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, 2019

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 if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. [ ]

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

Large accelerated filer [ ]	Accelerated filer [ ]	Non-accelerated filer [ ]	Smaller reporting company [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 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 28, 2019 was approximately $2,381,809 (based on the closing sale price of the common stock as reported by the OTC QB) on June 28, 2019.

As of April 9, 2020, there were 33,693,853 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. (f/k/a Cortex 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" or the "Company" or "we") contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934 (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 "anticipates," "believes," "intends," "estimates," "expects," "plans," "contemplates," "targets," "continues," "budgets," "may," and similar expressions 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 proposed products, (iv) reorganization plans, and (v) the need for, and availability of, additional financing.

The forward-looking statements included herein are based on current expectations that involve a number of risks and uncertainties. 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 the Company believes that the assumptions underlying the forward-looking statements are reasonable, actual results may differ materially from those set forth in the forward-looking statements. In light of the significant uncertainties inherent in the forward-looking information included herein, the inclusion of such information should not be regarded as a representation by the Company or any other person that the Company's objectives or plans will be achieved.

Factors that could cause or contribute to such differences include, but are not limited to, regulatory policies or changes thereto, available cash, research and development results, competition from other similar businesses, interest of third parties in collaborations with us, and market and general economic factors.

For more information about the risks and uncertainties the Company faces, see "Item 1A. Risk Factors" of this Annual Report on Form 10-K. 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.

PART I

Item 1. 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 obstructive sleep apnea ("OSA"), attention deficit hyperactivity disorder ("ADHD") and recovery from spinal cord injury ("SCI"), as well as certain neurological orphan diseases such as Fragile X Syndrome. RespireRx is developing a pipeline of new drug products based on our broad patent portfolios across two distinct drug platforms:

(i) cannabinoids, including dronabinol (a synthetic form of Δ9-THC (or Dronabinol) as defined below) that act upon the nervous system's endogenous cannabinoid receptors, and

(ii) (ii) neuromodulators, which we now call Project Endeavor, including (a) ampakines, proprietary compounds that positively modulate AMPA-type glutamate receptors to promote neuronal function and (b) positive allosteric modulators ("PAMs") of the gamma-amino-butyric acid type A ("GABA-A") receptors that are the subject of an option agreement dated March 2, 2020 between the Company and the UWM Research Foundation, Inc. ("UWMRF"), an affiliate of the University of Wisconsin-Milwaukee.

I. *Cannabinoids*

Background

Cannabinoids is a broad term to describe the pharmacologically active naturally occurring substances found within the cannabis (marijuana) plant. While the liberalization of state laws regulating the use and sales of marijuana has created a major industry based on the commercialization of marijuana for both medical and recreational use, the U.S. Food and Drug Administration ("FDA") has not recognized or approved the marijuana plant as medicine nor is it federally legal to sell products that contain cannabinoids as drugs, dietary supplements or foods (edibles) without its approval. From a scientific and pharmaceutical perspective, however, we do not think that pharmaceutical cannabinoids should suffer from the stigma that marijuana has, since it was declared a controlled substance in the 1930's. We believe that cannabinoids should be considered pharmaceuticals developed under FDA and comparable international regulatory bodies that happen to have been originally derived from plants much like aspirin, theophylline or tamoxifen.

In parallel with the widespread public attention given to the growth of the recreational, dietary supplement, health and wellness and medical cannabis industry, an alternate approach has focused on the development of cannabinoids as pharmaceutical products. We refer to the term "pharmaceutical cannabinoids" as cannabinoids developed according to FDA accepted regulatory pathways by which a company receives FDA approval to market and sell any new drug. Scientific study has focused on the two major cannabinoids, Δ9-tetrahydrocannabinol ("Δ9-THC") and cannabidiol ("CBD"), although additional cannabinoids are gaining attention. RespireRx has been one of the pioneers in the field of pharmaceutical cannabinoids with its long-term commitment to developing Δ9-THC for the treatment of sleep-related breathing disorders.

To date, the FDA has approved three cannabinoids: (1) dronabinol (Marinol® and its generic equivalent and Syndros®), synthetically manufactured Δ9-THC, approved for the treatment of AIDS-related anorexia and chemotherapy induced nausea and vomiting, (2) Epidiolex®, an oral formulation of plant-derived, purified CBD, approved for seizures associated with Lennox-Gastaut syndrome or Dravet syndrome, and (3) nabilone (Cesamet®), a synthetic analogue of tetrahydrocannabinol, approved for chemotherapy induced nausea and vomiting. Sativex®, an oral solution containing a complex botanical mixture of tetrahydrocannabinol and CBD for the treatment of spasticity due to multiple sclerosis, is sold in Europe and over 23 other countries, but is not approved in the U.S. Management believes that the commercialization of these pharmaceutical cannabinoids has opened the door to a potentially large, expanding pharmaceutical cannabinoid market opportunity.

Dronabinol is a synthetically manufactured Δ9-THC, one of the pharmacologically active substances naturally occurring in the cannabis plant. Dronabinol, in its soft gel cap formulation, is a Schedule III, controlled drug that has been approved by the FDA for the treatment of AIDS-related anorexia and chemotherapy-induced nausea and vomiting. Dronabinol is available in the United States as the branded prescription drug product Marinol® capsules. Marinol®, together with numerous generic formulations, is available in 2.5, 5, and 10 mg capsules, with a maximum labelled dosage of 20 mg/day for the AIDS indication, or 15 mg/m2 per dose for chemotherapy-induced nausea and vomiting. Syndros® is a liquid formulation of dronabinol and is a Schedule II, controlled drug.

OSA and Existing Treatments

RespireRx has sought to capitalize upon this opportunity by emphasizing its development of dronabinol for the treatment of obstructive sleep apnea ("OSA"). OSA is 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 ("ERS") 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 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 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. We believe that a new drug therapy that is effective in reducing the medical and economic burden of OSA would have significant advantages for optimal pricing in 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. CPAP is not curative, and patients must use the mask 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 hyponea 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 including the Mandibular Advancement Device ("MAD") and the Tongue Retaining Device ("TRD"). The MAD is the most widely used dental device for sleep apnea and is similar in appearance to a sports mouth guard. It forces the lower jaw forward and down slightly which keeps the airway more open. The TRD is a splint that holds the tongue in place to keep the airway as open as possible. Like CPAP, oral devices are not curative for patients with OSA. The cost of these devices tends to be high and side effects associated with them include nighttime pain, dry lips, tooth discomfort, and excessive salivation.

Patients with clinically significant OSA who cannot be treated adequately with CPAP or oral devices can elect to undergo surgery. The most common surgery is uvulopalatopharyngoplasty which involves the removal of excess tissue in the throat to make the airway wider. Other possible surgeries include tracheostomies, rebuilding of the lower jaw, and nose surgery. Patients who undergo surgery for the treatment of OSA risk complications, including infection, changes in voice frequency, and impaired sense of smell. Surgery is often unsuccesful and, at present, no method exists to reliably predict therapeutic outcome from these forms of OSA surgery.

Recently, another surgical option has become available based on upper airway stimulation. It is a combination of an implantable nerve stimulator and an external remote controlled by the patient. The hypoglossal nerve is a motor nerve that controls the tongue. The implanted device stimulates the nerve with every attempted breath, regardless of whether such stimulation is needed for that breath, to increase muscle tone to prevent the tongue and other soft tissues from collapsing. The surgically implanted device is turned on at night and off in the morning by the patient with the remote.

The Company's Cannabinoid 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 the University of Illinois Chicago (the "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 Company is required under the 2014 License Agreement, among other terms and conditions, to pay UIC a license fee, royalties, patent costs and certain milestone payments.

The 2014 License Agreement obligates the Company to comply with various commercialization and reporting requirements that commenced in 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, 2019, was extended to June 30, 2020. 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 the 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. For each of the years ended December 31, 2019 and 2018, the Company recorded a charge to operations of $100,000 with respect to its minimum annual royalty obligation, which is included in research and development expenses in the Company's consolidated statements of operations for the years ended December 31, 2019 and 2018, respectively.

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

The poor tolerance and long-term adherence to CPAP, as well as the limitations of mechanical devices and surgery, make discovery of therapeutic alternatives clinically relevant and important. RespireRx's translational research results demonstrate that dronabinol has the potential to become the first drug treatment for this large and underserved market.

The Company conducted a 21-day, randomized, double-blind, placebo-controlled, dose escalation Phase 2A clinical study in 22 patients with OSA, in which 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 allowing for the submission of patent applications claiming unique dosage strengths and controlled release formulations optimized for use in the treatment of OSA. If approved, these pending patents would extend market exclusivity until at least 2031.

With approximately $5 million in funding from the National Heart, Lung and Blood Institute of National Institutes of Health ("NIH"), Dr. David Carley of UIC, along with his colleagues at UIC and Northwestern University, completed a Phase 2B multi-center, double-blind, placebo-controlled clinical trial of dronabinol in patients with OSA. This study, named "Pharmacotherapy of Apnea with Cannabimimetic Enhancement" ("PACE") replicated the earlier Phase 2A study. The authors reported that, in a dose-dependent fashion, treatment with 2.5mg and 10mg of dronabinol once a 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 10mg of dronabinol significantly improved daytime sleepiness as measured by the Epworth Sleepiness Scale and achieved the greatest overall patient satisfaction. As in the 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 or fund this clinical trial which was funded by the National Heart, Lung and Blood Institute of NIH.

We initially believed that the most direct route to commercialization was to proceed directly to a Phase 3 pivotal clinical trial using the currently available, FDA approved (for other indications), generically available dronabinol gel cap formulation and to commercialize, within the present RespireRx public corporate structure, a RespireRx branded dronabinol capsule under a 505(b)(2) FDA regulatory pathway in the US. (see "Proposed Regulatory Process" below). We planned to follow this product with a proprietary formulation. However, several recent developments have caused us to re-evaluate this approach and to consider accelerating the development of a new proprietary formulation, as well as implementing an internal restructuring plan that contemplates spinning out the cannabinoid platform into what initially would be a wholly-owned subsidiary of RespireRx ("Newco", official name not yet determined) for the purpose of developing pharmaceutical cannabinoids. Newco's initial primary focus will be the re-purposing of dronabinol for the treatment of OSA, using a new proprietary formulation.

Newco

We are considering the formation of Newco for reasons described below, among others.

- Prospective Management

We have identified and are in discussions with an individual highly experienced in the cannabinoid industry to potentially serve as the chief executive officer of Newco, as well as key opinion leaders to sit on Newco's scientific advisory board ("SAB"). However, we cannot provide assurance that this individual or the SAB candidates will join us.

- Business Plan

A detailed business plan with *pro forma* budgets has been prepared, which describes our strategy and plans for developing and commercializing the dronabinol platform for the treatment of OSA, including a review of the market opportunity, clinical development and regulatory pathway.

- Key contracts

A joint development and supply agreement that is in place with Purisys LLC ("Purisys"), a subsidiary of Noramco, Inc., a leading dronabinol manufacturer and our license with UIC, will need to be transferred or otherwise made available to Newco. While Newco's initial, primary focus will be on re-purposing dronabinol for the treatment of OSA, we believe that our broad enabling patents and a new proprietary formulation may provide a framework for expanding into the larger burgeoning pharmaceutical cannabinoid industry. We believe that by creating Newco, it may be possible, through separate finance channels and potential strategic transactions, to optimize the asset value not only of the cannabinoid platform, but our neuromodulation platform as well.

- Prospective Investors

Within the last 15 months, members of senior management of RespireRx have accepted invitations to be major speakers at several international pharmaceutical cannabinoid conferences. Due to the COVID-19 (SARS-CoV-2) pandemic, these conferences have been rescheduled and senior management intends to speak at such events once rescheduled. We have had discussions with a number of potential cannabinoid investors and strategic partners who have expressed interest, mostly in the development of a new, proprietary formulation with extended patent life, with essentially no interest in our neuromodulator platform. Our assessment is that such potential investors or strategic partners, while apparently willing to accept the risks of a cannabinoid platform, are not interested in subjecting their cannabinoid investment or efforts to the risks of the neuromodulator platform. Alternatively, other potential investors and strategic partners might be interested in the neuromodulators independent of the cannabinoid platform.

- Intellectual Property

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, as well as a new U.S. provisional patent application further disclosing novel dosage and controlled release compositions and methods of use for cannabinoids, alone or in combination, including with 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. As previously disclosed, the original patents were filed by RespireRx and are now included in an exclusive license agreement with UIC. 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 at least 2031.

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 is headed in the direction of enhanced absorption and controlled release. These technologies, 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. New cannabinoid formulation technology is headed in the direction of enhanced absorption and controlled release. We believe that our pending patent priority relating back to 2010 predates the efforts of others seeking to develop low-dose or extended release formulations of cannabinoids. Thus, to the extent that new technologies result in lower doses and/or controlled release formulations, we believe they would infringe on our pending patents once issued, not only for use in the treatment of OSA but potentially a wide variety of other indications as well. For these reasons, we believe our new and continuing intellectual property initiatives may afford expanding strategic options and market exclusivity in the burgeoning pharmaceutical cannabinoid business sector.

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. Within the past 6 to 12 months, new formulation technology has emerged potentially allowing for the creation of a proprietary dronabinol formulation with optimized dose and duration of action for treating OSA. We have discussions in progress with a number of companies that have existing cannabinoid formulation technologies, expertise, and licensure capabilities, which may lead to the development of a proprietary formulation of dronabinol for RespireRx based on RespireRx's pending patents for low-dose and extended release dronabinol and may lead to the development of a marketable proprietary formulation of dronabinol. We 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 currently available generic soft gel capsules, but would dramatically extend market exclusivity; however, no assurance can be provided that any of the formulation technologies that we are currently analyzing will result in viable products or that formulation agreements will be consummated on terms acceptable to us, if successful. The failure to consummate a formulation agreement would materially and adversely affect the Company.

- The Opportunity to Improve Dronabinol Formulations

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

a. Dronabinol exhibits poor and erratic absorption. Δ9-THC is not water soluble. The market dominant commercial gel cap 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 Schedule II as compared to the capsule that is Schedule III.

b. 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.

c. 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 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 (see below for details). 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 anticipate 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.

- 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) recently has announced the implementation of a program to diagnose and treat OSA initially within their own in-store, walk-in MinuteClinics. If implemented throughout their HealthHUB store network, the number of people diagnosed with sleep apnea and eligible for treatment should increase dramatically. Fitbit (NYSE: FIT), the 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 U.S. 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.

As noted below in “Proposed Regulatory Process,” there are several ways to achieve market exclusivity with respect to this large and underserved patient population.

- Proposed Regulatory Process

The use of dronabinol for the treatment of OSA is a novel indication for an already approved drug and, as such, the Company believes that it would allow us or a development partner to submit a 505(b)(2) New Drug Application (“NDA”) to the FDA for approval of a new dronabinol label, 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 Amendments to the Federal Food, Drug and Cosmetic Act, as amended, in part, to help avoid unnecessary duplication of studies already performed on a previously approved drug; the section gives the FDA express permission to rely on data not developed by the NDA applicant. 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 on 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. This regulatory path offers market protections under the Hatch-Waxman Act, as amended, and the rules promulgated thereunder, providing for market exclusivity. Other regulatory routes are available to pursue proprietary formulations of dronabinol that will provide further market protections. 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.

In conjunction with its management and consultants, RespireRx has developed a regulatory strategy in which we intend to file a new NDA under Section 505(b)(2) claiming the efficacy and safety of our proposed proprietary dronabinol formulation in the treatment of OSA. We have engaged 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, which we believe we could be in a position to submit within 60 days of receiving their communication.

The 505(b)(2) process begins with a pre-IND meeting with the FDA, which will involve discussions of formulation and safety, as well as certain required preclinical and clinical trials. If we can secure sufficient financing, 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 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 FDA should not have major safety concerns with dronabinol in the treatment of OSA.

RespireRx has worked with the PACE investigators and staff, as well as with our Clinical Advisory Panel to design a 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, RespireRx 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. Subject to raising sufficient financing, of which no assurance can be provided, RespireRx intends to submit the Phase 3 protocol to the FDA.

Also, subject to raising sufficient financing, of which no assurance can be provided, RespireRx intends to hire Clinilabs Drug Development Corporation (“Clinilabs”), a full-service CRO, to consult and potentially provide clinical site management, monitoring, data management, and centralized sleep monitoring services for the Phase 3 OSA trial. Dr. Gary Zammitt, CEO of Clinilabs, serves on the RespireRx Clinical Advisory Panel, and his management team has provided guidance on study design and CNS drug development that will be relevant for the Phase 3 program. For example, Clinilabs offers specialized clinical trial services for CNS drug development through an alliance with Neuroclinics, including clinical trials examining the effects of drugs on driving, cognitive effects of food and (medicinal) drugs, and sleep and sleep disordered breathing.

On September 4, 2018, RespireRx entered into a dronabinol Development and Supply Agreement with Noramco Inc.(the “Noramco Agreement”), 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 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. Since entering into the Noramco Agreement, Noramco has assigned the agreement to Purisys LLC (“Purisys”), a subsidiary of Noramco, and Purisys will provide in-kind funding for API manufacturing and supply costs prior to NDA approval and into early commercialization pursuant Noramco’s obligations under the Noramco Agreement.

In consideration for these supplies and services, the Company has agreed (i) 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 (ii) 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.

II. ***Neuromodulators - Project Endeavor - Ampakines and GABA-A***

Neuromodulators are chemicals released by neurons that enable neurons to communicate with one another. This process is called neurotransmission. Neurons release neurotransmitters that attach to a very specific protein structure, termed a receptor, residing on an adjacent neuron. This neurotransmission process can either increase or decrease the excitability of the neuron receiving the message. For example, glutamate is the primary excitatory neurotransmitter in the brain, while gamma-amino-butyric acid ("GABA") is the primary inhibitory neurotransmitter. While the neurotransmitter attachment site on these receptors remains the same, the receptor protein subunit structures can vary so that the receptors can produce a variety of effects, including ion flow into the neurons or enzyme activity within the cells. Certain receptors for these neurotransmitters are composed of protein subunits that assemble so as to form a pore, known as an ion channel. In the case of the alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid glutamate ("AMPA") receptor, the binding of glutamate or an artificial agonist to its attachment site causes a change in the structure of the AMPA receptor ion channel and increases the flow of cations (positively charged ions) into the cell, resulting in an increased excitability. Likewise, in the case of the gamma-amino-butyric acid type A ("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 (anion – negatively charged) into the cell, resulting in a decreased excitability.

