2020. Dr. Lippa does not receive any additional compensation for serving as Executive Chairman and on the Board of Directors.

On March 22, 2020, July 13, 2020 and September 30, 2020, Dr. Lippa, forgave an aggregate of $853,000 of accrued compensation and benefits. On March 22, 2020, Dr, Lippa received 4,500,000 shares Common Stock for $153,000 of forgiven compensation, which shares of Common Stock were adjusted to 450,000 shares of Common Stock on a post reverse stock-split basis. On July 13, 2020, pursuant to an exchange agreement, Dr. Lippa forgave $600,000 of accrued compensation and benefits and in exchange received 600 shares of Series H Preferred Stock. On September 30, 2020, pursuant to an additional exchange agreement, Dr. Lippa forgave $100,000 of accrued compensation and benefits and in exchange received 100 shares of Series H Preferred Stock. Between July 13, 2020 and September 30, 2020, Dr. Lippa earned 2.6333333 shares of Series H Preferred Stock as dividends in-kind. On July 13, 2020 and September 30, 2020, Dr. Lippa contributed all of his Series H Preferred Stock to a family trust. On September 30, 2020, the family trust converted all of its Series H Preferred Stock into 109,786,458 shares of RespireRx Common Stock and a warrant to purchase 109,786,458 shares of Common Stock which were subsequently adjusted to 10,978,645 shares of Common Stock and warrants to purchase 10,978,645 shares of Common Stock.

On August 18, 2015, the Company also entered into an employment agreement with Jeff E. Margolis, in his role at that time as Vice President, Secretary and Treasurer. Pursuant to the agreement, which was for an initial term through September 30, 2016 and later amended (and which automatically extended on September 30, 2016, 2017, 2018 and 2019 and will automatically extend annually, upon the same terms and conditions for successive periods of one year, unless either party provides written notice of its intention not to extend the term of the agreement at least 90 days prior to the applicable renewal date), Mr. Margolis currently receives an annual base salary of $300,000, and is eligible to receive performance-based annual bonus awards based upon the achievement of annual performance goals established by the Board of Directors in consultation with the executive prior to the start of such fiscal year. Additionally, Mr. Margolis has granted stock options on several occasions and is eligible to receive additional awards under the Company's Plans at the discretion of the Board of Directors. Mr. Margolis is also entitled to receive, until such time as the Company establishes a group health plan for its employees, $1,200 per month, on a tax-equalized basis, as additional compensation to cover the cost of health coverage and up to $1,000 per month, on a tax-equalized basis, as reimbursement for a term life insurance policy and disability insurance policy. Mr. Margolis is also entitled to be reimbursed for business expenses. Additional information with respect to the stock options granted to Mr. Margolis is provided at Note 6 to the Company's consolidated financial statements for fiscal years ended December 31, 2020 and 2019. Recurring cash compensation accrued pursuant to this amended agreement totaled $321,600 for the fiscal year ended December 31, 2020 and 2019 which amounts are included in accrued compensation and related expenses in the Company's consolidated balance sheet December 31, 2020 and 2019, and in general and administrative expenses in the Company's consolidated statement of operations.

On March 22, 2020, July 13, 2020 and September 30, 2020, Mr. Margolis, forgave an aggregate of $803,000 of accrued compensation and benefits. On March 22, 2020, Mr. Margolis received 4,500,000 shares Common Stock for $153,000 of forgiven compensation, which shares of Common Stock were adjusted to 450,000 shares of Common Stock on a post reverse stock-split basis. On July 13, 2020, pursuant to an exchange agreement, Mr. Margolis forgave $500,000 of accrued compensation and benefits and in exchange received 500 shares of Series H Preferred Stock. On September 30, 2020, pursuant to an additional exchange agreement, Mr. Margolis forgave $150,000 of accrued compensation and benefits and in exchange received 150 shares of Series H Preferred Stock. Between July 13, 2020 and September 30, 2020, Mr. Margolis earned 2.194444 shares of Series H Preferred Stock as dividends in-kind. On July 13, 2020 and September 30, 2020, Mr. Margolis contributed all of his Series H Preferred Stock to three family trusts. On September 30, 2020, the family trusts converted all of their Series H Preferred Stock into 101,905,382 shares of RespireRx Common Stock and a warrant to purchase 101,905,382 shares of Common Stock which were subsequently adjusted to 10,190,538 shares of Common Stock and warrants to purchase 10,190,538 shares of Common Stock.

The employment agreements between the Company and Dr. Lippa, and Mr. Margolis (prior to the 2017 amendment), respectively, provided that the payment obligations associated with the first year base salary were to accrue, but no payments were to be made, until at least $2,000,000 of net proceeds from any offering or financing of debt or equity, or a combination thereof, was received by the Company, at which time scheduled payments were to commence. Dr. Lippa, and Mr. Margolis (who are each also directors of the Company) have each agreed, effective as of August 11, 2016, to continue to defer the payment of such amounts indefinitely, until such time as the Board of Directors of the Company determines that sufficient capital has been raised by the Company or is otherwise available to fund the Company's operations on an ongoing basis.

UWMRF Patent License Agreement

On August 1, 2020, RespireRx exercised its option pursuant to its option agreement dated March 2, 2020, between RespireRx and UWM Research Foundation, an affiliate of the University of Wisconsin-Milwaukee ("UWMRF"). Upon exercise RespireRx and UWMRF executed the UWMRF Patent License Agreement effective August 1, 2020 pursuant to which RespireRx licensed the identified intellectual property.

Under the UWMRF Patent License Agreement, the Company has an exclusive license to commercialize GABAkine products based on UWMRF's rights in certain patents and patent applications, and a non-exclusive license to commercialize products based on UWMRF's rights in certain technology that is not the subject of the patents or patent applications. UWMRF maintains the right to use, and, upon the approval of the Company, to license, these patent and technology rights for any non-commercial purpose, including research and education. The UWMRF Patent License Agreement expires upon the later of the expiration of the Company's payment obligations to UWMRF or the expiration of the last remaining licensed patent granted thereunder, subject to early termination upon the occurrence of certain events. The License Agreement also contains a standard indemnification provision in favor of UWMRF and confidentiality provisions obligating both parties.

Under the UWMRF Patent License Agreement, in consideration for the licenses granted, the Company will pay to UWMRF the following: (i) patent filing and prosecution costs incurred by UWMRF prior to the effective date, paid in yearly installments over three years from the Effective Date; (ii) annual maintenance fees, beginning on the second anniversary of the Effective Date, which annual maintenance fees terminate upon the Company's payment of royalties pursuant to clause (iv) below; (iii) milestone payments, paid upon the occurrence of certain dosing events of patients during clinical trials and certain approvals by the FDA; and (iv) royalties on net sales of products developed with the licenses, subject to minimum annual payments and to royalty rate adjustments based on whether separate royalty payments by the Company yield an aggregate rate beyond a stated threshold. The Company has also granted UWMRF certain stock appreciation rights with respect to the Company's neuromodulator programs, subject to certain limitations, and will pay to UWMRF certain percentages of revenues generated from sublicenses of the licenses provided under the UWMRF Patent License Agreement by the Company to third parties.

University of Illinois 2014 Exclusive License Agreement

On June 27, 2014, the Company entered into an Exclusive License Agreement (the "2014 License Agreement") with the University of Illinois, the material terms of which were similar to a License Agreement between the parties that had been previously terminated on March 21, 2013. The 2014 License Agreement became effective on September 18, 2014, upon the completion of certain conditions set forth in the 2014 License Agreement, including: (i) the payment by the Company of a $25,000 licensing fee, (ii) the payment by the Company of outstanding patent costs aggregating $15,840, and (iii) the assignment to the University of Illinois of rights the Company held in certain patent applications, all of which conditions were fulfilled.

The 2014 License Agreement granted the Company (i) exclusive rights to several issued and pending patents in numerous jurisdictions and (ii) the non-exclusive right to certain technical information that is generated by the University of Illinois in connection with certain clinical trials as specified in the 2014 License Agreement, all of which relate to the use of cannabinoids for the treatment of sleep related breathing disorders. The Company is developing dronabinol (Δ9-tetrahydrocannabinol), a cannabinoid, for the treatment of OSA, the most common form of sleep apnea.

The 2014 License Agreement provides for various commercialization and reporting requirements commencing on June 30, 2015. In addition, the 2014 License Agreement provides for various royalty payments, including a royalty on net sales of 4%, payment on sub-licensee revenues of 12.5%, and a minimum annual royalty beginning in 2015 of $100,000, which is due and payable on December 31 of each year beginning on December 31, 2015. The minimum annual royalty obligation of $100,000 due on December 31, 2020, was extended to April 19, 2021 and was paid in full on April 1, 2021. One-time milestone payments may become due based upon the achievement of certain development milestones. $350,000 will be due within five days after the dosing of the first patient is a Phase III human clinical trial anywhere in the world. $500,000 will be due within five days after the first NDA filing with FDA or a foreign equivalent. $1,000,000 will be due within twelve months of the first commercial sale. One-time royalty payments may also become due and payable. Annual royalty payments may also become due. In the year after the first application for market approval is submitted to the FDA or a foreign equivalent and until approval is obtained, the minimum annual royalty will increase to $150,000. In the year after the first market approval is obtained from the FDA or a foreign equivalent and until the first sale of a product, the minimum annual royalty will increase to $200,000. In the year after the first commercial sale of a product, the minimum annual royalty will increase to $250,000.

During the fiscal years ended December 31, 2020 and 2019, the Company recorded charges to operations of $100,000, respectively, with respect to its 2020 and 2019 minimum annual royalty obligation, which is included in research and development expenses in the Company's consolidated statement of operations for the fiscal years ended December 31, 2020 and 2019. The Company did not pay the amount due on December 31, 2020 for which the Company was granted an extension until April 19, 2021 and which was paid in full on April 1, 2021.

University of Alberta License Agreement

On May 18, 2018, the Company received a letter from counsel claiming to represent TEC Edmonton and The Governors of the University of Alberta, which purported to terminate, effective December 12, 2017, the license agreement dated May 9, 2007 (as subsequently amended) between the Company and The Governors of the University of Alberta. The Company, through its counsel, disputed any grounds for termination and notified the representative that it invoked Section 13 of that license agreement, which mandates a meeting to be attended by individuals with decision-making authority to attempt in good faith to negotiate a resolution to the dispute. In February 2019, the Company and TEC Edmonton tentatively agreed to terms acceptable to all parties to establish a new license agreement and the form of a new license agreement. However, after reaching that tentative agreement, the Company has re-evaluated that portion of its ampakine program and has decided not to enter into a new agreement at this time. The lack of entry into a new agreement at this time does not affect the Company's other ampakine programs and permits the Company to reallocate resources to those programs, including, but not limited to ADHD, FXS, SCI and CNS-driven Disorders.

Noramco Inc. - Dronabinol Development and Supply Agreement

On September 4, 2018, RespireRx entered into a dronabinol Development and Supply Agreement with Noramco Inc., one of the world's major dronabinol manufacturers. Under the terms of the Agreement, Noramco agreed to (i) provide all of the active pharmaceutical ingredient ("API") estimated to be needed for the clinical development process for both the first- and second-generation products (each a "Product" and collectively, the "Products"), three validation batches for New Drug Application ("NDA") filing(s) and adequate supply for the initial inventory stocking for the wholesale and retail channels, subject to certain limitations, (ii) maintain or file valid drug master files ("DMFs") with the FDA or any other regulatory authority and provide the Company with access or a right of reference letter entitling the Company to make continuing reference to the DMFs during the term of the agreement in connection with any regulatory filings made with the FDA by the Company, (iii) participate on a development committee, and (iv) make available its regulatory consultants, collaborate with any regulatory consulting firms engaged by the Company and participate in all FDA or Drug Enforcement Agency ("DEA") meetings as appropriate and as related to the API.

In consideration for these supplies and services, the Company has agreed to purchase exclusively from Noramco during the commercialization phase all API for its Products as defined in the Development and Supply Agreement at a pre-determined price subject to certain producer price adjustments and agreed to Noramco's participation in the economic success of the commercialized Product or Products up to the earlier of the achievement of a maximum dollar amount or the expiration of a period of time.

Transactions with Biovail Laboratories International SRL

Beginning in March 2010, the Company entered into a series of asset purchase and license agreements with Biovail Laboratories International SRL later merged with Valeant Pharmaceuticals International, Inc. which was later renamed Bausch Health Companies Inc. ("Biovail").

In March 2011, the Company entered into a new agreement with Biovail to reacquire the ampakine compounds, patents and rights that Biovail had acquired from the Company in March 2010. The new agreement provided for potential future payments of up to $15,150,000 by the Company based upon the achievement of certain developments, including new drug application submissions and approval milestones pertaining to an intravenous dosage form of the ampakine compounds for respiratory depression, a therapeutic area not currently pursued by the Company. Biovail is also eligible to receive additional payments of up to $15,000,000 from the Company based upon the Company's net sales of an intravenous dosage form of the compounds for respiratory depression.

At any time following the completion of Phase 1 clinical studies and prior to the end of Phase 2A clinical studies, Biovail retains an option to co-develop and co-market intravenous dosage forms of an ampakine compound as a treatment for respiratory depression and vaso-occlusive crises associated with sickle cell disease. In such an event, the Company would be reimbursed for certain development expenses to date and Biovail would share in all such future development costs with the Company. If Biovail makes the co-marketing election, the Company would owe no further milestone payments to Biovail and the Company would be eligible to receive a royalty on net sales of the compound by Biovail or its affiliates and licensees.

Summary of Principal Cash Obligations and Commitments

The following table sets forth the Company's principal cash obligations and commitments for the next five fiscal years as of December 31, 2020, aggregating $2,885,270. Employment agreement amounts included in the 2021 column represent amounts contractually due from January 1, 2021 through September 30, 2021 or in one case, September 30, 2023 when such contracts expire unless extended pursuant to the terms of the contracts.