Neuromodulators do not act directly at the neurotransmitter binding site, but instead act at accessory sites that enhance (Positive Allosteric Modulators – "PAMs") or reduce (Negative Allosteric Modulators – "NAMs") the actions of neurotransmitters at their primary receptor sites. Neuromodulators have no intrinsic activity of their own. We believe that neuromodulators offer the possibility of developing "kinder and gentler" neuropharmacological drugs with greater pharmacological specificity and reduced side effects compared to present drugs, especially in disorders for which there is a significant unmet or poorly met clinical need such as Attention Deficit Hyperactivity Disorder ("ADHD"), Autism Spectrum Disorder ("ASD"), Fragile X Syndrome ("FSX") and central nervous system ("CNS") driven disorders. We are focused presently on developing drugs that act as positive allosteric modulators ("PAM") at the AMPA and GABA-A receptors.

Building upon our ampakine platform as a foundation, we also are planning the establishment of a second business unit, Project Endeavor, that will focus on developing novel neuromodulators for disorders due to alterations in neurotransmission. Through an extensive series of translational studies from the cellular level up to human Phase 2 clinical trials, selected ampakines have demonstrated target site engagement and positive results in patients with Attention Deficit Hyperactivity Disorder (see below).

Ampakines

Ampakines development for ADHD, FXS and ASD, spinal cord injury ("SCI") and Other CNS-driven Disorders

ADHD

ADHD is one of the most common neurobehavioral disorders, with 6.1% of American children reportedly taking medication for treatment, and ADHD is estimated to affect 7.8% of U.S. children aged 4 to 17 according to the U.S. Centers for Disease Control and Prevention ("CDC"), or approximately 4.5 million children. The principal characteristics of ADHD are inattention, hyperactivity and impulsivity, symptoms that are known to persist into adulthood. In a study published in *Psychiatry Res in May 2010,* up to 78% of children affected by this disorder showed at least one of the major symptoms of ADHD when followed up 10 years later. According to the CDC, approximately 4% of the US adult population has ADHD, which can negatively impair many aspects of daily life, including home, school, work and interpersonal relationships.

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 seen 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, ampakines such as CX717 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 2B clinical trial in patients with adult ADHD using one of our two lead ampakine compounds.

FXS and ASD

According to the Autism Society, more than 3.5 million Americans live with an ASD, a complex neurodevelopmental disorder. FXS is the most common identifiable single-gene cause of autism, affecting approximately 1.4 in every 10,000 males and 0.9 in every 10,000 females, according to the CDC. Individuals with FXS and ASD exhibit a range of abnormal behaviors comprising hyperactivity and attention problems, executive function and cognitive deficits, hyper-reactivity to stimuli, anxiety and mood instability. Also, according the Autism Society, the prevalence rate of ASD has risen from 1 in 150 children in 2000 to 1 in 68 children in 2010, with current estimates indicating a significant rise in ASD diagnosis to 1 in 59 births, placing a significant emotional and economic burden on families and educational systems. The Autism Society estimates the economic cost to U.S. citizens of autism services to be between $236 and $262 billion annually.

Since “autistic disturbances” were first identified in children in 1943, extensive research efforts have attempted to identify the genetic, molecular, environmental, and clinical causes of ASD, but until recently the underlying etiology of the disorder remained elusive. Today, there are no medications that can treat ASD or its core symptoms, and only two anti-psychotic drugs, aripiprazole and risperidone, are approved by the United States Food and Drug Administration (“FDA”) for the treatment of irritability associated with ASD.

Thanks to wide ranging translational research efforts, FXS and ASD are currently recognized as disorders of the synapse with alterations in different forms of synaptic communication and neuronal network connectivity. Focusing on the proteins and subunits of the AMPA receptor complex, autism researchers at the University of San Diego (“UCSD”) have proposed that AMPA receptor malfunction and disrupted glutamate signal transmission may play an etiologic role in the behavioral, emotional and neurocognitive phenotypes that remain the standard for ASD diagnosis. For example, Stargazin, also known as CACNG2 (Ca2+ channel γ2 subunit), is one of four closely related proteins recently categorized as transmembrane AMPA receptor regulating proteins (“TARPs”).

Researchers at UCSD have been studying genetic mutations in the AMPA receptor complex that lead to cognitive and functional deficiencies along the autism spectrum. They work with patients and their families to conduct detailed genetic analyses in order to better understand the underlying mechanisms of autism. In one case, they have been working with a teenage patient who has an autism diagnosis, with a phenotype that is characterized by subtle Tourette-like behaviors, extreme aggression, and verbal and physical outbursts with disordered thought. Despite the behaviors, his language is normal. Using next generation sequencing and genome editing technologies, the researchers identified a specific mutation in Stargazin that alters the configuration and kinetics of the AMPA receptor. When the aberrant sequence was introduced into C57bL6 mice using CRISPR (Clustered Regulatory Interspaced Short Palindromic Repeats), the heterozygous allele had a dominant negative effect on the trafficking of post-synaptic AMPA receptors and produced behaviors consistent with a glutamatergic deficit and similar to what has been observed in the teenage patient.

With funding from the National Institutes of Health to UCSD, RespireRx is working with UCSD to explore the use of ampakines for the amelioration of the cognitive and other deficits associated with AMPA receptor gene mutations. Because CX1739 has an open investigational new drug ("IND") application, subject to securing sufficient outside funding (of which no assurance can be provided), we are considering a Phase 2A clinical trial late in 2020.

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. One frequently studied model of plasticity is long-term facilitation of motor nerve output ("LTF"). 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.

Recently, studies of acute intermittent hypoxia ("AIH") in patients with SCI demonstrate that neural plasticity can be induced to improve motor function. This LTF is based on physiological mechanisms associated with the ability of spinal circuitry to learn how to adjust spinal and brainstem synaptic strength following repeated hypoxic bouts. Because AIH induces spinal plasticity, the potential exists to harness repetitive AIH as a means of inducing functional recovery of motor function following SCI.

RespireRx has been working with Dr. David Fuller, at the University of Florida with funding from the National Institutes of Health, to evaluate the use of ampakines for the treatment of compromised motor function in SCI. Using mice that have received spinal hemisections, 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. In addition, CX717 was observed to produce a dramatic and long-lasting effect on LTF produced by AIH. The doses of ampakines active in SCI were comparable to those demonstrating antagonism of OIRD, indicating target engagement of the AMPA receptors.

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, RespireRx 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 our Clinical Advisory Panel and 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. Currently, we do not have a source of such financing and we can provide no assurance that we will be able to secure sufficient funding.

Other CNS-driven Disorders

Since its formation in 1987, the Company has been engaged in the research and clinical development of ampakines. Ampakines are PAMs of the AMPA glutamate receptor. They enhance the excitatory actions of the neurotransmitter glutamate at the AMPA receptor complex, which mediates most excitatory transmission in the CNS. These drugs do not have agonistic or antagonistic properties but instead positively modulate the receptor rate constants for transmitter binding, channel opening, and desensitization. We currently are developing two lead clinical compounds, CX717 and CX1739, and one pre-clinical compound, CX1942. These compounds belong to a new class of ampakines that do not display the electrophysiological and biochemical effects that led to undesirable side effects, namely convulsive activities, previously reported in animal models of earlier generations.

The Company owns patents and patent applications, or the rights thereto, for certain families of chemical compounds, including ampakines, which claim the chemical structures, their actions as ampakines and their use in the treatment of various disorders. Patents claiming a family of chemical structures, including CX1739 and CX1942, as well as their use in the treatment of various disorders extend through at least 2028. Additional patent applications claiming the use of ampakines in the treatment of certain neurological and neuropsychiatric disorders, such as ADHD have been filed.

In 2007, we determined that expansion of our strategic development into the areas of central respiratory dysfunction, including drug-induced respiratory dysfunction, represented cost-effective opportunities for potentially rapid development and commercialization of RespireRx's compounds. On May 8, 2007, RespireRx entered into a license agreement, as subsequently amended, and no longer in effect with the University of Alberta granting RespireRx exclusive rights to method of treatment patents held by the University of Alberta claiming the use of ampakines for the treatment of various respiratory disorders. These patents, along with RespireRx's own patents claiming chemical structures, comprised RespireRx's principal intellectual property supporting RespireRx's research and clinical development program in the use of ampakines for the treatment of central and drug-induced respiratory disorders. The Company is currently not pursuing respiratory indications for ampakines, at least in part because the license with the University of Alberta is no longer in effect. Much of the work performed while the license was in effect, has informed the Company's new programs.

Through an extensive translational research effort from the cellular level through Phase 2 clinical trials, the Company has developed a family of novel, low impact ampakines, including CX717, CX1739 and CX1942 that have clinical application in the treatment of neurobehavioral disorders, CNS-driven respiratory disorders, spinal cord injury, neurological diseases, and orphan indications. We had been addressing CNS-driven respiratory disorders that affect millions of people, but for which there are few treatment options and limited drug therapies, including opioid induced respiratory disorders, such as apnea (transient cessation of breathing) or hypopnea (transient reduction in breathing). When these symptoms become severe, as in opioid overdose, they are the primary cause of opioid lethality.

RespireRx is committed to advancing the ampakines through the clinical and regulatory path to approval and commercialization. Until recently, RespireRx has focused on the ampakines' ability to antagonize opioid induced respiratory depression both as a translational tool to verify target engagement, as well as an eventual commercial indication. We believe the loss of approximately 69,000 lives in our country in the one year period ending February 2019 alone demands that new solutions for opioid induced deaths be developed to ensure the public health.

RespireRx had previously completed pre-clinical studies indicating that several of its ampakines, including CX717, CX1739 and CX1942, were efficacious in treating drug induced respiratory depression caused by opioids or certain anesthetics without altering the analgesic effects of the opioids or the anesthetic effects of the anesthetics. The results of our preclinical research studies have been replicated in three separate Phase 2A human clinical trials with two ampakines, CX717 and CX1739, confirming the translational mechanism and target site engagement and demonstrating proof of principle that ampakines act as PAMs of AMPA receptors in humans and may be able to be used in humans for the prevention of opioid induced apnea. In addition, RespireRx has conducted a Phase 2A clinical study in which patients with sleep apnea were administered CX1739, RespireRx's lead clinical compound. The results suggested that CX1739 might have use as a treatment for central sleep apnea ("CSA") and mixed sleep apnea, but not OSA.

Based on these initial results, the Company conducted preclinical and clinical research with CX1739, CX717 and CX1942 in the prevention, treatment, and management of opioid induced apnea, the primary cause of overdose deaths. In particular, we had conducted several Phase 2 clinical trials demonstrating that both CX717 and CX1739 significantly reduced opioid induced respiratory depression ("OIRD") without altering analgesia. Since one of the primary risk factors for opioid overdose is CSA, it is significant that a Phase 2A clinical study with CX1739 produced data suggesting a possible reduction in central sleep apnea. Because there are neither drugs nor devices approved to treat CSA, Company management believed there might be potential for a rapid path to commercialization.

Unfortunately, rather than support novel approaches to opioid treatment, the recent public and governmental discourses regarding the "opioid epidemic" has focused almost entirely on the distribution of naloxone, an opioid antagonist used for acute emergency situations, so-called "non-abuseable" opioid formulations, means of reducing opioid consumption by limiting production of opioids and access to legal opioid prescriptions and the development of non-opioid analgesics. It remains to be seen whether these approaches will have an impact on the situation. Nevertheless, as a result, we believe that there is an ongoing industry-wide pullback from opioids, as evidenced by a reduction in opioid prescriptions and a major reduction in manufacturing by two of the largest opioid manufacturers in the United States.

These factors have made it difficult to raise capital or find strategic partners for the development of ampakines for the treatment of opioid induced respiratory depression and we have decided not to pursue this program at this time. We have decided not to attempt to enter into a new license agreement with TEC Edmonton ("TEC Edmonton"), an affiliate of the University of Alberta, at this time and are suspending the development of this program until the political climate is clarified and we are able to either raise funding or enter into a strategic relationship for this purpose. Nevertheless, the valuable data derived from these translational studies have established antagonism of OIRD as a biomarker for demonstrating proof of principle and target engagement in support of continued ampakine development for other indications.

GABA-A Receptor PAMs

In order to expand the asset base of Project Endeavor, we have entered into an option agreement with UWMRF whereby RespireRx has a six-month option commencing on March 2, 2020, to license, certain intellectual property regarding chemical compounds that act as PAMs at certain sub-type specific receptors for GABA, the major inhibitory transmitter in the brain (see Note 10 in the Notes to Consolidated Financial Statements as of December 31, 2019 and 2018, included in this report - Subsequent Events). Certain of these compounds have shown impressive activity in a broad range of animal models of refractory/resistant epilepsy and other convulsant disorders, as well as in brain tissue samples obtained from epileptic patients. Epilepsy is a chronic and highly prevalent neurological disorder that affects millions of people world-wide. While many anticonvulsant drugs have been approved to decrease seizure probability, seizures are not well controlled and, in as many as 60-70% of patients, existing drugs are not efficacious at some point in the disease progression. We believe that the medical and patient community are in clear agreement that there is desperate need for improved antiepileptic drugs. In addition, these compounds have shown positive activity in animal models of migraine, inflammatory and neuropathic pain, as well as other areas of interest. Because of their GABA receptor subunit specificity, the compounds have a greatly reduced liability to produce sedation, motor incoordination, memory impairments and tolerance, side effects commonly associated with non-specific GABA PAMs, such as benzodiazepines.

This program is the subject of the option to license agreement with UWMRF and would officially become a company program upon exercise of the option on or prior to September 2, 2020. The exercise of the option is conditioned upon, among other things, contractual commitment for at least one million dollars of aggregate financing to the Company. There is no guaranty that we will be able to obtain such commitment.

The GABA-A receptor is a pentameric neurotransmitter gated chloride ion channel composed of five transmembrane protein subunits. Multiple cDNAs that encode GABA-A receptor subunits have been cloned and, based on sequence homology, eight subunit families (α, β, γ, δ, ε, θ, π, ρ) comprising 20 distinct gene products have been identified. Based on just the α, β and γ subunits, immunoprecipitation studies suggest the presence of perhaps 10 distinct heteropentamers, creating a considerable degree of receptor subtype heterogeneity.

Benzodiazepines (BDZ), 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, some desirable some not, 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 benzodiazepines were observed to act as GABA 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. 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 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.

While CL218,872 was not clinically tested in humans, a related derivative compound, ocinaplon, displayed similar receptor subtype selectivity and also produced the same pharmacological profile in animal studies as did CL218,872. In Phase 1 clinical studies, ocinaplon was safe and well-tolerated with no BDZ-like effects noted. In two Phase 2 clinical trials in patients suffering from chronic general anxiety disorder (GAD), ocinaplon produced a rapid, highly significant reduction in anxiety scores with no evidence of BDZ-like side effects (Lippa *et al*, 2005; Czobor *et al*, 2010). Development of ocinaplon was halted due to elevations in liver function tests observed in a small number of patients during the conduct of a larger Phase 3 clinical trial. Nevertheless, these results with ocinaplon greatly reinforced the hypothesis that drugs could be developed that selectively produced certain therapeutic effects of the BDZs without displaying their undesirable side effects.

Over the last several years, a group of scientists led by Drs. James Cook and Jeffrey Witkin, now advisors to our Project Endeavor, have synthesized and tested a broad series of novel drugs that display GABA-A receptor subtype selectivity and pharmacological specificity. Dr. Cook is a Distinguished Professor of Chemistry at University Wisconsin-Milwaukee with more than 40 years' experience in organic and medicinal chemistry. He is a leading expert in GABA-A receptor drug targeting, with more than 480 scientific publications and 50 patents. Dr. Witkin, now at the University of Wisconsin-Milwaukee, spent 17 years directing the Neuroscience Discovery Laboratory at Lilly Research Labs where he headed biological efforts to discover multiple antidepressants and novel glutamate and GABA-A receptor neuromodulators. Several of these compounds are in clinical development for depression and epilepsy. Prior to working at the Lilly Research Labs, he headed the Drug Development Group for the intramural research program of the NIH for 14 years. He is a world class scientist with over 220 peer-reviewed publications and multiple scientific awards and honors.

Certain of these chemical compounds are the subject of an option agreement entered into on March 2, 2020, by the Company and UWMRF, an affiliate of the University of Wisconsin-Milwaukee, pursuant to which RespireRx has a six-month option to license the intellectual property identified in United States Patents 9,006,233, 9,597,342, and 10,259,815 and Canadian patent application serial No. 2979701, and all other patents and patent applications in lineage with these priority applications, including PCT (Patent Cooperation Treaty) , utility, divisional, continuation, continuation-in-part, and any corresponding patent applications filed in countries foreign to the United States of America and Canada with priority dates prior to the effective date of the License Agreement.

Of these compounds, we have emphasized KRM-II-81as a clinical lead. KRM-II-81 is the most advanced and druggable of a series of compounds that display certain receptor subtype selective and pharmacological specificity.
In studies using cell cultures, brain tissues and whole animals, KRM-II-81acts as a GABA-A PAM at selective GABA-A receptor subtypes that we feel are intimately involved in neuronal processes underly epilepsy, pain, anxiety and certain other indications. KRM-II-81 has demonstrated highly desirable properties in animal models of epilepsy, pain, anxiety and certain 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 benzodiazepines. We currently are focused on the potential treatment of epilepsy and pain.

Epilepsy

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 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 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 or disconnection (Hwang and Kim, 2019).

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 emphasized by researchers and patient advocacy communities (e.g., http://advocacy.epilepsy.com). Increasing inhibitory tone in the central nervous system 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 benzodiazepines, 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.

KRM-II-81 has demonstrated efficacy in multiple rodent models and measures of antiepileptic drug efficacy *in vivo*. This includes 9 acute seizure provocation models in mice and rats, 4 seizure sensitization models in rats and mice, 2 models of chronic epilepsy, and 3 models specifically testing pharmaco-resistant antiepileptic drug efficacy. Because it appears to have a greatly reduced side effect liability, it might be possible to use higher, more effective doses that 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 epileptic modeling conditions. 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 and associated neural circuits 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 was 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 considerable support to the further development of KRM-II-81 for the treatment of epilepsy.

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 opiates is severely limited due to the rapid development of tolerance and the production of respiratory depression, 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 the 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, the inflammation produced by arthritis or by certain drugs such as cancer chemotherapeutics. For these reasons, management and control of chronic pain continues to be a serious gap in medical practice with multiple alternative medicines that either lack critical efficacy and/or produce unacceptable side-effects.

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 in which gabapentin was compared to placebo in a total of 5914 patients with neuropathic pain, 30% of patients with chronic pain caused by shingles reported a pain reduction of $\geq$50% as compared to 30% for patients receiving placebo. icergIn patients with neuropathic pain caused by diabetes, 40% reported a pain reduction of $\geq$50% as compared to 20% for patients receiving 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 GAGAergic neurotransmission, is the use of GABA-A PAMs. This approach has been under-utilized because of the general lack of efficacy of the 1,4-benzodiazepine GABA modulators. 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 benzodiazepines may be masked by concurrent activation of other 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 compounds, made by Dr. Cook, that selectively amplify α2/3- GABA-A receptor signaling are effective in pain models in rodents at doses lower than those producing motor side effects.

In a number of laboratory procedures, KRM-II-81has been shown to selectively bind to α2/3- GABA-A receptors and enhance GAGAergic neurotransmission. In rodents, KRM-II-81 facilitated GABA-A neurotransmission in the dorsal root ganglion, a primary sensory relay in the pain pathway. In addition, oral administration of KRM-II-81 to rats attenuated formalin-induced pain behaviors and the chronic pain engendered by chronic spinal nerve ligation. KRM-II-81 was also active against acute pain provocation (e.g., acid-induced pain) and inflammatory pain. More recently, KRM-II-81 was shown to be effective against chronic pain induced by a chemotherapeutic agent. Sub-chronic dosing for 22 days with KRM-II-81 and the structural analog, 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 benzodiazepine, 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 benzodiazepines leading to emergency room visits and overdose (Warner *et al*, 2016).

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-81a promising clinical lead and a potential advance in pain therapeutics. Results from preliminary chemistry, metabolism and pharmacokinetic studies support its further development.

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.

Regulation

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 bio-equivalence 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. Given the public health emergency during the winter and spring of 2020, 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 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, 2019 and as of the date of filing of this Annual Report on Form 10-K, the Company employed three people (all officers), two 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

In August 2012, RespireRx acquired Pier Pharmaceuticals, Inc. (“Pier”), which is now its wholly-owned subsidiary.

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). Pier’s business plan was to determine whether dronabinol would significantly improve subjective and objective clinical measures in patients with OSA.

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 Company is required under the 2014 License Agreement, among other terms and conditions, to pay UIC a license fee, royalties, patent costs and certain milestone payments.

University of Alberta License Agreement and Research Agreement

By letter dated May 18, 2018, the Company received notice 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 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 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, SCI, FXS and CNS-driven disorders.

Research and Development Expenses

The Company invested $599,329 and $688,285 in research and development in 2019 and 2018, respectively. Of those amounts, $490,908 and $495,638 were incurred with related parties in 2019 and 2018, respectively. See our consolidated financial statements for the years ended December 31, 2019 and 2018 included in this Annual Report on Form 10-K.

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, 2019 and 2018, 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.

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, 2019, we have generated only minimal operating revenues. For the fiscal year ended December 31, 2019, our net loss was $2,115,033 and as of December 31, 2019, we had an accumulated deficit of $166,509,085. 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, 2019, we estimated that our existing cash resources will not be sufficient to meet our requirements for 2020. 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 of setting up and operating our own marketing and sales organization;
- the ability to obtain funding under contractual and licensing agreements;
- the costs involved in obtaining 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.

To finance our future activities, we may seek funds through additional rounds of financing, including private or public equity or debt offerings and collaborative arrangements with corporate partners. We may also seek to exchange or restructure some of our outstanding securities to provide liquidity, strengthen our balance sheet and provide flexibility. We cannot say with any certainty that these measures will be successful, or that we will be able to obtain the additional needed funds on reasonable terms, or at all. The sale of additional equity or convertible debt securities could result in additional and possibly substantial dilution to our stockholders. If we issued preferred equity or debt securities, these securities could have rights superior to holders of our common stock, and such instruments entered into in connection with the issuance of securities could contain covenants that will restrict our operations. We might have to obtain funds or in-kind services through arrangements with collaborative partners or others that may require us to relinquish rights to our technologies, product candidates or products that we otherwise would not relinquish. If adequate funds are not available in the future, as required, we could lose our key employees and might have to further delay, scale back or eliminate one or more of our research and development programs, which would impair our future prospects. In addition, we may be unable to meet our research spending obligations under our existing licensing agreements and may be unable to continue our business operations.

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 the merger with Pier, the Company gained access to a 2007 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 for the treatment of sleep related breathing disorders (including sleep apnea), of which dronabinol is a specific example of one type of cannabinoid. Dronabinol is a synthetic derivative of the naturally occurring substance in the cannabis plant, otherwise known as Δ9-THC (Δ9-tetrahydrocannabinol). Dronabinol is currently approved by the FDA and is sold generically for use in chemotherapy-induced nausea and vomiting, as well as for anorexia in patients with AIDS. Pier's business plan was to determine whether dronabinol would significantly improve subjective and objective clinical measures in patients with obstructive sleep apnea. In addition, Pier intended to evaluate the feasibility and comparative efficacy of a proprietary formulation of dronabinol. The 2007 License Agreement was terminated effective March 21, 2013 due to the Company's failure to make a required payment and on June 27, 2014, the Company entered into the 2014 License Agreement with UIC that was similar, but not identical, to the 2007 License Agreement that had been terminated. If we are unable to comply with the terms of the 2014 License Agreement, such as required payments thereunder, the 2014 License Agreement might be terminated.

On May 9, 2007, the Company entered into a license agreement with The Governors of the University of Alberta, as subsequently amended, granting he Company exclusive rights to practice patents held by the University of Alberta claiming the use of ampakines for the treatment of various respiratory disorders. By letter dated May 18, 2018, the Company received notice from counsel claiming to represent TEC Edmonton and The Governors of the University of Alberta, which purports to terminate, effective December 12, 2017, the license agreement dated May 9, 2007 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, in February 2019, 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 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, SCI, FXS and CNS-driven disorders.

We may not be able to successfully develop and commercialize our proposed products and technologies.

The development of cannabinoid products and ampakine products is subject to the risks of failure 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 proposed products are in the preclinical or early to mid-clinical stage of development and will require significant additional funding for research, development and clinical testing, which may not be available on favorable terms or at all, before we are able to submit them to any of the regulatory agencies for clearances for commercial use.

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. In a recent study (in the journal BioStatistics, Volume 20, Issue 2, April 2019, pp 273-286) covering approximately 16 years of clinical trial data (both company sponsored clinical trials and non-company sponsored trials), the authors showed transitional success rates from Phase 1 to Phase 2 of 66.4% (failure rate of 33.6%), from Phase 2 to Phase 3 of 58.3% (failure rate of 41.7%) and from Phase 3 to approval of 59.0% (failure rate of 41%). Other studies have shown lower success and higher failure rates. We cannot assure you that we will be able to complete successfully any of our research and development activities including those described above under PART I. Item 1. Business - Development Goals.

Even if we do complete them, we may not be able to market successfully any of the products or be able to obtain the necessary regulatory approvals or assure that healthcare providers and payors will accept our products. We also face the risk that any or all of our products will not work as intended or that they will be unsafe, or that, even if they do work and are safe, that our products 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.

COVID-19 pandemic may affect our ability to successfully develop and commercialize our proposed products and technologies.

The recent COVID-19 pandemic has made it very difficult to recruit subjects and patients and to conduct clinical trials in general. Given the public health emergency during the winter and spring of 2020, 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 following 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.

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 company 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 current good manufacturing 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.

Our business is characterized by intensive research efforts. 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 limited experience in conducting and managing later-stage clinical testing or in preparing applications necessary to obtain regulatory approvals. Although we have engaged regulatory consultants and contract research organizations to assist us in such endeavors, it is possible that our competitors may succeed in developing products, or may obtain FDA approvals for their products faster than we can and/or such competitors may develop products that are safer or more effective than those that we are developing. We expect that competition in this field will continue to intensify.

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 Arnold S. Lippa, Ph.D., our Interim Chief Executive Officer, Interim President, Chief Scientific Officer and Executive Chairman, Jeff E. Margolis, our Senior Vice President, Chief Financial Officer, Treasurer and Secretary, and Richard Purcell, our Senior Vice President of Research and 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.

The market price of securities of life sciences companies in general has been very unpredictable. The range of sales prices of our common stock for the fiscal years ended December 31, 2019 and 2018, as quoted on the OTC QB, was $0.0771 to $0.8500 and $0.4000 to $2.9000, 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 and healthcare regulations.

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, 2019, we had 4,175,072 shares of our common stock outstanding.

If all warrants and options outstanding as of December 31, 2019 were exercised prior to their respective expiration dates, up to 6,478,652 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, 2019, there were remaining outstanding convertible notes totaling $551,591 inclusive of accrued interest. Of that amount, $343,615 was convertible into 7,017,898 shares of common stock and the remainder 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.

On March 22, 2020, four holders of convertible notes convertible into a previously indeterminate number of shares, exchanged $172,911 principal and accrued interest through March 21, 2020, into 11,527,407 shares of common stock. On March 22, 2020, one holder of a convertible note totaling $82,875 of principal and accrued interest exchanged such holder's note into 5,525,017 shares of common stock. On March 22, 2020, two executive officers, each forgave $153,000 of accrued compensation for an aggregate of $306,000 and received an aggregate of 9,000,000 shares of common stock. As a result, a total of 26,052,424 shares of common stock were issued on that date.

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, 2019, 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 at least two 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.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

As of December 31, 2019, 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

On March 10, 2020, Sharp Clinical Services, Inc. filed a complaint and summons dated February 21, 2020 in the Superior Court of New Jersey Law Division, Bergen Count against the Company related to a December 16, 2019 demand for payment of past due invoices of a vendor inclusive of late fees totaling $103,890 of which $3,631 relates to late fees. The complaint and summons seeks $100,259 plus 1.5% interest per month on outstanding unpaid invoices. On Friday March 13, 2020, the RespireRx and its counsel communicated with counsel to this vendor and discussed why a settlement of such matter would be in the best interests of both parties, but has not yet received a response from this vendor or it's counsel. As of December 31, 2019, the Company had recorded accounts payable of $99,959 to such vendor an amount considered by the Company to be reasonable given the ongoing settlement discussions.

On December 16, 2019, RespireRx and Salamandra, LLC ("Salamandra") entered into an amendment (the "Amendment") to the settlement agreement and release, executed August 21, 2019 (the "Original Settlement Agreement" and as amended, the "Amended Settlement Agreement") regarding $202,395 in amounts owed by the Company to Salamandra (as reduced by any further payments by the Company to Salamandra, the "Full Amount") in connection with an arbitration award previously granted in favor of Salamandra in the Superior Court of New Jersey. Under the terms of the Original Settlement Agreement, dated August 21, 2019, the Company was to pay Salamandra $125,000 on or before November 30, 2019 in full satisfaction of the Full Amount owed, subject to conditions regarding the Company's ability to raise certain dollar amounts of working capital. Under the Amended Settlement Agreement, (i) the Company must pay and the Company paid to Salamandra $25,000 on or before December 21, 2019, (ii) upon such payment, Salamandra ceased all collection efforts against the Company until March 31, 2020 (the "Threshold Date"), and (iii) the Company must pay to Salamandra $100,000 on or before the Threshold Date if the Company has at that time raised $600,000 in working capital. Such payments by the Company would constitute satisfaction of the Full Amount owed and would serve as consideration for the dismissal of the action underlying the arbitration award and the mutual releases set forth in the Amended Settlement Agreement. If the Company raises less than $600,000 in working capital before the Threshold Date, the Company may pay to Salamandra an amount equal to 21% of the working capital amount raised, in which case such payment will reduce the Full Amount owed on a dollar-for-dollar basis, and Salamandra may then seek collection on the remainder of the debt. The Company did not make the payment due by March 31, 2020 and has commenced further discussions with Salamandra.

Related to the above matter, and preceding the settlement discussions, by letter dated February 5, 2016, the Company received a demand from a law firm representing Salamandra alleging an amount due and owing for unpaid services rendered. On January 18, 2017, following an arbitration proceeding, an arbitrator awarded the vendor the full amount sought in arbitration of $146,082. Additionally, the arbitrator granted the vendor attorneys' fees and costs of $47,937. All such amounts have been accrued at December 31, 2019 and December 31, 2018, including accrued interest at 4.5% annually from February 26, 2018, the date of the judgment, through December 31, 2019, totaling $7,470.

We are periodically subject to various pending and threatened legal actions and claims. See Note 9 in the Notes to our Consolidated Financial Statements for the years ended December 31, 2019 and 2018—Commitments and Contingencies—*Pending or Threatened Legal Actions and Claims* for additional details regarding these matters.

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 is quoted on the OTC QB, under the symbol "RSPI". The quotations on the OTC QB reflect inter-dealer prices, without retail mark-up, mark-down or commission and may not necessarily represent actual transactions.

As of December 31, 2019, there were 116 stockholders of record of our common stock, and approximately 1,200 beneficial owners. The high and low sales prices for our common stock on December 31, 2019, as quoted on the OTC QB market, were $0.11 and $0.09, respectively, the last date of the fiscal year on which the common stock traded (42,073 shares of common stock).

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, 2019, 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 few or poor treatment options, including obstructive sleep apnea ("OSA"), attention deficit hyperactivity disorder ("ADHD") and recovery from spinal cord injury ("SCI"), as well as certain neurological orphan diseases such as Fragile X Syndrome. RespireRx is developing a pipeline of new drug products based on our broad patent portfolios for two drug platforms: (i) cannabinoids, including dronabinol (synthetic Δ9-THC) that act upon the nervous system's endogenous cannabinoid receptors and (ii) neuromodulators, which we now call Project Endeavor, including (a) ampakines, proprietary compounds that positively modulate AMPA-type glutamate receptors to promote neuronal function and (b) positive allosteric modulators ("PAMs") of the gamma-amino-butyric acid subunit A ("GABA-A") receptors that are the subject of an option agreement dated March 2, 2020 between the Company and the UWM Research Foundation, Inc. ("UWMRF"), an affiliate of the University of Wisconsin-Milwaukee.

Cannabinoids

With respect to the cannabinoid platform, two Phase 2 clinical trials have been completed demonstrating the ability of dronabinol to statistically significantly reduce the symptoms of OSA, which management believes is potentially a multi-billion-dollar market. Subject to raising sufficient financing (of which no assurance can be provided), we believe that we have put most of the necessary pieces into place to rapidly initiate a Phase 3 clinical trial program. By way of definition, when a new drug is allowed by the United States Food and Drug Administration ("FDA") to be tested in humans, Phase 1 clinical trials are conducted in healthy people to determine safety and pharmacokinetics. If successful, Phase 2 clinical trials are conducted in patients to determine safety and preliminary efficacy. Phase 3 trials, large scale studies to determine efficacy and safety, are the final step prior to seeking FDA approval to market a drug.

With the cannabinoid platform, we are considering creating a wholly-owned private subsidiary of RespireRx ("Newco", official name not yet determined) with its own management team and board of directors. We have identified and are in discussions with an individual highly experienced in the cannabinoid industry to potentially serve as the chief executive officer, as well as key opinion leaders to sit on Newco's scientific advisory board ("SAB"). However, we cannot provide assurance that this individual or the SAB candidates will join us. A detailed business plan with *pro forma* budgets has been prepared, which describes our strategy and plans for developing and commercializing the dronabinol platform for the treatment of OSA, including a review of the market opportunity, clinical development and regulatory pathway. A joint development and supply agreement is already in place with Purisys LLC ("Purisys"), a subsidiary of Noramco, Inc., a leading dronabinol manufacturer, in which Purisys will provide in-kind funding for API manufacturing and supply costs prior to NDA approval and into early commercialization. This agreement along with our license with the University of Illinois at Chicago ("UIC"), will need to be transferred or otherwise made available to Newco. While Newco's initial, primary focus will be on re-purposing dronabinol for the treatment of OSA, we believe that our broad enabling patents and a new proprietary formulation may provide a framework for expanding into the larger burgeoning pharmaceutical cannabinoid industry.

Neuromodulators - Project Endeavor - Ampakines and GABA-A

Neuromodulators are chemicals released by neurons that enable neurons to communicate with one another. This process is called neurotransmission. Neurons release neurotransmitters that attach to a very specific protein structure, termed a receptor, residing on an adjacent neuron. This neurotransmission process can either increase or decrease the excitability of the neuron receiving the message.

Neuromodulators do not act directly at the neurotransmitter binding site, but instead act at accessory sites that enhance (Positive Allosteric Modulators – "PAMs") or reduce (Negative Allosteric Modulators – "NAMs") the actions of neurotransmitters at their primary receptor sites. Neuromodulators have no intrinsic activity of their own. We believe that neuromodulators offer the possibility of developing "kinder and gentler" neuropharmacological drugs with greater pharmacological specificity and reduced side effects compared to present drugs, especially in disorders for which there is a significant unmet or poorly met clinical need such as Attention Deficit Hyperactivity Disorder ("ADHD"), Autism Spectrum Disorder ("ASD"), Fragile X Syndrome ("FSX") and central nervous system ("CNS") driven disorders. We are focused presently on developing drugs that act as positive allosteric modulators ("PAM") at the AMPA and GABA-A receptors.

Building upon our ampakine platform as a foundation, we also are planning the establishment of a second business unit, which we now call collectively with the ampakines, Project Endeavor, that will focus on developing novel neuromodulators for disorders due to alterations in neurotransmission. Through an extensive series of translational studies from the cellular level up to human Phase 2 clinical trials, selected ampakines have demonstrated target site engagement and positive results in patients with Attention Deficit Hyperactivity Disorder (see below).