		Payments Due By Year				
	Total	**2021**	**2022**	**2023**	**2024**	**2025**
License agreements	$ 560,370	$ 100,000	$115,092	$115,093	$130,185	$100,000
Employment agreements (1)	2,294,900	1,100,600	639,600	554,700	-	-
Total	$2,855,270	$1,200,600	$754,692	$669,793	$130,185	$100,000

(1) The payment of certain of such amounts has been deferred indefinitely, as described above in "Employment Agreements".

10. Subsequent Events

As of 5pm eastern time on January 5, 2021, the Company effected a ten to one (10:1) reverse stock split of its Common Stock by filing the Sixth Amendment of Second Restated Certificate of Incorporation of RespireRx Pharmaceuticals Inc. with the Secretary of State of the State of Delaware on January 4, 2021. The financial statements have been prepared as of December 31, 2020 and for the fiscal year then ended on a post-reverse stock split basis.

After a downgrade of the trading of our Common Stock to the OTC Pink Market on December 10, 2020, the reverse stock split described above occurred on January 5, 2021 and the Common Stock began trading on a post-reverse stock split basis on the OTC Markets OTC Pink Market from January 6, 2021 through Friday, February 5, 2021 while measuring for thirty calendar days, compliance with the uplisting requirements for listing on the OTC Markets OTCQB Venture Market. The stock was upgraded to the OTCQB Venture Market on Monday, February 8, 2021.

A purchase notice was sent to White Lion on February 19, 2021 was for 3,600,000 shares of Common Stock resulting in net proceeds after closing costs of $2,070 aggregating $115,229. The total of all shares sold pursuant to purchase notices (including three purchase notices in the fiscal year ended December 31, 2020 and the one February 19, 2021 purchase notice is 11,500,000 which is all of the shares registered and offered for sale is the registration statement on Form S-1 that became effective on October 29, 2020. There are no shares available for sale under that registration statement. In order for the Company to issue additional purchase notices to White Lion, the Company would either have to file a new registration statement or amend the current registration statement covering shares representing any remaining amounts available under the White Lion EPA, or up to $1,711,581.

The FirstFire Note dated July 2, 2020 was paid in full by conversion as follows:

Conversion Date	Principal Converted	Interest Converted	Costs paid by the Company by conversion	Conversion Price per Share	Shares of Common Stock Issued
January 19, 2021	$ 30,000	$ 0	$ 0	$ 0.02	1,500,000
February 4, 2021	$ 37,500	$ 0	$ 0	$ 0.02	1,875,000
February 16, 2021	$ 50,000	$ 0	$ 0	$ 0.02	2,500,000
March 3, 2021	$ 20,000	$ 6,875	$ 0	$ 0.02	1,343,750
Total	$ 137,500	$ 6,875	$ 0		7,218,750

The EMA Note dated July 30, 2020 was paid in full by conversion as follows:

Conversion Date	Principal Converted	Interest Converted	Costs paid by the Company by conversion	Conversion Price per Share	Shares of Common Stock Issued
February 4, 2021	$ 19,000	$ 0	$ 1,000	$ 0.02	1,000,000
February 10, 2021	$ 19,000	$ 0	$ 1,000	$ 0.02	1,000,000
February 12, 2021	$ 19,000	$ 0	$ 1,000	$ 0.02	1,000,000
March 3, 2021	$ 18,000	$ 4,136	$ 1,000	$ 0.02	1,156,807
Total	$ 75,000	$ 4,136	$ 4,000		4,156,807

On March 15, 2021, the White Lion Commitment Note was repaid in part by conversion as follows:

Conversion Date	Principal Converted	Interest Converted	Costs paid by the Company by conversion	Conversion Price per Share	Shares of Common Stock Issued
March 15, 2021	$ 25,000	$ 0	$ 0	$ 0.02	1,250,000

On February 17, 2021, the Company and FirstFire entered into a Securities Purchase Agreement (the "FirstFire Feb 2021 SPA") pursuant to which FirstFire provided a sum of $100,000 (the "FirstFire Feb 2021 Consideration") to the Company, in return for a convertible promissory note (the "FirstFire Feb 2021 Note") with a face amount of $112,000 (which difference in value as compared to the FirstFire Feb 2021 Consideration is due to an original issue discount of $12,000) and 2,000,000 commitment shares of Common Stock, a piggy-back registration rights agreement and other agreements and obligations. The net proceeds of the First Fire Feb 2021 Consideration, which were received by the Company on February 19, 2021, equal $97,500 after payment of $2,500 in FirstFire's legal fees. The FirstFire Feb 2021 Note bears interest at 10% per annum. The terms of the FirstFire Feb 2021 Note require that the Company reserve 18,060,000 shares of Common Stock or three times the number of shares into which the FirstFire Feb 2021 Note may convert, but no less than the initial number of shares of Common Stock that must be reserved.

On March 31, 2021, the Company and EMA entered into a Securities Purchase Agreement (the "EMA March 2021 SPA") pursuant to which EMA provided a sum of $100,000 (the "EMA March 2021 Consideration") to the Company, in return for a convertible promissory note (the "EMA March 2021 Note") with a face amount of $112,500 (which difference in value as compared to the EMA March 2021 Consideration is due to an original issue discount of $12,500) and a warrant exercisable for five years at $0.02 per share on a cash or cashless basis, into 2,400,000 shares of Common Stock, a piggy-back registration rights agreement and other agreements and obligations. The net proceeds of the EMA March 2021 Consideration, which were received by the Company on April 1, 2021, equal $96,750 after payment of $2,750 in EMA's legal fees. And $500 of EMA's due diligence fees. The EMA March 2021 Note bears interest at 10% per annum and matures on March 31, 2022. The EMA March 2021 Note is convertible at a fixed conversion price of $0.02 per share of Common Stock. The terms of the EMA March 2021 Note require that the Company reserve the greater of (i) 26,602,500 shares of Common Stock or (ii) three times the number of shares into which the EMA March 2021 Note may convert and into which the warrant may exercise.