Through an extensive ampakine translational research effort from the cellular level through Phase 2 clinical trials, the Company has developed a family of novel, low impact ampakines, including CX717, CX1739 and CX1942 that may have clinical application in the treatment of CNS-driven neurobehavioral and cognitive disorders, spinal cord injury, neurological diseases, and certain orphan indications. From our ampakine platform, our lead clinical compounds, CX717 and CX1739, have successfully completed multiple Phase 1 safety trials. Both compounds have also completed Phase 2 efficacy trials demonstrating target engagement, by antagonizing the ability of opioids to induce respiratory depression. CX717 has successfully completed a Phase 2 trial demonstrating the ability to statistically 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 spinal injury. Subject to raising sufficient financing (of which no assurance can be provided), we believe that we will be able to rapidly initiate a human Phase 2 study with CX1739 and/or CX717 in patients with spinal cord injury and a human Phase 2B study in patients with ADHD with either CX717 or CX1739.

In order to expand the asset base of Project Endeavor, we have entered into an option agreement with UWMRF whereby RespireRx has a six-month option commencing on March 2, 2020, to license, certain intellectual property regarding chemical compounds that act as positive allosteric modulators ("PAMs") at certain sub-type specific receptors for GABA, the major inhibitory transmitter in the brain (see Subsequent Events). Certain of these compounds have shown impressive activity in a broad range of animal models of refractory/resistant epilepsy and other convulsant disorders, as well as in brain tissue samples obtained from epileptic patients. Epilepsy is a chronic and highly prevalent neurological disorder that affects millions of people world-wide. While many anticonvulsant drugs have been approved to decrease seizure probability, seizures are not well controlled and, in as many as 60-70% of patients, existing drugs are not efficacious at some point in the disease progression. We believe that the medical and patient community are in clear agreement that there is desperate need for improved antiepileptic drugs. In addition, these compounds have shown positive activity in animal models of migraine, inflammatory and neuropathic pain, as well as other areas of interest. Because of their GABA receptor subunit specificity, the compounds have a greatly reduced liability to produce sedation, motor incoordination, memory impairments and tolerance, side effects commonly associated with non-specific GABA PAMs, such as benzodiazepines.

Our major challenge has been to raise substantial equity or equity-linked financing to support research and development programs for our two drug 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, limited float and low market capitalization as a result of our low stock price. For this reason, RespireRx is considering an internal restructuring plan that contemplates spinning out our two drug platforms into separate operating businesses.

We believe that by creating Newco and Project Endeavor, it may be possible, through separate finance channels, to optimize the asset values of both the cannabinoid platform and the neuromodulation platform.

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, 2019 until June 30, 2020.

UWM Research Foundation Option Agreement

In March 2020, RespireRx and UWM Research Foundation, an affiliate of the University of Wisconsin-Milwaukee, entered into an option agreement ("UWMRF Option Agreement") pursuant to which RespireRx has a six-month option to license the identified intellectual property pursuant to license terms substantially in the Form of a Patent License Agreement ("UWMRF License Agreement") that is attached to the UWMRF Option Agreement as Appendix I. The UWMRF License Agreement, if it becomes effective, will expand the Company's neuromodulator program which has historically included the Company's ampakine program to include a GABA-A program as well. See Note 10. Subsequent Events in the Notes to the Consolidated Financial Statements for the years ended December 31, 2019 and 2018, included with this report.

Resignation of Member of the Board of Directors and Filling of Vacancy

On January 28, 2020, Mr. Timothy Jones was appointed to the Board of Directors of the Company to fill the vacancy created by the resignation of Mr. James Sapirstein on December 20, 2019.

December 2018 and January, February and March 2019 Convertible Notes and December 31, 2014 Convertible Notes

In December 2018 and in January, February and March 2019, the Company issued eight convertible notes to five holders of such notes with an aggregate principal amount of $190,000 which notes were convertible into an indeterminate number of shares of common stock and which matured on either February 28, 2019 or April 30, 2019. Investors who purchased these notes also received an aggregate of 190,000 common stock purchase warrants. The Company did not repay these notes at maturity. On March 22, 2020, six of the eight notes, held by four holders, totaling $172,911 of principal plus accrued interest were exchanged in their entirety for 11,527,407 shares of common stock.

On March 22, 2020, the holder of a convertible noted dated December 31, 2014, totaling $82,875 in aggregate principal and interest was exchanged in its entirety for 5,525,017 shares of common stock.

See Note 4. Notes Payable – Convertible Notes Payable in the Notes to Consolidated Financial Statements for the years ended December 31, 2019 and 2018, included with this report for a detailed description of the terms of, and accounting for, the above-referenced convertible notes.

April, May, August, October and November 2019 Convertible Notes

In April, May, August, October and November 2019, the Company entered into five securities purchase agreements, entered into and executed instructions to its transfer agent regarding reserves and other related agreements and documents and issued five related convertible notes in the aggregate initial principal amount of $393,500. See Note 4. Notes Payable – Convertible Notes Payable in the Notes to Consolidated Financial Statements for the years ended December 31, 2019 and 2018, 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 9,000,000 (4,500,000 each) shares of common stock. See Note 10. Subsequent Events in the Notes to Consolidated Financial Statements for the years ended December 31, 2019 and 2018.

Complaint and Summons

On March 10, 2020, Sharp Clinical Services, Inc. filed a complaint and summons dated February 21, 2020 in Superior Court of New Jersey Law Division, Bergen County against the Company related to a December 16, 2019 demand for payment of past due invoices inclusive of late fees totaling $103,890 of which $3,631 relates to late fees. The complaint and summons seeks $100,259 plus 1.5% interest per month on outstanding unpaid invoices. On Friday March 13, 2020, the RespireRx and its counsel communicated with counsel to this vendor and discussed why a settlement of such matter would be in the best interests of both parties, but has not yet received a response from this vendor or it's counsel. As of December 31, 2019, the Company had recorded accounts payable of $99,959 to such vendor an amount considered by the Company to be reasonable given the ongoing settlement discussions.

Salamandra

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

Other Proposed Settlement

In February 2020, the Company and a vendor agreed to discuss amendments to an agreement in principal reached on September 23, 2019, whereby the Company and a vendor agreed in principle to a proposed settlement agreement, which has not resulted in a formal agreement. The discussions included, among other things, an extension of time to raise the amount discussed below. The September 23, 2019 agreement in principal calls for no reduction in the overall amount to be paid by the Company, which amount is not in dispute, but addresses only a payment schedule. The agreement in principal calls for a payment of a minimum of $100,000 on or before November 30, 2019 assuming the Company has raised at least $600,000 by that date and thereafter calls for a payment of $50,000 per month until paid in full. If the Company does not make a scheduled payment, the agreement in principal would be deemed null and void.

University of Alberta (TEC Edmonton)

On May 9, 2007, the Company entered into a license agreement with The Governors of the University of Alberta, as subsequently amended, granting the Company exclusive rights to practice patents held by the University of Alberta claiming the use of ampakines for the treatment of various respiratory disorders. 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 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, SCI, FXS and CNS-driven disorders.

Impression Healthcare Limited

On May 14, 2019, the exclusivity period of the non- binding memorandum of understanding ("MOU") between the Company and Impression Healthcare Limited ("IHL") expired. The MOU had been entered into on February 13, 2019, for the purpose of negotiating terms by which the parties would enter in an arrangement, such as a license, joint venture or partnership agreement, so as to commercialize dronabinol for the treatment of OSA in Australia, New Zealand and Southeast Asia. Discussions are in progress. The Company does not currently intend to pursue a transaction with IHL.

Recent Accounting Pronouncements

For a description of recent accounting pronouncements, see Note 3 in the Notes to Consolidated Financial Statements for the fiscal years ended December 31, 2019 and 2018, 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.

Under a patent license agreement in respect to which, the Company had engaged in a dispute resolution process with TEC Edmonton on behalf of The Governors of the University of Alberta, the Company had maintained that it has exclusive rights to the use of certain ampakine compounds to prevent and treat respiratory depression induced by opioid analgesics, barbiturates and anesthetic and sedative agents. As discussed above, the Company does not currently intend to enter into a new license with The Governors of the University of Alberta or pursue the prevention and treatment of respiratory depression induced by opioid analgesics, barbiturates and anesthetic and sedative agents.

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. Dronabinol is a synthetic derivative of the naturally occurring substance in the cannabis plant, otherwise known as Δ9-THC (Δ9-tetrahydrocannabinol). Dronabinol is currently approved by the FDA and is sold generically for use in refractory chemotherapy-induced nausea and vomiting, as well as for anorexia in patients with AIDS. Pier's business plan was to determine whether dronabinol would significantly improve subjective and objective clinical measures in patients with OSA. The 2007 License Agreement was terminated effective March 21, 2013 due to the Company's failure to make a required payment 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. If the Company is unable to comply with the terms of the 2014 License Agreement, such as an inability to make the payments required thereunder, the Company would be at risk of the 2014 License Agreement being terminated.

As of December 31, 2019, the Company received an extension of time to make a $100,000 payment that would have due on such date. Extensions have been granted until June 30, 2020 (See Note 10 in Notes to Consolidated Financial Statements as of December 31, 2019 and 2018, included with this report – Subsequent Events).

Critical Accounting Policies and Estimates

The Company prepared its consolidated financial statements in accordance with accounting principles generally accepted in the United States of America. The preparation of these consolidated financial statements requires the use of estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amount of revenues and expenses during the reporting period. Management periodically evaluates the estimates and judgments made. Management bases its estimates and judgments on historical experience and on various factors that are believed to be reasonable under the circumstances. Actual results may differ from these estimates as a result of different assumptions or conditions.

The following critical accounting policies affect the more significant judgments and estimates used in the preparation of the Company's consolidated financial statements.

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.

Note Exchange Agreements

See Note 4 to the Notes to Consolidated Notes Payable – Convertible Notes Payable in the Notes to Consolidated Financial Statements for the years ended December 31, 2019 and 2018, included with this report for information on our "Note Exchange Agreements" during the years ended December 31, 2019 and 2018.

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,	
	2019	2018
Operating expenses:		
General and administrative, including $485,332 and $740,975 to related parties for the years ended December 31, 2019 and 2018, respectively	$ 1,137,175	$ 1,488,238
Research and development, including $490,908 and $495,638 to related parties for the years ended December 31, 2019 and 2018, respectively	599,329	688,286
Total operating costs and expenses	1,736,504	2,176,524
Loss from operations	(1,736,504)	(2,176,524)
Loss on extinguishment of debt and other liabilities in exchange for equity	-	(166,382)
Interest expense, including $60,135 and $42,821 to related parties for the years ended December 31, 2019 and 2018, respectively	(404,661)	(136,243)
Foreign currency transaction (loss) gain	26,132	(112,641)
Net loss	$ (2,115,033)	$ (2,591,790)
Net loss per common share - basic and diluted	$ (0.54)	$ (0.77)
Weighted average common shares outstanding - basic and diluted	3,908,479	3,351,105

Years Ended December 31, 2019 and 2018

Revenues. During the year ended December 31, 2019 and 2018, the Company had no revenues.

General and Administrative. For the year ended December 31, 2019, general and administrative expenses were $1,137,175, a decrease of $351,063, as compared to $1,488,238 for the year ended December 31, 2018.

Stock-based compensation costs and fees included in general and administrative expenses were $0 for the December 31, 2019, as compared to $14,248 for the year ended December 31, 2018, reflecting a decrease of $14,248. The decrease is the result of the fact that no stock-based compensation was granted to general and administrative employees of the Company during the year ended December 31, 2019. Salaries and employee benefits included in general and administrative expenses were $439,807 for the year ended December 31, 2019 as compared to $685,884 for the year ended December 31, 2018, a decrease of $246,077. The decrease is primarily due to the full year elimination of the salary and employee benefits of the former Chief Executive Officer and President in the year ended December 31, 2019 as compared to the elimination of only one quarter of a year of such expenses in the year ended December 31, 2018. Legal fees for general corporate purposes were $213,289 for the year ended December 31, 2019 as compared to $278,373 for the year ended December 31, 2018, a decrease of $65,084. Legal fees for patents and other patent expenses included in general and administrative expenses were $147,722 for the year ended December 31, 2019, a decrease of $51,641 as compared to $199,363 for the year ended December 31, 2018. The decreases in both general legal fees and legal fees associated with patents and other patent costs is a result of a reduction in utilization of professional resources as part of the Company's cost control efforts, partially offset by patent legal fees associated with patent filings made in October 2019.

The remaining $25,987 of increases in general and administrative expenses is due to a number of increases partially offset by decreases in a number of other expense categories.

Research and Development. For the year ended December 31, 2019, research and development expenses were $599,329, a decrease of $88,957, as compared to $688,286 for the year ended December 31, 2018, primarily due to a decrease in the utilization of consultants and a decrease in research contract expenses.

Loss on Extinguishment of Debt and other Liabilities in Exchange for Equity. There was no loss on extinguishment of debt or other liabilities for the year ended December 31, 2019 as compared to a loss of $166,382 for the year ended December 31, 2018.

Interest Expense. During the year ended December 31, 2019, interest expense was $404,661 (including $60,135 to related parties of which $49,863 is to a single vendor that is also a related party representing interest on invoices subject to delayed payment), an increase of $268,418, as compared to $136,243 (including $42,821 to related parties) for the year ended December 31, 2018. The increase in interest expense resulted primarily from interest on five new convertible notes issued from January through March 2019 totaling $110,000 of principal amount in 2019, and five additional new convertible notes issued in April, May, August, October and November 2019 totaling $393,500 of principal and additional interest with respect to the Salamandra legal settlement as well as from a single vendor associated with the delay of cash remittances to that vendor.

Foreign Currency Transaction Loss or Gain. The foreign currency transaction gain was $26,132 for the year ended December 31, 2019, as compared to a foreign currency transaction loss of $112,641 for the year ended December 31, 2018. 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, 2019, the Company incurred a net loss of $2,115,033, as compared to a net loss of $2,591,790 for the year ended December 31, 2018.

Liquidity and Capital Resources – December 31, 2019

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 $2,115,033 for the fiscal year ended December 31, 2019 and $2,591,790 for the fiscal year ended December 31, 2018, and negative operating cash flows of $487,745 and $427,368 for the fiscal years ended December 31, 2019 and 2018 respectively. The Company had a stockholders' deficiency of $7,444,819 at December 31, 2019 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, 2019, has expressed substantial doubt about the Company's ability to continue as a going concern (see "Going Concern" below).

At December 31, 2019, the Company had a working capital deficit of $7,444,819, as compared to a working capital deficit of $5,736,369 at December 31, 2018, reflecting an increase in the working capital deficit of $1,708,450 for the fiscal year ended December 31, 2019. This increase is comprised of an increase in total current liabilities of $1,632,702, and a decrease in current assets of $78,862. The increase in total current liabilities consists of a net increase in accounts payable and accrued expenses of $468,910, an increase in accrued compensation and related expenses of $779,407, an increase in convertible notes payable of $311,925, an increase in the note payable to SY Corporation of $21,795, an increase in notes payable to officers and former officers of $54,938 partially offset by a decrease in other short-term notes payable of $4,273.

At December 31, 2019, the Company had cash aggregating $16,690 as compared to $33,284 at December 31, 2018, reflecting a decrease in cash of $16,594 during the fiscal year ended December 31, 2019.

Operating Activities

For the fiscal year ended December 31, 2019, operating activities utilized cash of $487,745 as compared to utilizing cash of $427,368 for the fiscal year ended December 31, 2018, to support the Company's ongoing operations and research and development activities.

Financing Activities

For the fiscal year ended December 31, 2019, financing activities consisted of ten convertible note financings.

In January, February and March 2019, the Company issued new 10% convertible notes, due on either February 28, 2019 or April 30, 2019 with face amounts of $110,000 in the aggregate. Common stock purchase warrants were issued in connection with such notes. The Company valued the warrants and recorded an original issue discount associated with the new 10% convertible notes which was then amortized in its entirety during 2019. On March 22, 2020 the principal and accrued interest related to four of the five notes was exchanged for shares of common stock.

In April, May, August, October and November 2019, the Company issued five new convertible notes due on dates ranging from 9 months to 12 months from the issue date. The aggregate amounts payable at maturity of these notes was $393,500. Certain of these notes were partially settled through conversions of portions of the maturity amounts into shares of common stock.

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 $2,115,033 for the fiscal year ended December 31, 2019 and $2,591,790 for the fiscal year ended December 31, 2018, and negative operating cash flows of $487,745 and $427,368 for the fiscal years ended December 31, 2019 and 2018, respectively. The Company had a stockholders' deficiency of $7,444,819 at December 31, 2019 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, 2019, 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. 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 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

On October 12, 2018, after the resignation of Dr. James Manuso effective September 30, 2018, Dr. Lippa was named Interim President and Interim Chief Executive Officer (see Note 9 in the Notes to Consolidated Financial Statements for the fiscal years ended December 31, 2019 and 2018). 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 and Dr. Lippa entered into an employment agreement as amended. The agreement's term automatically extends on September 30 for successive one-year periods, 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 earns an annual base salary of $300,000 and is 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 under the Company's stock and options plans and is eligible to receive additional awards in accordance with his employment agreement 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, 2019. 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 of the Notes to Consolidated Financial Statements for the fiscal years ended December 31, 2019 and 2018, included with this report. Accrued cash compensation inclusive of employee benefits accrued pursuant to this agreement totaled $339,600 for each of the fiscal years ended December 31, 2019 and 2018, respectively, which amounts are included in accrued compensation and related expenses in the Company's consolidated balance sheet at December 31, 2019 and 2018, and in research and development expenses in the Company's consolidated statement of operations for the fiscal years ended December 31, 2019 and 2018. Dr. Lippa does not receive any additional compensation for serving as Executive Chairman and on the Board of Directors.

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. As amended, the agreement's term automatically extends on September 30 for successive one-year periods, 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 been granted stock options on several occasions under the Company's stock and options plans and is eligible to receive additional awards in accordance with the terms of his employment agreement 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 of the Notes to Consolidated Financial Statements for fiscal years ended December 31, 2019 and 2018, included with this report. Accrued cash compensation pursuant to this agreement totaled $321,600 for the fiscal year ended December 31, 2019 and 2018 which amounts are included in accrued compensation and related expenses in the Company's consolidated balance sheet as of December 31, 2019 and 2018, and in general and administrative expenses in the Company's consolidated statement of operations.

The employment agreements between the Company and each of 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.

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, 2019, was extended to June 30, 2020,. 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, 2019 and 2018, the Company recorded charges to operations of $100,000, respectively, with respect to its 2019 and 2018 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, 2019 and 2018.

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. 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 (now through Purisys LLC) 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.

UWM Research Foundation

On March 2, 2020, RespireRx and UWM Research Foundation, an affiliate of the University of Wisconsin-Milwaukee, entered into an option agreement ("UWMRF Option Agreement") pursuant to which RespireRx has a six-month option to license the identified intellectual property pursuant to license terms substantially in the Form of a Patent License Agreement ("UWMRF License Agreement") that is attached to the UWMRF Option Agreement as Appendix I. The UWMRF License Agreement, if it becomes effective, will expand the Company's neuromodulator program which has historically included the Company's ampakine program to include a GABA-A program as well. See Note 10. Subsequent Events in the Notes to Consolidated Financial Statements for the fiscal years ended December 31, 2019 and 2018, included with this report.

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, 2019, aggregating $995,900. Employment agreement amounts included in the 2020 column represent amounts contractually due from January 1, 2020 through September 30, 2020 when such contracts expire unless extended pursuant to the terms of the contracts.

		Payments Due By Year				
	Total	2020	2021	2022	2023	2024
License agreements	$ 500,000	$100,000	$100,000	$100,000	$100,000	$100,000
Employment agreements (1)	495,900	495,900	-	-	-	-
Total	$ 995,900	$595,900	$100,000	$100,000	$100,000	$100,000

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

Off-Balance Sheet Arrangements

At December 31, 2019, 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. Current management has instituted a program to reestablish the Company's accounting and financial staff and install new accounting and internal control systems, and has retained accounting personnel, established accounting and internal control systems, addressed the preparation of delinquent financial statements, and worked diligently to bring current delinquent SEC filings as promptly as reasonably possible under the circumstances. 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 completed the process to establish adequate internal controls over financial reporting. In February 2017, the Company's Chief Financial Officer resigned and one of the existing officers was appointed Interim Chief Financial Officer and subsequently, Chief Financial Officer. The Company has not completed its search for a permanent replacement.

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 Interim Chief Executive Officer and our Chief Financial Officer, has evaluated our internal control over financial reporting as of December 31, 2019 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 as it has existed from October 2012 through December 2019, as well as the various factors discussed herein, our management has concluded that material weaknesses in the Company's internal control over financial reporting existed as of December 31, 2019, as a result of which our internal control over financial reporting was not effective at December 31, 2019.

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, 2019 that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting.

Item 9B. Other Information

Arnold S. Lippa, the Company's Interim Chief Executive Officer, Interim President and Chief Scientific Officer has extended credit to the Company on April 15, 2019 for operating expenses by making a payment of $25,000 to the Company's auditors which amount has been accounted for by the Company as an advance by Dr. Lippa payable on demand. The balance of the amount payable to the auditors has been paid directly by the Company. Dr. Lippa and Mr. Margolis have made advances to the Company on April 13, 2020 totaling $18,500 in the aggregate, which funds were utilized to make a payment of $18,000 to the Company's auditors.

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.	73	2013	Interim Chief Executive Officer, Interim President, Chief Scientific Officer and Chairman of the Board of the Company
Jeff E. Margolis	64	2013	Senior Vice President, Chief Financial Officer, Treasurer and Secretary of the Company and President of Aurora Capital LLC, an investment banking and securities brokerage firm
Kathryn MacFarlane, PharmD	54	2014	Owner and Managing Partner of SmartPharma LLC, a consulting firm
Timothy Jones	46	2020	From September 2019 until April 2020, Mr. Jones was Vice President Global Pharmaceutical and Medical OTC at Purisys LLC. From August 2017 to September 2019, Mr. Jones was Vice President Business Development-Global Cannabinoids Portfolio at Noramco Inc. From September 2015 to August 2017, he was Director of Global API Purchasing/Primary API Sourcing Consultant at QuVa Pharma Inc. From June 2014 to June 2015, he was Vice President Strategic Portfolio Management at Midas Pharmaceuticals Inc.

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 ContraVir 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 former and current positions of Chief Executive Officer and President and Interim Chief Executive Officer and Interim President as well as his position as the Company's Chief Scientific Officer, 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 received approval to join the Board of Directors of the Company from Purisys subject to (i) Mr. Jones' recusal from Company discussions about Noramco or Purisys, and (ii) Mr. Jones' relinquishment of responsibility of the Company's account representation to the Chief Executive Officer and President of Purisys. 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, 2018, each of our executive officers except 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 Dr. Lippa and Mr. Margolis. 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 of $12,500. Additional information with respect to shares of common stock that have been issued to Mr. Purcell is provided at Note 6. Stockholders' Deficiency in the Notes to Consolidated Financial Statements for the fiscal years ended December 31, 2019 and 2018, included with this report.

Name	Position with Company
Arnold S. Lippa, Ph.D.	Interim Chief Executive Officer, Interim President, Chief Scientific Officer and Chairman of the Board
Jeff E. Margolis	Senior Vice President, Chief Financial Officer, Treasurer and Secretary
Richard Purcell	Senior Vice President of Research and Development

Richard Purcell: In addition to his role at the Company, Richard Purcell (Age: 59) has managed a consulting firm, DNA Healthlink, Inc. Since 2005, Mr. Purcell has been advising emerging biopharmaceutical and technology companies on new business strategy, operations management, and clinical development of novel compounds. In his role as Executive Vice President of Research and Development for Generex, he is active in strategic planning, business development, clinical operations, R&D, and M&A. Mr. Purcell has over 30 years of experience in consulting and advising emerging biopharmaceutical and technology companies on new business strategy, operations management, clinical development of novel compounds, data solutions for clinical and medical applications, patient engagement and communication, medical education for professionals and consumers, and data analytics for outcomes research. He is a biopharmaceutical development specialist, with extensive experience in providing consulting services to financial, venture capital, and start-up companies to concentrate on new business strategy and clinical development of novel compounds.

From 2011 to 2017, Mr. Purcell was the President and founder of a Healthcare IT startup, IntelliSanté. Previously, Mr. Purcell was President of ClinPro, Inc., a mid-sized clinical research organization (CRO). At ClinPro, Mr. Purcell was responsible for the company's business development, strategic planning, sales and IT operations. His significant expertise in designing and executing clinical studies for the marketing of drugs was critical to expand the company's operations into the global marketplace. Prior to joining ClinPro, Mr. Purcell worked for SCP Communications ("SCP"), a medical communications company, where he served as Corporate Vice President and General Manager of the Clinical Programs Division. During his time at SCP, he founded SCP Clinical Programs, a CRO specializing in Phase IIIb and Phase IV clinical research studies. At SCP, Mr. Purcell designed and managed a number of clinical programs for such drugs as Lipitor, Avandia, Accolate, Meridia, and Tequin. In addition, he participated in the start-up of the number one medical Web site, Medscape, through sales and business development initiatives. Early in his career, Mr. Purcell was the Business Manager of the pharmaceutical and biotechnology practice at a management consulting firm, the Kline Group, after beginning his career as a scientist at Hoffmann-LaRoche and Integrated Genetics.

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, 2019 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. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

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 2019

The table below summarizes the total compensation paid or earned by each of the named executive officers for the fiscal years ended December 31, 2019 and 2018. 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 and Chief Scientific Officer	2019	339,600	-	-	-	339,600
	2018	339,600	-	-	-	339,600
Jeff E. Margolis Senior Vice President, Chief Financial Officer, Treasurer and Secretary	2019	321,600	-	-	-	321,600
	2018	321,600	-	-	-	321,600
Richard Purcell, Senior Vice President of Research and Development	2019	150,000	-	-	49,863	199,863
	2018	150,000	-	-	17,682	$ 167,682

(1) The 2019 and 2018 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, 2019 and 2018. Mr. Purcell has been the Senior Vice President of Research and Development for the Company since October 15, 2014 and provides services to the Company on a month-to-month basis through DNA Healthlink, Inc. at the rate of $12,500 per month.

(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 Richard Purcell is the amount of interest charged by DNA Healthlink, Inc. for delayed payment of invoices.

Narrative to Summary Compensation Table

In 2019 and 2018, 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 Dr. Lippa and Mr. Margolis.

In connection with the recent changes to our board membership and 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, 2018, 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**
Arnold S. Lippa	46,154	0	0	8.125	6/30/22
	30,769	0	0	6.396	8/18/22
	73,847	0	0	7.3775	3/31/21
	50,000	0	0	3.90	1/17/22
	50,000	0	0	2.00	6/30/22
	559,595	0	0	1.45	12/9/27
Jeff E. Margolis	46,154	0	0	8.125	6/30/22
	30,769	0	0	6.396	8/18/22
	73,847	0	0	7.3775	3/31/21
	50,000	0	0	3.90	1/17/22
	50,000	0	0	2.00	6/30/22
	25,000	0	0	2.00	7/26/22
	388,687	0	0	1.45	12/9/27
Richard Purcell	6,154	0	0	8.125	6/30/22
	9,231	0	0	6.396	8/18/22
	61,539	0	0	7.3775	3/31/21
	40,000	0	0	3.90	1/17/22
	40,000	0	0	2.00	6/30/22
	100,000	0	0	1.45	12/9/27

At December 31, 2019, there were 1,731,746 options outstanding to named executive officers all of which had vested.

OPTION EXERCISES AND STOCK VESTED FOR 2019

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, 2019. There were no unvested option awards as of December 31, 2019 and 2018. As of December 31, 2019, collectively, the named executive officers, held options to purchase 1,731,746 shares of the Company's common stock, all of which had vested, at an exercise prices ranging from $1.45 to $8.125 per share.

Employment Agreements – Termination or Change in Control

Two of the Company's named executive officers, Arnold S. Lippa, Ph.D. and Jeff E. Margolis (each an "Executive"), entered into employment agreements with the Company on 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 August 19, 2015. The employment agreements that would have terminated on September 30, 2018 for the two named executive officers above, were automatically extended for periods of one year pursuant to the terms of such agreements on September 30, 2018 and 2019. 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 third 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.

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, 2019. 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 ($)(1)	Total ($)
James Sapirstein	58,207			58,207
Kathryn MacFarlane	60,000			60,000

(1) No options were granted in 2019 or 2018.
(2) $15,000 per quarter was earned for each non-employee member of the board of directors. Mr. Sapirstein's fees earned reflect fees earned through his resignation in December 2019.

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 March 22, 2020, the latest date practicable for the preparation of this table, 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 as of March 22, 2020, (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 December 31, 2018 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.

Directors, Officers and 5% Stockholders[1]	Number of Shares of Beneficial Ownership of Common Stock	Percent of Class
Todd Binder[2] 15933 Asilomar Blvd. Pacific Palisades, CA 90272	5,525,017	17.16%
Arnold Lippa Family Trust of 2007[3]	5,641,081	17.09%
Dariusz Naziek[4] 55 Hardwick Lane Wayne, NJ 07470	5,378,135	16.68%
John Safranek MD[5] 3508 Poppleton Avenue Omaha, NE 68105	3,651,748	11.25%
Jeffrey Harvey[6] 3521 Rockaway Avenue Annapolis, MD 21403	1,634,573	5.08%
DIRECTORS AND OFFICERS		
Jeff E. Margolis[7]	5,215,867	15.87%
Arnold S. Lippa, Ph.D.[8]	1,416	0.00%
Timothy Jones[9]	-	-%
Kathryn MacFarlane[10]	140,421	0.43%
Richard Purcell[11]	263,077	0.81%
All directors and officers as a group	5,620,781	15.16%

(1) Except as otherwise indicated, the address of such beneficial owner is c/o RespireRx Pharmaceuticals Inc., 126 Valley Road, Suite C, Glen Rock, New Jersey 07452.

(2) All of these holdings were acquired on March 22, 2020 pursuant to an exchange agreement resulting in the cancellation of a convertible promissory note and the issuance of this amount of common stock.

(3) All of these holdings were acquired by Dr. Arnold Lippa and subsequently transferred to the Trust, or are held by an entity owned by the Trust. Dr. Lippa is neither the trustee nor the beneficiary of the Trust. Linda Lippa, his wife, is a beneficiary of the Trust.

(4) 5,165,371 of these holdings were acquired on March 22, 2020 pursuant to an exchange agreement resulting in the cancellation of a convertible promissory note and the issuance of this amount of common stock. Additionally, Dr. Nasiek's holdings include 168,697 shares acquired by the conversion of Series G Convertible Preferred Stock or by exchange of his Convertible Note and the related Warrant and Extension Warrant and by exchange in respect to the 2015 unit offering. Dr. Nasiek also holds 44,067 warrants. Some of Dr. Nasiek's holdings are owned jointly with his spouse.

(5) 3,393,333 of these holdings were acquired on March 22, 2020 pursuant to an exchange agreement resulting in the cancellation of a convertible promissory note and the issuance of this amount of common stock. Additionally, Dr. Safranek's holdings include 216,138 shares of common stock acquired in various private placement unit offerings, some of which shares of common stock are held jointly with his spouse. Also included in Dr. Safranek's holdings are warrants to purchase 42,277 shares of common stock, also acquired in various private placement unit offerings. Excluded from Dr. Safranek's holdings are warrants to purchase 240,000 shares of common stock due to certain blocker provisions prohibiting exercise of such warrant in part or in whole if such exercise were to increase the investor's holding above 4.99%.

(6) 1,491,296 of these holdings were acquired on March 22, 2020 pursuant to an exchange agreement resulting in the cancellation of a convertible promissory note and the issuance of this amount of common stock. 143,277 of these holdings were acquire in previous exempt private placements. 105,000 are represented by warrants acquired in 2017. Excluded from Mr. Harvey's holdings are warrants to purchase 20,000 shares of common stock due to certain blocker provisions prohibiting exercise of such warrant in part or in whole if such exercise were to increase the investor's holding above 4.99%.

(7) Mr. Margolis's holdings were transferred to six trusts of which Mr. Margolis is the trustee of three of those trusts and Mr. Margolis' spouse is the trustee of the other three trusts. In the aggregate, the holdings of the trusts include: (i) 4,546,565 shares of common stock, (ii) options to acquire an additional 664,457 shares of common stock, and (iii) the 4,845 warrants to purchase shares of common received as an owner of Aurora Capital LLC from the warrants Aurora received as a placement agent in the sale of the Company's Common Stock and Warrant Financing.

(8) Dr. Lippa's holdings include: (i) 598 shares of common stock, and (ii) 818 warrants to purchase shares of common stock. In addition, Dr. Lippa no longer beneficially owns many of the shares of the Company that were initially awarded to him because he has transferred these shares into family trusts, of which he is neither the trustee nor the beneficiary, including the Arnold Lippa Family Trust of 2007 as noted in footnote 3 above. In addition, Dr. Lippa has been awarded options to acquire an additional 15,385 shares of common stock which have been assigned to another family trust for the benefit of other family members. Dr. Lippa is neither the trustee nor the beneficiary of that trust.

(9) Timothy Jones was appointed to the Board of Directors on January 28, 2020. Mr. Jones does not currently own any shares of common stock, options or warrants, or any other securities convertible in common stock.

(10) Dr. MacFarlane's holdings include: (i) 6,153 shares of common stock, and (ii) options to purchase 134,268 shares of common stock.

(11) Mr. Purcell's holdings include: (i) 6,153 shares of common stock, and (ii) options to purchase 256,924 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

The following table sets forth information regarding outstanding options, warrants and rights and shares reserved for future issuance under our existing equity compensation plans as of December 31, 2019. In March 2014, the Company's stockholders approved, by written consent, the Cortex Pharmaceuticals, Inc. 2014 Equity, Equity-Linked and Equity Derivative Incentive Plan, filed as exhibit 10.2 to the Company's Current Report on Form 8-K filed March 24, 2014, which provides for the issuance of shares of the Company's stock, in the form of stock grants and options 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, filed as exhibit 10.1 to the Company's Current Report on Form 8-K filed July 8, 2015, which similarly provides for the issuance of equity and equity derivative securities such as options.

The Company amended the 2015 Stock and Stock Option Plan on March 31, 2016 and January 17, 2017, December 9, 2017, and December 28, 2018 and filed descriptions of such amendments on the Company Current Report on Form 8-K on April 6, 2016, January 23, 2017, December 14, 2017, and January 4, 2019, respectively. The amendments discussed above primarily increased the number of shares available under the 2015 Plan as approved by the board of directors, with the latest amendment expanding the plan to 8,985,260 shares. The Company has not presented, nor does it intend to present, the 2015 Stock and Stock Option Plan to shareholders for approval.

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	15,635	$	6.403	63,245
Equity compensation plans not approved by security holders (including non-plan options)	4,271,974	$	3.369	4,427,342
Total	4,287,609	$	3.380	4,490,587

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

Director Independence

As of December 31, 2019, 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, 2019, all of the functions of the Audit, Compensation and Governance and Nominations Committees were being performed by the full board of directors. As of January 28, 2020, Timothy Jones was appointed to the board of directors and was also determined to be an "independent director" as described above. Dr. Lippa and Mr. Margolis are not "independent directors" as defined above.

Transactions with Related Persons

In 2019, the Company engaged in certain transactions with Arnold S. Lippa, our Chairman, Interim President, Interim Chief Executive Officer and our Chief Scientific Officer, and certain of his affiliates, and Jeff Eliot Margolis, our then Chief Executive Officer. These transactions have been previously disclosed and are discussed in and Note 2 in the Notes to Consolidated Financial Statements as of December 31, 2019 and 2018 - Notes Payable – *Advances from and Notes Payable to Officers* and in the Note 4 in the Notes to Consolidated Financial Statements as of December 31, 2019 and 2018 - Business – *Going Concern*. Dr. Lippa has extended credit to the Company on April 15, 2019 for operating expenses by making a payment of $25,000 to the Company's auditors which amount has been accounted for by the Company as an interest free advance by Dr. Lippa payable on demand. The balance of the amount payable to the auditors has been paid directly by the Company.

On July 3, 2018, Jeff Eliot Margolis made an interest free advance to the Company of $6,500, of which $1,000 was repaid to Mr. Margolis on November 15, 2019. The outstanding balance is payable on demand.