RespireRx Pharmaceuticals Inc.
Annual Report on Form 10-K
Year Ended December 31, 2019
Exhibit Index

Exhibit Number	Description
2.1	Agreement and Plan of Merger, dated as of August 10, 2012, by and among Cortex Pharmaceuticals, Inc., Pier Acquisition Corp. and Pier Pharmaceuticals, Inc., incorporated by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K filed on August 16, 2012 (File no. 001-16467).
3.1	Second Restated Certificate of Incorporation dated May 19, 2010, incorporated by reference to the same numbered Exhibit to the Company's Current Report on Form 8-K filed May 24, 2010 (File no. 001-16467).
3.2	Certificate of Amendment of the (Second Restated) Certificate of Incorporation of Cortex Pharmaceuticals, Inc., incorporated by reference to Exhibit 3.2 to the Company's Current Report on Form 8-K filed on April 18, 2014 (File no. 001-16467).
3.3	Second Certificate of Amendment of the (Second Restated) Certificate of Incorporation of Cortex Pharmaceuticals, Inc., incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed December 17, 2015 (File no. 001-16467).
3.4	Third Certificate of Amendment of the Second Restated Certificate of Incorporation of RespireRx Pharmaceuticals Inc., incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed September 1, 2016 (File no. 001-16467).
3.5	By-Laws of the Company, as adopted March 4, 1987, and amended on October 8, 1996, incorporated by reference to Exhibit 3.2 to the Company's Annual Report on Form 10-KSB filed October 15, 1996 (File no. 001-17951).
3.6	Certificate of Amendment of By-Laws of the Company, incorporated by reference to Exhibit 3.5 to the Company's Report on Form 8-K filed November 15, 2007. (File no. 001-16467)
3.7	Certificate of Designation, Preferences, Rights and Limitations of Series G 1.5% Convertible Preferred Stock, incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed on March 24, 2014 (File no. 001-16467).
3.8	Fourth Certificate of Amendment of Second Restated Certificate of Incorporation of RespireRx Pharmaceuticals Inc. (incorporated by reference to Exhibit 3.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on May 6, 2020).
3.9	Certificate of Designation, Preferences, Rights and Limitations of Series H 2% Voting, Non-Participating, Convertible Preferred Stock (incorporated by reference to Exhibit 3.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on July 13, 2020).
3.10	Amendment to Certificate of Designation, Preferences, Rights and Limitations of Series H 2% Voting, Non-Participating, Convertible Preferred Stock (incorporated by reference to Exhibit 3.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on October 5, 2020).
3.11	Fifth Certificate of Amendment of the Second Restated Certificate of Incorporation of RespireRx Pharmaceuticals Inc. (incorporated by reference to Exhibit 3.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on November 25, 2020).
4.1	Placement Agency Agreement, dated August 24, 2007, by and between Cortex Pharmaceuticals, Inc. and JMP Securities LLC and Rodman and Renshaw, LLC, Form of Subscription Agreement and Form of Common Stock Purchase Warrant issued by Cortex Pharmaceuticals, Inc., incorporated by reference to Exhibits 1.1, 1.2 and 4.1, respectively, to the Company's Report on Form 8-K filed August 27, 2007 (File no. 001-16467).
4.2	Placement Agency Agreement, dated April 13, 2009, by and between the Company and Rodman & Renshaw, LLC, Form of Securities Purchase Agreement and Form of Common Stock Purchase Warrant issued by the Company, incorporated by reference to Exhibits 1.1, 1.2 and 4.1, respectively, to the Company's Current Report on Form 8-K filed April 17, 2009 (File no. 001-16467).
4.3	Description of Registrant's Securities

10.1†	Cortex Pharmaceuticals, Inc. 2006 Stock Incentive Plan, incorporated by reference to Exhibit 10.94 to the Company's Report on Form 8-K filed May 11, 2006 (File no. 001-16467).
10.2†	Form of Notice of Grant of Stock Options and Option Agreement under the Company's 2006 Stock Incentive Plan, incorporated by reference to Exhibit 10.96 to the Company's Quarterly Report on Form 10-Q filed August 8, 2006 (File no. 001-16467).
10.3†	Form of Incentive/Non-qualified Stock Option Agreement under the Company's 2006 Stock Incentive Plan, incorporated by reference to Exhibit 10.97 to the Company's Quarterly Report on Form 10-Q filed August 8, 2006 (File no. 001-16467).
10.4†	Amendment No. 1 to the Company's 2006 Stock Incentive Plan, dated May 9, 2007, incorporated by reference to Exhibit 10.101 to the Company's Current Report on Form 8-K filed May 15, 2007 (File no. 001-16467).
10.5†	Amendment No. 2 to the Company's 2006 Stock Incentive Plan, effective as of June 5, 2009, incorporated by reference Exhibit 10.115 to the Company's Quarterly Report on Form 10-Q filed August 14, 2009 (File no. 001-16467).
10.6†	Amendment No. 3 to the Company's 2006 Stock Incentive Plan, effective May 19, 2010, incorporated by reference to Exhibit 10.118 to the Company's Current Report on Form 8-K filed May 24, 2010 (File no. 001-16467).
10.7	Patent License Agreement between the Company and the University of Alberta, dated as of May 9, 2007, incorporated by reference to Exhibit 10.105 to the Company's Annual Report on Form 10-K filed March 17, 2008 (File no. 001-16467). (Portions of this Exhibit are omitted and were filed separately with the Secretary of the Commission pursuant to the Company's application requesting confidential treatment under Rule 24b-2 under the Securities Exchange Act of 1934).
10.8	Securities Purchase Agreement, dated July 29, 2009, by and between the Company and the Investors, including a form of Registration Rights Agreement attached as Exhibit B thereto and a form of Common Stock Purchase Warrant attached as Exhibit C thereto, incorporated by reference to Exhibit 10.114 to the Company's Current Report on Form 8-K filed July 30, 2009 (File no. 001-16467).
10.9	Asset Purchase Agreement, dated March 15, 2011, by and between the Company and Biovail Laboratories International SRL, incorporated by reference to Exhibit 10.122 to the Company's Quarterly Report on Form 10-Q filed May 23, 2011 (File no. 001-16467). (Portions of this exhibit are omitted and were filed separately with the Secretary of the Commission pursuant to the Company's application requesting confidential treatment under Rule 24b-2 of the Securities Exchange Act of 1934).
10.10	Patent Assignment and Option and Amended and Restated Agreement, dated June 10, 2011, between the Company and Les Laboratoires Servier, incorporated by reference to Exhibit 10.125 to the Company's Quarterly Report on Form 10-Q filed August 18, 2011 (File no. 001-16467). (Portions of this exhibit are omitted and were filed separately with the Secretary of the Commission pursuant to the Company's application requesting confidential treatment under Rule 24b-2 of the Securities Exchange Act of 1934.