On September 4, 2018, RespireRx entered into Noramco Agreement, which was subsequently assigned to Purisys, an affiliate of Noramco formed in September 2019. See "Item 1. Business – Manufacturing." On January 28, 2020, Mr. Timothy Jones was appointed to the Board of Directors of the Company to fill the vacancy created by the resignation of Mr. James Sapirstein. Until April 9, 2020, Mr. Jones was the Vice President Global Pharmaceutical and Medical OTC at Purisys. Mr. Jones received approval to join the Board of Directors of the Company from Purisys subject to (i) Mr. Jones' recusal from Company discussions about Noramco or Purisys, and (ii) Mr. Jones' relinquishment of responsibility of the Company's account representation to the Chief Executive Officer and President of Purisys. As of April 9, 2020, Mr. Jones was no longer employed by and has accepted a severance package from Purisys.

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, 2019 and 2018 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 2019 and 2018.

	2019	2018
Audit Fees[1]	$ 98,700	$ 99,000
Audit-Related Fees[2]	-	-
Tax Fees[3]	-	-
All Other Fees[4]	-	-
Total	$ 98,700	$ 99,000

(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.

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, 2019 and 2018

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, 2019 and 2018, the related consolidated statements of operations, stockholders' equity (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, 2019 and 2018, 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.

HASKELL & WHITE LLP

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

Irvine, California
April 14, 2020

RESPIRERX PHARMACEUTICALS INC.
AND SUBSIDIARY

CONSOLIDATED BALANCE SHEETS

	December 31, 2019	December 31, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	$ 16,690	$ 33,284
Advance payment on research contract	-	48,912
Prepaid expenses, including current portion of long-term prepaid insurance of $10,586 at December 31, 2019 and $14,945 at December 31, 2018	28,638	38,880
Total current assets	45,328	121,076
Long-term prepaid insurance, net of current portion of $10,586 and $14,945 at December 31, 2019 and December 31, 2018 respectively	-	3,114
Total assets	$ 45,328	$ 124,190
LIABILITIES AND STOCKHOLDERS' DEFICIENCY		
Current liabilities:		
Accounts payable and accrued expenses, including $476,671 and $400,229 payable to related parties at December 31, 2019 and 2018, respectively	$ 3,772,030	$ 3,303,120
Accrued compensation and related expenses	2,083,841	1,304,434
Convertible notes payable, currently due and payable on demand, including accrued interest of $113,304 and $62,635 at December 31, 2019 and 2018, respectively, (of which $43,666, including accrued interest of $18,666, was deemed to be in default at December 31, 2019) (Note 4)	551,591	239,666
Note payable to SY Corporation, including accrued interest of $363,280 and $315,307 at December 31, 2019 and 2018, respectively (payment obligation currently in default – Note 4)	766,236	744,441
Notes and advances payable to officers, including accrued interest of $35,388 and $25,116 at December 31, 2019 and 2018, respectively (Note 4)	142,238	102,716
Notes payable to former officer, including accrued interest of $41,977 and $26,561 as of December 31, 2019 and December 31, 2018, respectively (Note 4)	169,577	154,161
Other short-term notes payable	4,634	8,907
Total current liabilities	7,490,147	5,857,445
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 0.00030 common shares per Series B share: 11	21,703	21,703
Common stock, $0.001 par value; shares authorized: 65,000,000; shares issued and outstanding: 4,175,072 and 3,872,076 at December 31, 2019 and 2018, respectively	4,175	3,872
Additional paid-in capital	159,038,388	158,635,222
Accumulated deficit	(166,509,085)	(164,394,052)
Total stockholders' deficiency	(7,444,819)	(5,733,225)
Total liabilities and stockholders' deficiency	$ 45,328	$ 124,190

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,	
	2019	**2018**
Operating expenses:		
General and administrative, including $485,332 and $740,975 to related parties for the years ended December 31, 2019 and 2018, respectively	$ 1,137,175	$ 1,488,238
Research and development, including $490,908 and $495,638 to related parties for the years ended December 31, 2019 and 2018, respectively	599,329	688,286
Total operating costs and expenses	1,736,504	2,176,524
Loss from operations	(1,736,504)	(2,176,524)
Loss on extinguishment of debt and other liabilities in exchange for equity	-	(166,382)
Interest expense, including $60,135 and $42,821 to related parties for the years ended December 31, 2019 and 2018, respectively	(404,661)	(136,243)
Foreign currency transaction (loss) gain	26,132	(112,641)
Net loss	$ (2,115,033)	$ (2,591,790)
Net loss per common share - basic and diluted	$ (0.54)	$ (0.77)
Weighted average common shares outstanding - basic and diluted	3,908,479	3,351,105

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

RESPIRERX PHARMACEUTICALS INC.
AND SUBSIDIARY

CONSOLIDATED STATEMENT OF STOCKHOLDERS' DEFICIENCY

Years Ended December 31, 2019 and 2018

	Series B Convertible Preferred Stock		Common Stock		Additional		Total
	Shares	Amount	Shares	Par Value	Paid-in Capital	Accumulated Deficit	Stockholders' Deficiency
Balance at December 31, 2017	37,500	$ 21,703	3,065,261	$ 3,065	$157,422,110	$(161,802,262)	$ (4,355,384)
Fair value of common stock options issued for services	-	-	-	-	29,248		29,248
Fair value of common stock options issued in exchange for accrued compensation and accounts payable					335,529		335,529
Common stock issued related to extinguishment of convertible notes	-	-	284,358	284	318,236		318,520
Sale of common stock units in private placement, net of escrow fees of $5,000	-	-	191,194	191	195,559		195,750
Issuance of common stock units in exchange for note payable to officer	-	-	47,620	48	49,952		50,000
Fair value of warrants issued in connection issuance of units in exchange for note payable to officer					49,975		49,975
Issuance of common stock to patent counsel			283,643	284	198,266		198,550
Fair value of original issue discount associated with warrants issued with convertible notes					36,347		36,347
Net Loss						$ (2,591,790)	$ (2,591,790)
Balance at December 31, 2018	37,500	$ 21,703	3,872,076	$ 3,872	$158,635,222	$(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			17,500	17	3,316		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			285,496	286	25,019		25,305
Net Loss						$ (2,115,033)	$ (2,115,033)
Balance at December 31, 2019	37,500	$ 21,703	4,175,072	$ 4,175	$159,038,388	$(166,509,085)	$ (7,444,819)

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,	
	2019	**2018**
Cash flows from operating activities:		
Net loss	$ (2,115,033)	$ (2,591,790)
Adjustments to reconcile net loss to net cash used in operating activities:		
Amortization of debt discounts related to convertible notes payable	215,575	8,378
Costs associated with convertible note conversion paid with common stock	750	
Loss on extinguishment of debt	-	105,254
Loss on extinguishment of other liabilities	-	11,154
Loss on exchange of officer note	-	49,974
Stock-based compensation and fees included in -		
General and administrative expenses	-	14,248
Research and development expenses	-	15,000
Foreign currency transaction loss (gain)	(26,132)	112,641
Changes in operating assets and liabilities:		
(Increase) decrease in -		
Prepaid expenses and advanced clinical research payments	13,355	18,962
Increase (decrease) in -		
Accounts payable and accrued expenses	524,324	703,682
Accrued compensation and related expenses	779,407	1,025,484
Accrued interest payable	120,009	99,645
Net cash used in operating activities	(487,745)	(427,368)
Cash flows from financing activities:		
Proceeds from sale of common stock units and issuance of restricted stock, net of fees	-	195,750
Proceeds from officer notes	22,751	100,000
Proceeds from issuance of notes payable	478,150	80,000
Capitalized note costs	(29,750)	
Net cash provided by financing activities	471,151	375,750
Cash and cash equivalents:		
Net decrease	(16,594)	(51,618)
Balance at beginning of period	33,284	84,902
Balance at end of period	$ 16,690	$ 33,284

(Continued)

RESPIRERX PHARMACEUTICALS INC.
AND SUBSIDIARY

CONSOLIDATED STATEMENTS OF CASH FLOWS
(Continued)

	Years Ended December 31,	
	2019	**2018**
Supplemental disclosures of cash flow information:		
Cash paid for -		
Interest	$ 5,130	$ 3,345
Non-cash financing activities:		
10% convertible notes payable, including accrued interest of $62,267 exchanged for common stock	$ -	$ 213,266
Principal on convertible notes payable paid with common stock	$ 24,554	$ -
Conversion fees paid with common stock upon principal payment on convertible notes payable	$ 750	$ -
Accounts payable and accrued expenses extinguished with common stock options	$ -	$ 138,273
Accrued compensation extinguished with option to purchase common stock options	$ -	200,350
Officer note payable, exchanged for common stock and warrants	$ -	50,000
Short-term note payable issued in connection with financing of directors and officers insurance policy	$ 61,746	$ 63,750
Short-term note payable issued in connection with financing of clinical trial and other office insurance policies	$ 9,322	$ 9,322
Fair value of common stock issued to service provider	$ -	$ 198,550

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, 2019 and 2018

1. Organization and Basis of Presentation

Organization

RespireRx Pharmaceuticals Inc. ("RespireRx," the "Company," "we" or "our" includes our wholly-owned subsidiary, Pier Pharmacuticals, Inc., unless the context indicates otherwise) 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 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. While previously developing potential applications for respiratory disorders, RespireRx has retained and expanded its neuromodulator intellectual property and data with respect to neurological and psychiatric disorders and is considering developing certain potential products in this platform, if it is able to obtain additional financing and/or strategic relationships.

In August 2012, RespireRx acquired Pier Pharmaceuticals, Inc. ("Pier"), which is now its wholly-owned subsidiary.

In March 2020, RespireRx and UWM Research Foundation, an affiliate of the University of Wisconsin-Milwaukee, entered into an option agreement ("UWMRF Option Agreement") pursuant to which RespireRx has a six-month option to license the identified intellectual property pursuant to license terms substantially in the Form of a Patent License Agreement ("UWMRF License Agreement") that is attached to the UWMRF Option Agreement as Appendix I. The UWMRF License Agreement, if it becomes effective, will expand the Company's neuromodulator program which has historically included the Company's ampakine program to include a GABA-A program as well. See Note 10. Subsequent Events.

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 few or poor treatment options, including obstructive sleep apnea ("OSA"), attention deficit hyperactivity disorder ("ADHD") and recovery from spinal cord injury ("SCI"), as well as certain neurological orphan diseases such as Fragile X Syndrome. RespireRx is developing a pipeline of new drug products based on our broad patent portfolios for two drug platforms: (i) cannabinoids, including dronabinol (a synthetic form of Δ9-THC) that act upon the nervous system's endogenous cannabinoid receptors and (ii) neuromodulators, which we now call Project Endeavor, including (a) ampakines, proprietary compounds that positively modulate AMPA-type glutamate receptors to promote neuronal function and (b) positive allosteric modulators ("PAMs") of the gamma-amino-butyric acid subunit A ("GABA-A") receptors that are the subject of an option agreement dated March 2, 2020 between the Company and the UWM Research Foundation, Inc. ("UWMRF"), an affiliate of the University of Wisconsin-Milwaukee. See Note 10. Subsequent Events.

Cannabinoids

With respect to the cannabinoid platform, two Phase 2 clinical trials have been completed demonstrating the ability of dronabinol to statistically significantly reduce the symptoms of OSA, which management believes is potentially a multi-billion-dollar market. Subject to raising sufficient financing (of which no assurance can be provided), we believe that we have put most of the necessary pieces into place to rapidly initiate a Phase 3 clinical trial program. By way of definition, when a new drug is allowed by the United States Food and Drug Administration ("FDA") to be tested in humans, Phase 1 clinical trials are conducted in healthy people to determine safety and pharmacokinetics. If successful, Phase 2 clinical trials are conducted in patients to determine safety and preliminary efficacy. Phase 3 trials, large scale studies to determine efficacy and safety, are the final step prior to seeking FDA approval to market a drug.

With the cannabinoid platform, we plan to create a wholly-owned private subsidiary of RespireRx (“Newco”, official name not yet determined) with its own management team and board of directors.

Neuromodulators – Project Endeavor - Ampakines and GABA-A

Neuromodulators are chemicals released by neurons that enable neurons to communicate with one another. This process is called neurotransmission. Neurons release neurotransmitters that attach to a very specific protein structure, termed a receptor, residing on an adjacent neuron. This neurotransmission process can either increase or decrease the excitability of the neuron receiving the message.

Neuromodulators do not act directly at the neurotransmitter binding site, but instead act at accessory sites that enhance (Positive Allosteric Modulators – “PAMs”) or reduce (Negative Allosteric Modulators – “NAMs”) the actions of neurotransmitters at their primary receptor sites. Neuromodulators have no intrinsic activity of their own. We believe that neuromodulators offer the possibility of developing “kinder and gentler” neuropharmacological drugs with greater pharmacological specificity and reduced side effects compared to present drugs, especially in disorders for which there is a significant unmet or poorly met clinical need such as Attention Deficit Hyperactivity Disorder (“ADHD”), Autism Spectrum Disorder (“ASD”), Fragile X Syndrome (“FSX”) and CNS-driven disorders. We are focused presently on developing drugs that act as positive allosteric modulators (“PAM”) at the AMPA and GABA-A receptors.

Building upon our ampakine platform as a foundation, we also are planning the establishment of a second business unit, which we now call collectively with the ampakines, Project Endeavor, that will focus on developing novel neuromodulators for disorders due to alterations in neurotransmission. Through an extensive series of translational studies over a number of years, but numerous researchers and from the cellular level up to human Phase 2 clinical trials, selected ampakines have demonstrated target site engagement and positive results in patients with Attention Deficit Hyperactivity Disorder (see below).

Through an extensive ampakine translational research effort from the cellular level through Phase 2 clinical trials, the Company has developed a family of novel, low impact ampakines, including CX717, CX1739 and CX1942 that may have clinical application in the treatment of CNS-driven neurobehavioral and cognitive disorders, spinal cord injury, neurological diseases, and certain orphan indications. From our ampakine platform, our lead clinical compounds, CX717 and CX1739, have successfully completed multiple Phase 1 safety trials. Both compounds have also completed Phase 2 efficacy trials demonstrating target engagement, by antagonizing the ability of opioids to induce respiratory depression. CX717 has successfully completed a Phase 2 trial demonstrating the ability to statistically 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 spinal injury. Subject to raising sufficient financing (of which no assurance can be provided), we believe that we will be able to rapidly initiate a human Phase 2 study with CX1739 and/or CX717 in patients with spinal cord injury and a human Phase 2B study in patients with ADHD with either CX717 or CX1739.

In order to expand the asset base of Project Endeavor, we have entered into an option agreement with UWMRF whereby RespireRx has a six-month option commencing on March 2, 2020, to license, certain intellectual property regarding chemical compounds that act as positive allosteric modulators ("PAMs") at certain specific receptors for gamma-amino-butyric acid type A ("GABA-A"), a major inhibitory transmitter in the brain (see Subsequent Events). Certain of these compounds have shown impressive activity in a broad range of animal models of refractory/resistant epilepsy and other convulsant disorders, as well as in brain tissue samples obtained from epileptic patients in pre-clinical research conducted at the University of Wisconsin-Milwaukee by Drs. James Cook and Jeffrey Witkin among others and at collaborating institutions. Epilepsy is a chronic and highly prevalent neurological disorder that affects millions of people world-wide. While many anticonvulsant drugs have been approved to decrease seizure probability, seizures are not well controlled and, in as many as 60-70% of patients, existing drugs are not efficacious at some point in the disease progression. We believe that the medical and patient community are in clear agreement that there is desperate need for improved antiepileptic drugs. In addition, these compounds have shown positive activity in animal models of migraine, inflammatory and neuropathic pain, as well as other areas of interest. Because of their GABA receptor subunit specificity, the compounds have a greatly reduced liability to produce sedation, motor incoordination, memory impairments and tolerance, side effects commonly associated with non-specific GABA PAMs, such as benzodiazepines.

Our major challenge has been to raise substantial equity or equity-linked financing to support research and development programs for our two drug 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, limited float and low market capitalization as a result of our low stock price. For this reason, RespireRx is considering an internal restructuring plan that contemplates spinning out our two drug platforms into separate operating businesses.

We believe that by creating Newco and Project Endeavor, it may be possible, through separate finance channels, to optimize the asset values of both the cannabinoid platform and the neuromodulation platform.

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 $2,115,033 and $2,591,790 for the fiscal years ended December 31, 2019 and 2018, respectively, and negative operating cash flows of $487,745 and $427,368 for the fiscal years ended December 31, 2019 and 2018, respectively. The Company also had a stockholders' deficiency of $7,444,819 at December 31, 2019 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, 2019, 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.

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.

Fair 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, advances on research grants 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.

Extinguishment of Debt

The Company accounts for the extinguishment of debt in accordance with GAAP by comparing the carrying value of the debt to the fair 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 2019 for directors' and officers' insurance as well as the amount paid in April 2019 for office-related insurances and clinical trial coverage. Directors' and officers' insurance tail coverage, purchased in March 2013 and which is a seven-year policy, is being amortized on a straight-line basis over the policy period and all amounts due within one year are reclassified as current prepaid insurance. The amount amortizable in the ensuing twelve-month period is 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. Amounts due after the ensuing year are recorded as long-term prepaid insurance.

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 by measuring the value of the 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 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 fair 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.

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. During fiscal year ended December 31, 2018, there were stock grants totaling 283,643 shares of common stock to designees of one vendor with a value on the date of the grant of $198,550 which amount paid $198,550 of account payable to that vendor. There was no gain or loss on such stock grant.

For stock options requiring an assessment of value during the fiscal years ended December 31, 2019 and 2018, the fair value of each stock option award was estimated using the Black-Scholes option-pricing model using the following assumptions:

	2019	2018
Risk-free interest rate	-%	2.64-2.89%
Expected dividend yield	-%	0%
Expected volatility	-%	186.07-222.64%
Expected life at date of issuance	-	5 years

The expected life is estimated to be equal to the term of the common stock options issued in 2018.

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, 2019 and 2018.

There were no warrants issued as compensation or for services during the fiscal years ended December 31, 2019 and 2018 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, 2019, 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, 2019, 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 Interim Chief Executive Officer and Interim President who is also 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. 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 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.