10.11	Securities Purchase Agreement, dated January 15, 2010, by and between the Company and Samyang Optics Co., Ltd., including a form of Convertible Promissory Note attached as Exhibit A thereto and a form of Common Stock Purchase Warrant attached as Exhibit B thereto, incorporated by reference to Exhibit 10.116 to the Company's Current Report on Form 8-K filed January 21, 2010 (File no. 001-16467).
10.12	Securities Purchase Agreement, dated October 20, 2011, by and between the Company and Samyang Value Partners Co., Ltd., including the Common Stock Purchase Warrant attached as Exhibit A thereto, incorporated by reference to Exhibit 10.127 to the Company's Annual Report on Form 10-K filed March 30, 2012 (File no. 001-16467).
10.13	Securities Purchase Agreement, dated June 25, 2012, by and between the Company and Samyang Optics Co., Ltd., including a form of Secured Promissory Note attached as Exhibit A thereto, a form of Common Stock Purchase Warrant attached as Exhibit B thereto, and a form of Patent Security Agreement attached as Exhibit C thereto, incorporated by reference to Exhibit 10.129 to the Company's Quarterly Report on Form 10-Q filed on August 16, 2012 (File no. 001-16467).
10.14	Form of Securities Purchase Agreement, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on March 24, 2014 (File no. 001-16467).
10.15†	Cortex Pharmaceuticals, Inc. 2014 Equity, Equity-Linked and Equity Derivative Incentive Plan, established March 14, 2014, incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on March 24, 2014 (File no. 001-16467).
10.16	Exclusive License Agreement, dated as of June 27, 2014, by and between the Board of Trustees of the University of Illinois, a body corporate and politic of the State of Illinois, and Cortex Pharmaceuticals, Inc., incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on July 1, 2014 (File no. 001-16467).
10.17	Standard Agreement for Submitting Compounds for Preclinical Pharmacological, Pharmacokinetic and Toxicological Evaluation, dated October 19, 2015, by and between the National Institute on Drug Abuse (hereinafter referred to as "NIDA"), a component of the National Institutes of Health (NIH); and Cortex Pharmaceuticals, incorporated by reference to Exhibit 99.1 of the Company's Current Report on Form 8-K filed on January 19, 2016 (File no. 001-16467).
10.18†	Form of Non-Statutory Stock Option Award Agreement, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on July 23, 2014 (File no. 001-16467).
10.19†	Form of Incentive Stock Option Award Agreement, incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on July 23, 2014 (File no. 001-16467).
10.20†	Form of Restricted Stock Award Agreement, incorporated by reference to Exhibit 10.3 to the Company's Current Report on Form 8-K filed on July 23, 2014 (File no. 001-16467).
10.21	Release Agreement, dated September 2, 2014, between the Company and the Institute for the Study of Aging Inc., incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on September 5, 2014 (File no. 001-16467).
10.22	Form of Convertible Note and Warrant Agreement, including a form of 10% Convertible Note due September 15, 2012 attached as Exhibit A thereto and a Form of Warrant to Purchase Common Stock attached as Exhibit B thereto, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on November 12, 2014 (File no. 001-16467).
10.23	Demand Promissory Note, dated June 16, 2015, held by Arnold S. Lippa on behalf of the Company, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on June 19, 2015 (File no. 001-16467).
10.24	Form of Demand Promissory Note, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on February 3, 2016 (File no. 001-16467).
10.25	Form of Warrant to Purchase Common Stock, incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on February 3, 2016 (File no. 001-16467).

10.26†	2015 Stock and Stock Option Plan, dated June 30, 2015, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on July 8, 2015 (File no. 001-16467).
10.27†	Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on April 6, 2016 (File no. 001-16467).
10.28†	First Amendment of Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on January 23, 2017 (File no. 001-16467).
10.29†	Form of Non-Statutory Stock Option Award Agreement, incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on July 8, 2015 (File no. 001-16467).
10.30†	Employment Agreement, dated August 18, 2015, between the Company and James S. J. Manuso, incorporated by reference to Exhibit 10.2 to Form 8-K filed on August 19, 2015 (File no. 001-16467).
10.31†	Employment Agreement, dated August 18, 2015, between the Company and Arnold S. Lippa, incorporated by reference to Exhibit 10.3 to Form 8-K filed on August 19, 2015 (File no. 001-16467).
10.32†	Employment Agreement, dated August 18, 2015, between the Company and Robert N. Weingarten, incorporated by reference to Exhibit 10.4 to Form 8-K filed on August 19, 2015 (File no. 001-16467).
10.33†	Employment Agreement, dated August 18, 2015, between the Company and Jeff E. Margolis, incorporated by reference to Exhibit 10.5 to Form 8-K filed on August 19, 2015 (File no. 001-16467).
10.34	Form of Second Amended and Restated Common Stock and Warrant Purchase Agreement, including a Form of Warrant to Purchase Common Stock attached as Exhibit A thereto, incorporated by reference to Exhibit 10.1 to Form 8-K filed on August 31, 2015 (File no. 001-16467).
10.35	Form of Common Stock and Warrant Purchase Agreement, including a Form of Warrant to Purchase Common Stock attached as Exhibit A thereto, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on January 11, 2016 (File no. 001-16467).
10.36	Form of Common Stock and Warrant Purchase Agreement, including a Form of Warrant to Purchase Common Stock attached as Exhibit A thereto, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on January 5, 2017 (File no. 001-16467).
10.37	Form of Common Stock and Warrant Purchase Agreement, including a Form of Warrant to Purchase Common Stock attached as Exhibit A thereto, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on March 16, 2017 (File no. 001-16467).
10.38	Form of Exchange Agreement, including a Form of New Warrant attached as Exhibit A thereto, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on April 11, 2016 (File no. 001-16467).

10.39	Form of Exchange Agreement incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on April 11, 2016 (File no. 001-16467).
10.40	Form of Purchase Agreement (including a Form of Warrant) incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed on January 5, 2017 (File no. 001-16467)
10.41	Form of Purchase Agreement (including a Form of Warrant) incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed on April 3, 2017 (File no. 001-16467)
10.42†	Amendment No. One of the Employment Agreement of Jeff E. Margolis, effective July 1, 2017, incorporated by reference to Exhibit 10.1 of the Company's Quarterly Report on Form 10-Q filed on November 20, 2017 (File no. 001-16467)
10.43	Form of Purchase Agreement (including a Form of Warrant) incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed on August 30, 2017 (File no. 001-16467)
10.44	Form of Purchase Agreement (including a Form of Warrant) incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed on October 3, 2017 (File no. 001-16467)
10.45†	Second Amendment of the Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan incorporated by reference to Exhibit 10.3 of the Company's Current Report on Form 8-K filed on December 14, 2017 (File no. 001-16467)
10.46	Form of Demand Promissory Note incorporated by reference to Exhibit 99.1 to the Company's Current Report on Form 8-K filed on April 11, 2018.
10.47	Form of Note Exchange Agreement, incorporated by reference to Exhibit 99.1 to the Company's Current Report on Form 8-K filed on June 6, 2018.
10.48	Form of Purchase Agreement (including a Form of Warrant), incorporated by reference to the Company's Current Report on Form 8-K filed on September 12, 2018 (File no. 1-16467).
10.49	Development and Supply Agreement, dated September 4, 2018, between the Company and Noramco, Inc., incorporated by reference to Exhibit 10.1 of the Company's Quarterly Report on Form 10-Q filed on November 16, 2018.
10.50	Form of Convertible Promissory Note (including a Form of Warrant), incorporated by reference to the Company's Current Report on Form 8-K filed on December 17, 2018 (File no. 1-16467).
10.51	Form of Convertible Promissory Note (including the Form of Warrant), incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed March 5, 2019.
10.52	Securities Purchase Agreement, dated April 24, 2019, between RespireRx Pharmaceuticals Inc. and Power Up Lending Group Ltd., incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed April 30, 2019.
10.53	Convertible Promissory Note, dated April 24, 2019, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed April 30, 2019.
10.54	Securities Purchase Agreement, dated May 17, 2019, between RespireRx Pharmaceuticals Inc. and Crown Bridge Partners, LLC, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed May 23, 2019.
10.55	Convertible Promissory Note, dated May 17, 2019, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed May 23, 2019.
10.56	Common Stock Purchase Warrant, dated May 17, 2019, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed May 23, 2019.
10.57	Securities Purchase Agreement, dated August 19, 2019, between RespireRx Pharmaceuticals Inc. and FirstFire Global Opportunities Fund, LLC, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed August 27, 2019.
10.58	Convertible Promissory Note, dated August 19, 2019, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed August 27, 2019.

10.59	Common Stock Purchase Warrant, dated August 19, 2019, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed August 27, 2019.
10.60	Settlement Agreement and Release, dated August 21, 2019, between RespireRx Pharmaceuticals Inc. and Salamandra, LLC, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed August 27, 2019.
10.61	Securities Purchase Agreement, dated October 22, 2019, between RespireRx Pharmaceuticals Inc. and EMA Financial, LLC, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed October 28, 2019.
10.62	10% Convertible Note, dated October 22, 2019, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed October 28, 2019.
10.63	Common Stock Purchase Warrant, dated October 22, 2019, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed October 28, 2019.
10.64	Securities Purchase Agreement, dated November 4, 2019, between RespireRx Pharmaceuticals Inc. and Odyssey Funding, LLC, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed November 5, 2019.
10.65	RespireRx Pharmaceuticals Inc. 10% Convertible Redeemable Note due November 4, 2020, dated November 4, 2019, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed November 5, 2019.
10.66	First Amendment to Settlement Agreement and Release, dated as of December 16, 2019, between RespireRx Pharmaceuticals Inc. and Salamandra, LLC, incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed December 18, 2019.
10.67	Company Option Agreement, dated as of March 2, 2020, by and between the UWM Research Foundation, Inc. and RespireRx Pharmaceuticals Inc. (incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed March 4, 2020).
10.68	Form of Exchange Agreement (incorporated by reference to the Company's Current Report on Form 8-K (file no. 1-16467) filed March 26, 2020).
10.69	Securities Purchase Agreement, dated April 15, 2020, between RespireRx Pharmaceuticals Inc. and Power Up Lending Group Ltd. (incorporated by reference to Exhibit 99.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on April 21, 2020).
10.70	Convertible Promissory Note, dated April 15, 2020, in favor of Power Up Lending Group Ltd. (incorporated by reference to Exhibit 99.2 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on April 21, 2020).
10.71	Securities Purchase Agreement, dated June 7, 2020, between RespireRx Pharmaceuticals Inc. and Power Up Lending Group Ltd. (incorporated by reference to Exhibit 99.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on June 11, 2020).
10.72	Convertible Promissory Note, dated June 7, 2020, in favor of Power Up Lending Group Ltd. (incorporated by reference to Exhibit 99.2 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on June 11, 2020).
10.73†	Employment Agreement, dated May 6, 2020, between RespireRx Pharmaceuticals Inc. and Timothy Jones (incorporated by reference to Exhibit 99.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on May 6, 2020).
10.74†	Amendment No. 1 to Employment Agreement of Timothy Jones, effective July 31, 2020 (incorporated by reference to Exhibit 99.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on August 3, 2020).
10.75†	Fourth Amendment of Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan (incorporated by reference to Exhibit 99.7 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on May 6, 2020).
10.76†	Fifth Amendment of Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan (incorporated by reference to Exhibit 99.14 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on August 3, 2020).
10.77	Securities Purchase Agreement, dated July 2, 2020, between RespireRx Pharmaceuticals Inc. and FirstFire Global Opportunities Fund, LLC (incorporated by reference to Exhibit 99.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on July 7, 2020).

10.78	Convertible Promissory Note, dated July 2, 2020, in favor of FirstFire Global Opportunities Fund, LLC (incorporated by reference to Exhibit 99.2 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on July 7, 2020).
10.79	Common Stock Purchase Warrant, dated July 2, 2020, in favor of FirstFire Global Opportunities Fund, LLC (incorporated by reference to Exhibit 99.3 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on July 7, 2020).
10.80†	Exchange Agreement, dated July 13, 2020, between RespireRx Pharmaceuticals Inc. and Jeff Eliot Margolis (incorporated by reference to Exhibit 99.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on July 13, 2020).
10.81†	Exchange Agreement, dated July 13, 2020, between RespireRx Pharmaceuticals Inc. and Arnold S. Lippa (incorporated by reference to Exhibit 99.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on July 13, 2020).
10.82	Equity Purchase Agreement, dated July 28, 2020, between RespireRx Pharmaceuticals Inc. and White Lion Capital, LLC (incorporated by reference to Exhibit 99.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on August 3, 2020).
10.83	Registration Rights Agreement, dated July 28, 2020, between RespireRx Pharmaceuticals Inc. and White Lion Capital, LLC (incorporated by reference to Exhibit 99.2 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on August 3, 2020).
10.84	8% Fixed Promissory Note, dated July 28, 2020 in favor of White Lion Capital, LLC (incorporated by reference to Exhibit 99.3 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on August 3, 2020).
10.85	Amendment No. 1 to 8% Fixed Promissory Note in favor of White Lion Capital, LLC, dated September 30, 2020 (incorporated by reference to Exhibit 99.6 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on October 5, 2020).
10.86†	Amendment No. 1 to Employment Agreement of Timothy Jones, effective July 31, 2020 (incorporated by reference to Exhibit 99.5 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on August 3, 2020).
10.87†	Fifth Amendment of Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan (incorporated by reference to Exhibit 99.14 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on August 3, 2020).
10.88	Patent License Agreement, dated as of August 1, 2020, between RespireRx Pharmaceuticals Inc. and the University of Wisconsin-Milwaukee Research Foundation, Inc. (incorporated by reference to Exhibit 99.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on August 4, 2020).
10.89	Securities Purchase Agreement, dated July 30, 2020, between RespireRx Pharmaceuticals Inc. and EMA Financial, LLC (incorporated by reference to Exhibit 99.4 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on August 4, 2020).
10.90	10% Convertible Note, dated July 30, 2020, in favor of EMA Financial, LLC (incorporated by reference to Exhibit 99.5 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on August 4, 2020).
10.91	Common Stock Purchase Warrant, dated July 30, 2020, in favor of EMA Financial, LLC (incorporated by reference to Exhibit 99.6 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on August 4, 2020).
10.92†	Exchange Agreement, dated September 30, 2020, between RespireRx Pharmaceuticals Inc. and Timothy Jones (incorporated by reference to Exhibit 99.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on October 5, 2020).
10.93†	Exchange Agreement, dated September 30, 2020, between RespireRx Pharmaceuticals Inc. and Jeff Eliot Margolis (incorporated by reference to Exhibit 99.2 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on October 5, 2020).
10.94†	Exchange Agreement, dated September 30, 2020, between RespireRx Pharmaceuticals Inc. and Arnold S. Lippa (incorporated by reference to Exhibit 99.3 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on October 5, 2020).
10.95†	Exchange Agreement, dated September 30, 2020, between RespireRx Pharmaceuticals Inc. and Marc Radin PC (incorporated by reference to Exhibit 99.4 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on October 5, 2020).
10.96†	Exchange Agreement, dated September 30, 2020, between RespireRx Pharmaceuticals Inc. and Patent Network Law Group (incorporated by reference to Exhibit 99.5 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on October 5, 2020).