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, 2019 and 2018, 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,	
	2019	**2018**
Series B convertible preferred stock	11	11
Convertible notes payable	7,017,896	16,319
Common stock warrants	2,191,043	1,783,229
Common stock options	4,344,994	4,344,994
Total	13,553,944	6,144,553

Reclassifications

Certain comparative figures in 2018 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 March 2020, The FASB issued Accounting Standards Update No. 2020-03, Codification Improvements to Financial Instruments. There are seven issues addressed in this update. Issues 1 – 5 were clarifications and codifications of previous updates. Issue 3 relates only to depository and lending institutions and therefore would not be applicable to the Company. Issue 6 was a clarification on determining the contractual term of a net investment in a lease for purposes of measuring expected credit losses, an issue not applicable to the Company. Issue 7 relates to the regaining control of financial assets sold and the recordation of an allowance for credit losses. The amendment related to issues 1, 2, 4 and 5 become effective immediately upon adoption of the update. Issue 3 becomes effective for fiscal years beginning after December 15, 2019. Issues 6 and 7 become effective on varying dates that relate to the dates of adoption other updates. Management's initial analysis is that it does not believe the new guidance will substantially impact the Company's financial statements.

In November 2019, the FASB issued Accounting Standards Update No. 2019-08, "Compensation-Stock Compensation (Topic 718) and Revenue from Contracts with Customers (Topic 606)-*Codification Improvements-Share-Based Consideration Payable to a Customer*. The update provides measurement guidance that when share-based consideration is granted to a customer, it is treated as a reduction is the transaction price and that the amount recorded as the reduction should be based on the grant-date fair value of the share-based payment award. For entities that have not yet adopted the amendments in Accounting Standards Update 2018-07, the amendments of this update are effective for public entities in fiscal years beginning after December 14, 2019, and interim periods within those fiscal years. Management's initial analysis is that it does not believe the new guidance will substantially impact the Company's financial statements.

In August 2018, the FASB issued Accounting Standards Update No. 2018-13, "Fair Value Measurement (Topic 820), Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement." The amendments in this update modify the disclosure requirements on fair value measurements in Topic 820, Fair Value Measurement. These amendments affect the disclosures of the fair value of financial instruments. See Note 3. Summary of Significant Account Policies – *Fair Value of Financial Instruments.* The amendments in this update are effective for public business entities for fiscal years beginning after December 15, 2019, including interim periods within that fiscal year. Management has not concluded its evaluation of the guidance. Its initial analysis is that it does not believe the new guidance will substantially impact the Company's financial statements.

In June 2018, the FASB issued Accounting Standards Update No. 2018-07 ("ASU 2018-07"), *Compensation-Stock Compensation (Topic 718)—Improvements to Nonemployee Share-Based Payment Accounting.* ASU 2018-07 are amendments to Topic 718 that become effective for public entities like the Company for fiscal years beginning after December 15, 2018, including interim periods within that fiscal year. This update applies to nonemployee share-based awards within the scope of Topic 718. Consistent with the accounting requirement for employee share-based payment awards, nonemployee share-based payment awards are measured at grant-date fair value of the equity instruments that an entity is obligated to issue when the good has been delivered or the service has been rendered and any other conditions necessary to earn the right to benefit from the instruments have been satisfied. Equity-classified nonemployee share- based payment awards are measured at the grant date. The definition of the term grant date has been amended to generally state the date at which a grantor and a grantee reach a mutual understanding of the key terms and conditions of a share- based payment award. An entity considers the probability of satisfying performance conditions when nonemployee share-based payment awards contain such conditions. This is consistent with the treatment for employee-based awards. Generally, the classification of equity- classified nonemployee share-based payment awards will continue to be subject to the requirements of Topic 718 unless modified after the good has been delivered, the service has been rendered, any other conditions necessary to earn the right to benefit from the instruments have been satisfied, and the nonemployee is no longer providing goods or services. This eliminates the requirement to reassess classification of such awards upon vesting. This standard will change the valuation of applicable awards granted in subsequent periods.

4. Notes Payable

Convertible Notes Payable

On November 4, 2019, the Company issued a convertible note (the "November 2019 Convertible Note") bearing interest at 10% per year. The maturity amount is $170,000 and it matures on November 4, 2020. The Company incurred debt issuance costs of

$14,000, which included $8,500 of lender legal fees and $5,500 in placement agency fees paid to Aurora Capital LLC, a registered broker-dealer and an affiliate of the Company. The transaction included a $13,600 original issue discount. The transaction did not include any warrants or commitment shares. The net proceeds to the Company directly from the lender was $147,900, from which the Company then directly paid the $5,500 placement agency fee for final net proceeds of $142,400. Subject to certain limitations and adjustments as described in the November 2019 Convertible Note, the holder may convert the November 2019 Convertible Note at a fixed conversion price of $0.50 per share of common stock, provided that from the date that is six months after the issuance date, the conversion price shall be 60% multiplied by the lowest closing price of the common stock during the twenty (20) consecutive trading days prior to conversion. The Company evaluated all of the terms of the November 2019 Convertible Note and determined that, in accordance with ASC 815, there were no derivatives to be bifurcated or separately valued. However, there were three features of the November 2019 Convertible Note and the related securities purchase agreement that required valuation. They were: (i) the debt issuance costs of $14,000, (ii) the intrinsic value of the beneficial conversion feature, and (iii) the original issue discount of $13,600. The amount to be recorded initially as the amount of the November 2019 Convertible Note was calculated by determining the relative values as percentages of the net proceeds of the November 2019 Convertible Note ($142,400), the beneficial conversion feature ($142,400) The debt issuance costs, original issue discount and the amount recorded as the intrinsic value of the beneficial conversion feature each are being amortized to interest expense on a straight-line basis over the life the November 2019 Convertible Note.

The table below provides a summary of the November 2019 Convertible Note as of December 31, 2019.

Principal amount of note payable	$	170,000
Debt discounts, net of amortization of $26,940		(143,060)
Accrued coupon interest		2,701
	$	29,641

On October 22, 2019, the Company issued a convertible note (the "October 2019 Convertible Note") bearing interest at 10% per year. The maturity amount is $60,000 and it matures on July 22, 2020. The Company incurred debt issuance costs of $3,750 for lender legal fees and due diligence fees. The transaction included a $1,750 original issue discount, a warrant to purchase 175,000 shares of common stock and 10,000 Commitment Shares (as such term is defined in the definitive transaction documents), which were issued in connection with the October 2019 Convertible Note. The net proceeds to the Company were $54,500. Subject to certain limitations and adjustments as described in the October 2019 Convertible Note, the holder may convert the October 2019 Convertible Note at a fixed conversion price of $0.50 per share of common stock, provided that from the date that is six months after the issuance date, the conversion price shall be 60% multiplied by the lowest trading price of the common stock during the twenty (20) consecutive trading days prior to conversion considering only trades of 100 shares of common stock or more. The Company evaluated all of the terms of the October 2019 Convertible Note and determined that, in accordance with ASC 815, there were no derivatives to be bifurcated or separately valued. However, there were five features of the October 2019 Convertible Note and the related securities purchase agreement that required valuation. They were: (i) the debt issuance costs of $3,750, (ii) the intrinsic value of the beneficial conversion feature, (iii) the value of the warrant, (iv) the original issue discount of $1,750, and (v) the value of the Commitment Shares. The Company valued the warrant using the Black-Scholes valuation method utilizing the following assumptions: (i) exercise price of $0.50, (ii) stock price of $0.31, (iii) life of five years, (iv) five-year risk free rate of 1.60% and (v) volatility of 476.01% that results in the value of one warrant of $0.310 and a total warrant value of $54,250. The amount to be recorded initially as the amount of the October 2019 Convertible Note was then calculated by determining the relative values as percentages of the net proceeds of the October 2019 Convertible Note ($54,500), and the warrant (46.23% or $27,738) and the Commitment Shares (2.64% or $1,585). The intrinsic value of the beneficial conversion feature was then calculated based on the value attributed to the October 2019 Convertible Note. The debt issuance costs, original issue discount and the amount recorded as the intrinsic value of the beneficial conversion feature each are being amortized to interest expense on a straight-line basis over the life the October 2019 Convertible Note.

The table below provides a summary of the October 2019 Convertible Note as of December 31, 2019.

Principal amount of note payable	$	60,000
Debt discounts, net of amortization of $16,490		(47,512)
Accrued coupon interest		1,167
	$	13,655

On August 19, 2019, the Company issued a convertible note (the "August 2019 Convertible Note") bearing interest at 10% per year. The maturity amount is $55,000 and it matures on May 19, 2020. The Company incurred debt issuance costs of $2,500 for lender legal fees. The transaction included a $5,000 original issue discount, a warrant to purchase 150,000 shares of common stock and 7,500 Commitment Shares (as such term is defined in the definitive transaction documents), which were issued in connection with the August 2019 Convertible Note. The net proceeds to the Company were $47,500. Subject to certain limitations and adjustments as described in the August 2019 Convertible Note, the holder may convert the August 2019 Convertible Note at a fixed conversion price of $0.50 per share of common stock, provided that from the date that is six months after the issuance date, the conversion price shall be the lower of (a) $0.50 or (b) 60% multiplied by the lowest closing price of the common stock during the twenty (20) consecutive trading days prior to conversion. The Company evaluated all of the terms of the August 2019 Convertible Note and determined that, in accordance with ASC 815, there were no derivatives to be bifurcated or separately valued. However, there were five features of the August 2019 Convertible Note and the related securities purchase agreement that required valuation. They were: (i) the debt issuance costs of $2,500, (ii) the intrinsic value of the beneficial conversion feature, (iii) the value of the warrant, (iv) the original issue discount of $5,000, and (v) the value of the Commitment Shares. The Company amortizes each of these five on a straight-line basis over the life of the August 2019 Convertible Note. The Company valued the warrant using the Black-Scholes valuation method utilizing the following assumptions: (i) exercise price of $0.50, (ii) stock price of $0.65, (iii) life of five years, (iv) five-year risk free rate of 1.47% and (v) volatility of 175.5% that results in the value of one warrant of $0.623 and a total warrant value of $93,450. The amount to be recorded initially as the amount of the August 2019 Convertible Note was then calculated by determining the relative values as percentages of the net proceeds of the August 2019 Convertible Note ($47,500) and the warrant (64.08% or $30,440) and the Commitment Shares (3.34% or $1,588). The intrinsic value of the beneficial conversion feature was then calculated based on the value attributed to the August 2019 Convertible Note. The debt issuance costs, original issue discount and the amount recorded as the intrinsic value of the beneficial conversion feature each are being amortized to interest expense on a straight-line basis over the life the August 2019 Convertible Note.

The table below provides a summary of the August 2019 Convertible Note as of December 31, 2019.

Principal amount of note payable	$	55,000
Debt discounts, net of amortization of $27,781		(27,218)
Accrued coupon interest		2,034
	$	29,816

On May 17, 2019, the Company issued a master convertible note (the "May 2019 Convertible Note") issuable in tranches, bearing interest at 10% per year, bearing a maximum maturity amount of $150,000. The first tranche has a maturity amount of $50,000 and matures on May 17, 2020. There was a stated original issue discount of $5,000 and the Company incurred debt issuance costs of $2,000 for lender legal fees. The net proceeds to the Company were $43,000. Subject to certain limitations and adjustments as described in the May 2019 Convertible Note, the holder may convert from the date of issuance to the maturity date, part or all of the May 2019 Convertible Note, inclusive of accrued interest, into the Company's common stock at a variable conversion price that is the lesser of (i) lowest trading price as such term is defined in the May 2019 Convertible Note (the lowest closing bid price) in the twenty five day trading period prior to the date of the May 2019 Convertible Note (which price is now fixed at $0.25, the closing bid price on May 16, 2019), or (ii) the variable conversion price (as defined in the May 2019 Convertible Note) which is 61% of the market price (as defined in the May 2019 Convertible Note). The market price is the lowest trading price (closing bid) in the twenty-five day trading day period up to the day prior to the conversion. If at any time while the May 2019 Convertible Note is outstanding, the conversion price is equal to or lower than $0.35, then an additional eleven percent (11%) discount is to be factored into the conversion price until the May 2019 Convertible Note is no longer outstanding (resulting in a discount rate of 50% assuming no other adjustments are triggered). The lowest trading price on the date of inception of the May 2019 Convertible Note ($0.25) and the lowest market price were both below $0.35, the effective conversion rate on the inception date was $0.125. Therefore, on the inception date, the first tranche would have converted into 400,000 shares of the Company's common stock. The Company evaluated all of the terms of the May 2019 Convertible Note and determined that, in accordance with Accounting Standard Codification (ASC) 815, there were no derivatives to be bifurcated or separately valued. However, there were four features of the May 2019 Convertible Note, the related securities purchase agreement and the warrant that was issued in connection therewith that required valuation. They were: (i) the original issue discount of $5,000, (ii) the debt issuance costs of $2,000, (iii) the beneficial conversion feature and (iv) the value of the warrant. The Company evaluated (iii) the intrinsic value of the beneficial conversion feature for a calculated value of $286,000 (($0.84 closing price minus $0.125 conversion price) x 400,000 shares). The Company calculated the warrant value using the Black-Scholes valuation method, utilizing the following assumptions: (a) exercise price of $1.18 per share, (b) stock price $0.84, (c) three year life (d) three year risk free rate of 2.15% and (e) volatility of 210.19% and determined that the value of one warrant was $0.774 and the total warrant value was $32,796 for the warrant exercisable into 42,373 shares of the Company's common stock, par value $0.001. The amount to be recorded initially as the amount of the May 2019 Convertible Note was then calculated by determining the relative values as percentages of the net proceeds of the May 2019 Convertible Note ($50,000) and the warrant ($32,796). The intrinsic value of the beneficial conversion feature was then calculated based on the value attributed to the May 2019 Convertible Note. The original issue discount, debt issuance costs, the intrinsic value of the beneficial conversion feature and proceeds allocated to the value of the warrant are being amortized to interest expense on a straight-line basis over the life the May 2019 Convertible Note. On December 9, 2019 the holder of the May 2019 Convertible Note converted $4,554 of principal amount into 130,000 shares of the Company's common stock ($0.0408 per share).

The table below provides a summary of the May 2019 Convertible Note as of December 31, 2019.

Principal amount of note payable after payment of $4,554 of principal	$	45,446
Debt discounts, net of amortization of $33,040		(17,181)
Accrued coupon interest		3,108
	$	31,373

On April 24, 2019, the Company issued a convertible note ("the April 2019 Convertible Note") bearing interest at 10% per year. The maturity amount is $58,500 and matures on the one-year anniversary which is April 24, 2020. The Company incurred debt issuance costs of $3,500 for lender legal and due diligence fees. There was no stated original issue discount and no warrants were issued in connection with the April 2019 Convertible Note. The net proceeds to the Company were $55,000. Subject to certain limitations and adjustments as described in the April 2019 Convertible Note, the holder may, from the date that is one hundred eighty (180) days after the issuance to the maturity date, convert part or all of the April 2019 Convertible Note, inclusive of accrued interest, into the Company's common stock at a variable conversion price that is 61% of the market price as defined in the April 2019 Convertible Note. The market price is the lowest trading price, which in turn is the lowest closing bid price in the twenty (20) trading days prior to conversion. The lowest closing bid price in the twenty (20) day period prior to inception was $0.65 which would calculate to a $0.3964 conversion price and further calculate to 147,541 conversion shares to be issued. The Company evaluated all of the terms of the April 2019 Convertible Note and determined that, in accordance with ASC 815, there were no derivatives to be bifurcated or separately valued. However, there were two features of the April 2019 Convertible Note and the related securities purchase agreement that required valuation. They were: (i) the debt issuance costs of $3,500, and (ii) the intrinsic value of the beneficial conversion feature. The Company evaluated (ii) as the closing price on the inception date minus the conversion price multiplied by the number of conversion shares and determined that the beneficial conversion feature had an intrinsic value of $44,950 (($0.701 closing price minus $0.3964 conversion price) x 147,541 shares). The debt issuance costs and the amount recorded as the intrinsic value of the beneficial conversion feature are each being amortized to interest expense on a straight-line basis over the life the April 2019 Convertible Note. On November 12, 2019 the holder of the April 2019 Convertible Note converted $10,000 of principal amount into 81,967 shares of the Company's common stock ($0.1220 per share). On October 28, 2019 the same holder converted $10,000 of principal amount of the April 2019 Convertible Note into 73,529 shares of the Company's common stock ($0.1360 per share). (See Note 10. Subsequent Events).

The table below provides a summary of the April 2019 Convertible Note as of December 31, 2019.

Principal amount of note payable after payment of $20,000 of principal	$	38,500
Debt discounts, net of amortization of $37,762		(10,688)
Accrued coupon interest		4,257
	$	32,069

On January 2, 2019, February 27, 2019, March 6, 2019 and March 14, 2019, the Company issued convertible notes (each a "2019 Q1 Convertible Note and collectively, the "2019 Q1 Convertible Notes") bearing interest at 10% per year. The 2019 Q1 Convertible Notes issued on January 2, 2019 matured on February 28, 2019 with a face amount of $10,000. The 2019 Q1 Convertible Notes issued on February 27, 2019, March 6, 2019 and March 14, 2019 matured on April 30, 2019 with an aggregate face amount of $100,000. Investors who purchased 2019 Q1 Convertible Notes also received an aggregate of 110,000 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 $78,780. Total value received by the investors was $188,780, 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 $45,812 and an initial value of the convertible notes of $64,188 using the relative fair value method. An additional $9,464 of interest expense was recorded based upon the 10% annual rate for the year ended December 31, 2019. As of December 31, 2019, none of the 2019 Q1 Convertible Notes were paid and each remained outstanding and continued to accrue interest. Although the 2019 Q1 Convertible Notes are in default, the Company has not received any notices of default from any of the note holders. The 2019 Q1 Convertible Notes have no reset rights or other protections based on subsequent equity transactions, equity-linked transactions or other events other than the right, but not the obligation, for each investor to convert or exchange his or her 2019 Q1 Convertible Note, but not the warrant, into the next exempt private securities offering. The April 2019 Convertible Note, the May 2019 Convertible Note, the August 2019 Convertible Note, the October 2019 Convertible Note and the November 2019 Convertible Note, which the Company does not consider to have arisen from offerings, may be interpreted in such a way that the 2019 Q1 Convertible Note Holders have the right to convert or exchange. However, no holders of 2019 Q1 Convertible Notes requested a conversion or exchange in connection with the issuance of such notes. The Company does not believe that an offering occurred as of December 31, 2019 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 2019 Q1 Convertible Notes may convert is not determinable and the Company has not accounted for any additional consideration. The warrants to purchase 110,000 shares of common stock issued in connection with the sale of the 2019 Q1 Convertible Notes are exercisable at a fixed price of $1.50 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 Company determined that there were no embedded derivatives to be identified, bifurcated and valued in connection with the 2019 Q1 Convertible Notes.