21**	Subsidiaries of the Registrant.
23.1**	Consent of Haskell & White LLP, Independent Registered Public Accounting Firm.
24**	Power of Attorney (included as part of the signature page of this Annual Report on Form 10-K).
31.1**	Certification of Chief Executive Officer Pursuant to Rule 13a-14(a)/15d-14(a) of the Securities Exchange Act of 1934.
31.2**	Certification of Chief Financial Officer Pursuant to Rule 13a-14(a)/15d-14(a) of the Securities Exchange Act of 1934.
32**	Certification of Chief Executive Officer and Chief Financial Officer Pursuant to Rule 13a-14(b)/15d-14(b) of the Securities Exchange Act of 1934 and 18 U.S.C. Section 1350.
101.INS**	XBRL Instance Document.
101.SCH**	XBRL Taxonomy Extension Schema Document.
101.CAL**	XBRL Taxonomy Extension Calculation Linkbase Document†
101.DEF**	XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB**	XBRL Taxonomy Extension Label Linkbase Document.
101.PRE**	XBRL Taxonomy Extension Presentation Linkbase Document.

† Each of these Exhibits constitutes a management contract, compensatory plan or arrangement.
**Filed herewith.

Signatures

Pursuant to the requirements of Section 13 or 15(d) 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.

RESPIRERX PHARMACEUTICALS INC.

Date: April 15, 2021

By: */s/ Timothy L. Jones*
Timothy L. Jones
President, Chief Executive Officer, and Director

We, the undersigned directors and officers of RespireRx Pharmaceuticals Inc., do hereby constitute and appoint each of Timothy L. Jones., and Jeff E. Margolis as our true and lawful attorneys-in-fact and agents with power of substitution, to do any and all acts and things in our name and behalf in our capacities as directors and officers and to execute any and all instruments for us and in our names in the capacities indicated below, which said attorneys-in-fact and agents, or either of them, may deem necessary or advisable to enable said corporation to comply with the Securities and Exchange Act of 1934, as amended, and any rules, regulations and requirements of the Securities and Exchange Commission, in connection with this Annual Report on Form 10-K, including specifically but without limitation, power and authority to sign for us or any of us in our names in the capacities indicated below, any and all amendments hereto; and we do hereby ratify and confirm all that said attorney-in-fact and agent, shall do or cause to be done by virtue hereof.

In accordance with 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.

Signature	Title	Date
/s/ Timothy Jones Timothy Jones	President, Chief Executive Officer and Director	April 15, 2021
/s/ Jeff E. Margolis Jeff E. Margolis	Senior Vice President, Chief Financial Officer, Treasurer, Secretary, and Director	April 15, 2021
/s/ Arnold S. Lippa, Ph.D. Arnold S. Lippa, Ph.D.	Chief Scientific Officer and Executive Chairman of the Board	April 15, 2021
/s/ Kathryn MacFarlane Kathryn MacFarlane	Director	April 15, 2021

Exhibit 4.3

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

The following is a general description of the common stock of RespireRx Pharmaceuticals Inc. (the "Company") and does not purport to be complete. For a complete description of the terms and provisions of the common stock, refer to the Company's Second Restated Certificate of Incorporation, as amended to date (the "Certificate of Incorporation") and By-Laws of the Company, as amended (the "Bylaws"), each of which is an exhibit incorporated by reference into the Annual Report on Form 10-K of which this exhibit is a part. This summary is qualified in its entirety by reference to these documents.

Authorized and Outstanding Capital Stock

The Company is authorized to issue a total of 2,005,000,000 shares of capital stock, with a par value of $0.001 per share. Of the authorized amount, 2,000,000,000 of the shares are designated as Common Stock and 5,000,000 of the shares are designated as preferred stock.

As of December 31, 2020, there were 71,271,095 shares of common stock issued and outstanding.

Description of Common Stock

General. Each share of the Company's Common Stock has the same rights and privileges. Holders of the common stock do not have any preferences or any preemptive, redemption, subscription, conversion or exchange rights. All outstanding shares of common stock are fully paid and non-assessable. The Company's Common Stock is quoted on the OTCQB, under the symbol "RSPI."

Voting Rights. The holders of Common Stock are entitled to vote upon all matters submitted to a vote of stockholders and are entitled to one vote for each share of Common Stock held. There is no cumulative voting.

Dividends. The Company has never paid cash dividends on its Common Stock and does not anticipate paying such dividends in the foreseeable future. The payment of dividends, if any, will be determined by the Board in light of conditions then existing and may be paid on the Common Stock subject to the prior rights and preferences, if any, applicable to shares of preferred stock or any series of preferred stock, when and if declared by the Board, out of funds legally available therefor.

Liquidation and Distribution. If the Company voluntarily or involuntarily liquidates, dissolves or winds-up, or upon any distribution of assets, the holders of Common Stock will be entitled to receive, after distribution in full of the preferential amounts, if any, to be distributed to the holders of preferred stock or any series of preferred stock, all of the remaining assets available for distribution equally and ratably in proportion to the number of shares of Common Stock held by them.

Material Limitation or Qualification of Rights of Common Stock

Preferred Stock, Generally. The Company may issue preferred stock with such powers, preferences, rights, qualifications, limitations, and restrictions as the Board may, without prior stockholder approval, establish. The existence, and potential future issuance, of shares of preferred stock by the Company could result in substantial dilution of the economic and governance rights of holders of the Company's common stock.

As of December 31, 2020, the Company's authorized shares of preferred stock are designated into series as follows: 3,000 shares of Series H 2% Voting, Non-Participating Convertible Preferred Stock, 37,500 shares as Series B Convertible Preferred Stock ("Series B Preferred Stock"), 1,700 shares as Series G 1.5% Convertible Preferred Stock ("Series G Preferred Stock"), 1,250,000 shares as 9% Cumulative Convertible Preferred Stock ("9% Preferred Stock"), 205,000 shares as Series A Junior Participating Preferred Stock ("Series A Preferred Stock"), and 3,505,800 shares are undesignated and may be issued with such rights and powers as the Board may designate.

Series H Preferred Stock. As of December 31, 2020, there were no shares of Series H Preferred Stock are issued and outstanding or accrued as dividends as all outstanding shares of Series H Preferred Stock inclusive of accrued dividends converted into units that resulted in the issuance of 25,377,426 shares of Common Stock and warrants to purchase 25,377,426 shares of Common Stock. Each share of Series H Preferred Stock is convertible into 15,625 units at an effective conversion price of $0.064 per unit, with each unit comprising one share of Common Stock and one warrant exercisable for one share of Common Stock. Each share of Series H Preferred Stock entitles the holder to that number of votes equal to two times the number of shares of Common Stock into which it is convertible. In the event of any liquidation or winding up of the Company prior to and in preference to any junior securities, the holders of the Series H Preferred Stock will be entitled to receive in preference to the holders of any junior securities a per share amount equal to the $0.001, plus any accrued and unpaid dividends.

Series B Preferred Stock. As of December 31, 2020, 37,500 shares of Series B Preferred Stock are issued and outstanding. Each share of Series B Preferred Stock is convertible into approximately 0.000030 shares of common stock at an effective conversion price of $22,083.75 per share of common stock, which is subject to adjustment under certain circumstances. As of December 31, 2020, the shares of Series B Preferred Stock outstanding are convertible into 1 share of Common Stock. Shares of Series B Preferred Stock do not entitle the holder to voting rights. The Company may redeem the Series B Preferred Stock for $25,001, equivalent to $0.6667 per share, an amount equal to the liquidation preference, at any time upon 30 days prior notice.

Series G Preferred Stock. As of December 31, 2020, no shares of Series G Preferred Stock are issued and outstanding. If issued, each share of Series G Preferred Stock is convertible into that number of shares of Common Stock determined by dividing $1,000 by an initial conversion price of $0.033. The conversion price with respect to a share of Series G Preferred Stock is subject to adjustment upon certain events that occur while such share is outstanding, pursuant to Section 7 of the Certificate of Designation for the Series G Preferred Stock (see Exhibit 3.7 to the Company's Annual Report on Form 10-K of which this exhibit is a part). As of December 31, 2020, the conversion price with respect to Series G Preferred Stock is not subject to adjustment because no shares of Series G Preferred Stock are outstanding. If issued, each outstanding share of Series G Preferred Stock, prior to the date such share is eligible for conversion, entitles the holder to 30,303 votes per share (which may be subject to adjustment as described above), and thereafter, each share entitles the holder to voting rights on an as-converted basis.

9% Preferred Stock. As of December 31, 2020, no shares of 9% Preferred Stock are issued and outstanding. If issued, each share of 9% Preferred Stock is convertible into shares of common stock according to a conversion rate subject to adjustment upon the occurrence of certain events, including a reverse stock split, as set forth under the Certificate of Incorporation (see Exhibit 3.1 to the Company's Annual Report on Form 10-K of which this exhibit is a part). Thereunder, each share of 9% Preferred Stock is convertible into that number of shares of common stock determined by dividing $1.00 by a conversion rate of $1.50, subject to adjustment pursuant to the reverse stock splits effected by the Company on September 1, 2016 and January 5, 2021, whereby, on September 1, 2016 each 325 shares of Common Stock was exchanged and combined into one share of Common Stock and on January 5, 2021, each 10 shares of Common Stock was exchanged and combined into one share of Common Stock. Shares of 9% Preferred Stock do not entitle the holder to voting rights.

Series A Preferred Stock. As of December 31, 2020, no shares of Series A Preferred Stock are issued and outstanding. Shares of Series A Preferred Stock do not entitle the holder to voting rights, except to the extent the holder would be entitled to vote with the holders of Common Stock as set forth in the Certificate of Designation for the Series A Preferred Stock (see Exhibit 3.1 to the Company's Annual Report on Form 10-K of which this exhibit is a part).

Anti-Takeover Provisions in the Certificate of Incorporation and Bylaws

Certain provisions of our Certificate of Incorporation and Bylaws summarized below may delay, defer or prevent a tender offer or takeover attempt, including attempts that might result in a premium over the market price for the Company's securities.

Our Certificate of Incorporation and Bylaws provide: (i) that the Company may issue preferred stock with such powers, preferences, rights, qualifications, limitations, and restrictions as the Board may, without prior stockholder approval, establish, as described above; and (ii) that special meetings of stockholders may only be called by the chairman of the Board, the president, the secretary, a majority of the members of the Board or the holders of a majority of the shares of Common Stock then outstanding.

EXHIBIT 21

Subsidiaries of the Registrant

Pier Pharmaceuticals, Inc. incorporated in the state of Delaware

EXHIBIT 23.1

CONSENT OF INDEPENDENT R EGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the Registration Statements on Form S-8 (No. 333-248816, No. 333-211441 and No. 333-208017) of RespireRx Pharmaceuticals Inc. (the "Company") of our report dated April 15, 2021 relating to our audit of the Company's consolidated financial statements as of December 31, 2020 and 2019, and for each of the years then ended, included in the Company's Annual Report on Form 10-K for the year ended December 31, 2020.

Our report dated April 15, 2021 contains an explanatory paragraph that states the Company does not have sufficient working capital to fund its operations and commitments. These conditions raise substantial doubt about the Company's ability to continue as a going concern. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

HASKELL & WHITE LLP

Irvine, California
April 15, 2021

EXHIBIT 31.1

CERTIFICATION

I, Timothy Jones certify that:

1. I have reviewed this annual report on Form 10-K of RespireRx Pharmaceuticals 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(s) 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, including its consolidated subsidiaries, 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(s) 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 the 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.

Date: April 15, 2021

/s/ Timothy Jones

Timothy Jones
President, Chief Executive Officer and Director

EXHIBIT 31.2

CERTIFICATION

I, Jeff E. Margolis, certify that:

1. I have reviewed this annual report on Form 10-K of RespireRx Pharmaceuticals 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(s) 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, including its consolidated subsidiaries, 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(s) 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 the 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.

Date: April 15, 2021

/s/ Jeff E. Margolis

Jeff E. Margolis
Senior Vice President, Chief Financial Officer, Treasurer and Secretary

EXHIBIT 32

CERTIFICATION

Timothy Jone, President, Chief Executive Officer and Director of RespireRx Pharmaceuticals Inc. (the "Company"), and Jeff E. Margolis, Senior Vice President, Chief Financial Officer, Treasurer, Secretary and Director of the Company, each hereby certifies, pursuant to Rule 13a-14(b) or Rule 15d-14(b) of the Securities Exchange Act of 1934, 18 U.S.C. Section 1350, that:

(1) the Annual Report on Form 10-K of the Company for the year ended December 31, 2020 (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: April 15, 2021

/s/ Timothy Jones

Timothy Jones
President, Chief Executive Officer and Director

Dated: April 15, 2021

/s/ Jeff E. Margolis

Jeff E. Margolis
Senior Vice President, Chief Financial Officer, Treasurer, Secretary and Director

This certification accompanies the Annual Report pursuant to Rule 13a-14(b) or Rule 15d-14(b) under the Securities Exchange Act of 1934 and 18 U.S.C. Section 1350 and shall not be deemed filed by the Company for purposes of Section 18 of the Securities Exchange Act of 1934.