During December 2018, convertible notes ("2018 Convertible Notes") bearing interest at 10% per year and maturing on February 28, 2019 and warrants were sold to investors with an aggregate face amount of $80,000. Investors also received 80,000 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 $68,025. Total value received by the investors was $148,025, the sum of the face value of the 2018 Convertible Notes and the value of the warrant. Therefore, the Company recorded a debt discount associated with the issuance of the warrants of $36,347 and an initial value of the 2018 Convertible Notes of $43,653 using the relative fair value method. An additional $8,111 and $401 of interest expense was recorded based upon the 10% annual rate for the years ended December 31, 2019 and 2018 respectively. The 2018 Convertible Notes matured on February 28, 2019, were not paid, remain outstanding and continue to accrue interest. Although the 2018 Convertible Notes are in default, the Company has not received any notices of default from any of the note holders. The 2018 Convertible Notes have no reset rights or other protections based on subsequent equity transactions, equity-linked transactions or other events other than the right, but not the obligation for each investor to convert or exchange his or her 2018 Convertible Note, but not the warrant, into the next exempt private securities offering. The May 2019 Convertible Note and April 2019 Convertible Note, which the Company does not consider to have arisen from an offering, may be interpreted in such a way that the 2019 Q1 Convertible Note Holders have the right to convert or exchange. However, no holders of such notes have requested a conversion or exchange. The Company does not believe that an offering occurred as of December 31, 2019 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 2018 Convertible Notes may convert is not determinable and the Company has not accounted for any additional consideration. The warrants to purchase 80,000 shares of common stock issued in connection with the sale of the 2018 Convertible Notes are exercisable at a fixed price of $1.50 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 Company determined that there were no embedded derivatives to be identified, bifurcated and valued in connection with this financing.

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

	December 31, 2019	December 31, 2018
Principal amount of notes payable	$ 190,000	$ 80,000
Discount associated with issuance of warrants net of amortization of $82,159 as of December 31, 2019 and $8,379 as of December 31, 2018	-	(27,968)
Accrued interest payable	17,976	401
	$ 207,976	$ 52,433

Convertible notes were also sold to investors in 2014 and 2015 ("Original Convertible Notes), which aggregated a total of $579,500, had a fixed interest rate of 10% per annum and those that remain outstanding are convertible into common stock at a fixed price of $11.3750 per share. 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 50,945 shares of common stock issued in connection with the sale of the convertible notes have either been exchanged as part of April and May 2016 note and warrant exchange agreements or expired on September 15, 2016.

The maturity date of the Original Convertible Notes was extended to September 15, 2016 and included the issuance of 27,936 additional warrants to purchase common stock, exercisable at $11.375 per share of common stock, which expired on September 15, 2016.

The remaining outstanding Original Convertible Notes (including those for which default notices have been received) consist of the following at December 31, 2019 and December 31, 2018:

	December 31, 2019	December 31, 2018
Principal amount of notes payable	$ 125,000	$ 125,000
Accrued interest payable	82,060	62,233
	$ 207,060	$ 187,233

As of December 31, 2019, 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 $43,666, of which $18,666 was accrued interest. As of December 31, 2018, principal and accrued interest on Original Convertible Notes subject to default notices totaled $38,292 of which $13,292 was accrued interest.

As of December 31, 2019 all of the outstanding Original Convertible Notes, inclusive of accrued interest, were convertible into an aggregate of 18,204 shares of the Company's common stock, including 7,217 shares attributable to accrued interest of $82,060 payable as of such date. As of December 31, 2018, the outstanding Original Convertible Notes were convertible into 16,460 shares of the Company's common stock, including 5,471 shares attributable to accrued interest of $62,233 payable as of such date. 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 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, 2019 and 2018:

	December 31, 2019	December 31, 2018
Principal amount of note payable	$ 399,774	$ 399,774
Accrued interest payable	363,280	315,307
Foreign currency transaction adjustment	3,182	29,360
	$ 766,236	$ 744,441

Interest expense with respect to this promissory note was $47,971 and $47,973 for years ended December 31, 2019 and 2018, 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. In connection with the loans, Dr. Lippa was issued fully vested warrants to purchase 15,464 shares of the Company's common stock, 10,309 of which have an exercise price of $5.1025 per share and 5,155 of which have an exercise price of $4.85 which were the closing prices of the Company's common stock on the respective dates of grant. The warrants expired on January 29, 2019 and September 23, 2019, respectively.

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. In connection with the loans, Dr. Manuso was issued fully vested warrants to purchase 13,092 shares of the Company's common stock, 8,092 of which have an exercise price of $6.50 per share and 5,000 of which have an exercise price of $5.00, which were the closing market prices of the Company's common stock on the respective dates of grant. The warrants expired on February 2, 2019 and September 22, 2019, respectively.

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, 2019, Dr. James S. Manuso had not exchanged his note.

During the year ended December 31, 2019, Dr. Lippa advanced on an interest free basis the Company $38,000 of which $13,000 was repaid to Dr. Lippa. The outstanding balance of the advance is payable on demand.

During the year ended December 31, 2019, the Company repaid $1,000 to Jeff Margolis related to $6,500 of interest free advances Mr. Margolis made to the Company during the year ended December 2018. The outstanding balance of the advance is payable on demand.

For the fiscal years ended December 31, 2019 and 2018, $10,272 and $11,268 was charged to interest expense with respect to Dr. Lippa's notes, respectively.

For the fiscal years ended December 31, 2019 and 2018, $15,416 and $12,769 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 2019 was incurred while Dr. Manuso was no longer an officer. With respect to the year ended December 31, 2019, of the $12,769 of interest expense noted above, $3,564 was incurred while Dr. Manuso was no longer an officer.

Other Short-Term Notes Payable

Other short-term notes payable at December 31, 2019 and December 31, 2018 consisted of premium financing agreements with respect to various insurance policies. At December 31, 2019, a premium financing agreement was payable in the initial amount of $61,746, with interest at 9% per annum, in ten monthly installments of $7,120, and another premium financing arrangement was payable in the initial amount of $9,322 payable in equal quarterly installments. At December 31, 2019 and 2018, the aggregate amount of the short-term notes payable was $4,635 and $8,907 respectively.

5. Settlement and Payment Agreements

On December 16, 2019, RespireRx and Salamandra, LLC ("Salamandra") entered into an amendment (the "Amendment") to the settlement agreement and release, executed August 21, 2019 (the "Original Settlement Agreement" and as amended, the "Amended 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 an arbitration award previously granted in favor of Salamandra in the Superior Court of New Jersey. Under the terms of the Original Settlement Agreement, the Company was to pay Salamandra $125,000 on or before November 30, 2019 in full satisfaction of the Full Amount owed, subject to conditions regarding the Company's ability to raise certain dollar amounts of working capital. Under the Amended Settlement Agreement, (i) the Company must pay and the Company paid to Salamandra $25,000 on or before December 21, 2019, (ii) upon such payment, Salamandra ceased all collection efforts against the Company until March 31, 2020 (the "Threshold Date"), and (iii) the Company must pay to Salamandra $100,000 on or before the Threshold Date if the Company has at that time raised $600,000 in working capital. Such payments by the Company would constitute satisfaction of the Full Amount owed and would serve as consideration for the dismissal of the action underlying the arbitration award and the mutual releases set forth in the Amended Settlement Agreement. If the Company raises less than $600,000 in working capital before the Threshold Date, the Company may pay to Salamandra an amount equal to 21% of the working capital amount raised, in which case such payment will reduce the Full Amount owed on a dollar-for-dollar basis, and Salamandra may then seek collection on the remainder of the debt. The Company did not make the requirement payment on March 31, 2020 and has initiated further discussions with the intent of reaching a revised settlement agreement which cannot be assured.

In February 2020, the Company and a vendor agreed to discuss amendments to an agreement in principal reached on September 23, 2019, whereby the Company and a vendor agreed in principle to a proposed settlement agreement, which has not resulted in a formal agreement. The discussions included, among other things, an extension of time to raise the amount discussed below. The September 23, 2019 agreement in principal calls for no reduction in the overall amount to be paid by the Company, which amount is not in dispute, but addresses only a payment schedule. The agreement in principal calls for a payment of a minimum of $100,000 on or before November 30, 2019 assuming the Company has raised at least $600,000 by that date and thereafter calls for a payment of $50,000 per month until paid in full. If the Company does not make a scheduled payment, the agreement in principal would be deemed null and void.

On April 5, 2018, the Company issued 185,388 common stock purchase options to Robert N. Weingarten, the Company's former Chief Financial Officer and 125,000 common stock purchase options to Pharmaland Executive Consulting Services LLC ("Pharmaland") exercisable until April 5, 2023 at $1.12 per share of common stock, which was the closing price of the common stock as quoted on the OTC QB on that date. All of these common stock purchase options vested immediately. Each of the common stock purchase options were valued on the issuance date based upon a Black-Scholes valuation method at $1.081. Mr. Weingarten simultaneously with the issuance of the common stock purchase options, agreed to forgive $200,350 of accrued compensation owed to him. The value of the options granted to Mr. Weingarten was $200,404. The resulting loss on extinguishment of the accrued liability was $54. The common stock purchase options issued to Pharmaland was in partial payment of accounts payable owed. The common stock purchase options issued to Pharmaland had a value of $135,125 and the accounts payable extinguished was $124,025. The loss on extinguishment of this accounts payable was $11,100.

On November 21, 2018, the Company issued 283,643 shares of common stock with a value of $198,550 to designees of one of its intellectual property law firms as partial settlement of accounts payable due to the law firm. There was no gain or loss on the settlement of this accounts payable.

On November 21, 2018, the Company granted a non-qualified stock option ("NQSO") to purchase 21,677 shares of common stock to a vendor to settle $15,000 of accounts payable due to that vendor. The NQSO vested immediately with respect to 14,452 shares of common stock and on November 30, 2018 with respect to an additional 7,225 shares of common stock. As of December 31, 2018, the NQSO has vested with respect to all shares. The NQSO has a term of 5 years and have an exercise price of $0.70 per share, which was the closing price on the trading day of the grant date. The NQSO was valued using the Black-Scholes option pricing model resulting value was $0.692 per NQSO. There was no gain or loss on the extinguishment of the accounts payable.

The Company continues to explore ways to reduce its obligations and indebtedness and might in the future enter into additional settlement and payment agreements.

6. Stockholders' Deficiency

Preferred Stock

The Company has authorized a total of 5,000,000 shares of preferred stock, par value $0.001 per share. As of December 31, 2019 and 2018, 1,250,000 shares were designated as 9% Cumulative Convertible Preferred Stock (non-voting, "9% 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 (non-voting, "Series A Junior Participating Preferred Stock"); and 1,700 shares were designated as Series G 1.5% Convertible Preferred Stock. Accordingly, as of December 31, 2019, 3,505,800 shares of preferred stock were undesignated and may be issued with such rights and powers as the Board of Directors may designate.

There were no shares of 9% Preferred Stock or Series A Junior Participating Preferred Stock or Series G 1.5% Convertible Preferred Stock outstanding as of December 31, 2019 and 2018.

Series B Preferred Stock outstanding as of December 31, 2019 and 2018 consisted of 37,500 shares issued in a May 1991 private placement. Each share of Series B Preferred Stock is convertible into approximately 0.00030 shares of common stock at an effective conversion price of $2,208.375 per share of common stock, which is subject to adjustment under certain circumstances. As of December 31, 2019 and 2018, the shares of Series B Preferred Stock outstanding are convertible into 11 shares of common stock. The Company 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 4,175,072 shares of the Company's Common Stock outstanding as of December 31, 2019. After reserving for conversions of convertible debt as well as common stock purchase options and warrants exercises, there were 42,831,291 shares of the Company's Common Stock available for future issuances as of December 31, 2019. After accounting for excess reserves required by the April 2019 Convertible Note, the May 2019 Convertible Note, the August 2019 Convertible Note, the October 2019 Convertible Note and the November 2019 Convertible Note, there were 3,438,021 available for future issuances as of December 31, 2019. Each conversion of such 2019 Convertible Notes reduces the excess reserve requirements.

2018 Unit Offering

On September 12, 2018, the Company consummated an initial closing on an offering ("2018 Unit Offering") of Units comprised of one share of the Company's common stock and one common stock purchase warrant. The 2018 Unit Offering was for up to $1.5 million and had a final termination date of October 15, 2018. The initial closing was for $250,750 of which $200,750 was the gross cash proceeds. The additional $50,000 was represented by the conversion into the 2018 Unit Offering of the principal amount of the Arnold S. Lippa, Demand Promissory Note described below. With the exchange of Dr. Lippa's Demand Promissory Note into the 2018 Unit Offering, 47,620 warrants exercisable at 150% of the unit price ($1.575) per share of common stock and expiring on April 30, 2023 were issued with a value of $49,975 which amount was considered a loss on the extinguishment of that officer note and which amount was credited to additional paid-in capital. Units were sold for $1.05 per unit and the warrants issued in connection with the units are exercisable through April 30, 2023 at a fixed price of 150% of the unit purchase price. The warrants contain a cashless exercise provision and certain blocker provisions preventing exercise if the investor would beneficially own more than 4.99% of the Company's outstanding shares of common stock as a result of such exercise. The warrants are also subject to redemption by the Company at $0.001 per share upon ten (10) days written notice if the Company's common stock closes at $3.00 or more for any five (5) consecutive trading days. In total, 238,814 shares of the Company's common stock and 238,814 common stock purchase warrants were purchased. Other than Arnold S. Lippa, the investors in the offering were not affiliates of the Company. Investors also received an unlimited number of piggy-back registration rights in respect to the shares of common stock and the shares of common stock underlying the common stock purchase warrants, unless such common stock is eligible to be sold with volume limits under an exemption from registration under any rule or regulation of the SEC that permits the holder to sell securities of the Company to the public without registration and without volume limits (assuming the holder is not an affiliate).

The shares of common stock and common stock purchase warrants were offered and sold without registration under the Securities Act of 1933, as amended (the "Securities Act") in reliance on the exemptions provided by Section 4(a)(2) of the Securities Act as provided in Rule 506(b) of Regulation D promulgated thereunder. None of the shares of common stock issued as part of the units, the common stock purchase warrants, the Common Stock issuable upon exercise of the common stock purchase warrants or any warrants issued to a qualified referral source (of which there were none in the initial closing) have been registered under the Securities Act or any other applicable securities laws, and unless so registered, may not be offered or sold in the United States except pursuant to an exemption from the registration requirements of the Securities Act.

In addition, as set forth in the Purchase Agreements, each Purchaser had an unlimited number of exchange rights, which were options and not obligations, to exchange such Purchaser's entire investment as defined (but not less than the entire investment) into one or more subsequent equity financings (consisting solely of convertible preferred stock or common stock or units containing preferred stock or common stock and warrants exercisable only into preferred stock or common stock) that would be considered as "permanent equity" under United States Generally Accepted Accounting Principles and the rules and regulations of the United States Securities and Exchange Commission, and therefore classified within stockholders' equity, and excluding any form of debt or convertible debt or preferred stock redeemable at the discretion of the holder (each such financing a "Subsequent Equity Financing"). The exchange rights expired on December 31, 2018.

Common Stock Warrants

In October 2019, the Company issued a warrant to purchase 175,000 shares of common stock in conjunction with the issuance of the October 2019 Convertible Note exercisable at $0.50 per share and expiring on October 22, 2024.

In August 2019, the Company issued a warrant to purchase 150,000 shares of common stock in conjunction with the issuance of the August 2019 Convertible Note exercisable at $0.50 per share and expiring on August 19, 2024.

In May 2019, the Company issued a warrant to purchase 42,372 shares of common stock in conjunction with the issuance of the May 2019 Convertible Note exercisable at $1.18 per share and expiring on May 17, 2022.

In January 2019, February 2019 and March 2019, the Company issued warrants to purchase 110,000 shares of common stock in conjunction with the issuance of the 2019 Q1 Convertible Notes exercisable at $1.50 per share and expiring on December 30, 2023.

During the year ended December 31, 2019, warrants to purchase 69,558 shares of common stock expired.

In December 2018, the Company issued warrants to purchase 80,000 of common stock in conjunction with the issuance of the December 2018 10% Convertible Notes exercisable at $1.50 per share and expiring on December 30, 2023.

Although not considered stock-based compensation, the Company issued a warrant to purchase 47,620 shares of common stock at an exercise price of $1.50 per share and expiring on December 30, 2023 as part of an officer note exchange into the 2018 Unit Offering. The warrants were valued at $49,925 as of September 12, 2018, the date of issuance and were accounted for in Additional paid-in capital as of December 31, 2018.

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	1,783,229	$ 2.20393	3.06
Issued	477,372	0.79079	4.36
Expired	(69,558)	2.98989	-
Warrants outstanding at December 31, 2019	2,191,043	$ 1.87109	3.44
Warrants exercisable at December 31, 2018	1,783,229	$ 2.20393	3.06
Warrants exercisable at December 31, 2019	2,191,043	$ 1.87109	3.44

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

Exercise Price	Warrants Outstanding (Shares)	Warrants Exercisable (Shares)	Expiration Date
$ 0.5000	175,000	175,000	October 22, 2024
$ 0.5000	150,000	150,000	August 19, 2024
$ 1.0000	916,217	916,217	September 20, 2022
$ 1.1800	42,372	42,372	May 17, 2022
$ 1.5000	190,000	190,000	December 30, 2023
$ 1.5620	130,284	130,284	December 31, 2021
$ 1.5750	238,814	238,814	April 30, 2023
$ 2.7500	8,000	8000	September 20, 2022
$ 4.8750	108,594	108,594	September 30, 2020
$ 6.8348	145,758	145,758	September 30, 2020
$ 7.9300	86,004	86,004	February 28, 2021
	2,191,043	2,191,043	

Based on a fair value of $0.10 per share on December 31, 2019, there were no exercisable in-the money common stock warrants as of December 31, 2019.

A summary of warrant activity for the year ended December 31, 2018 is presented below.

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (in Years)
Warrants outstanding at December 31, 2017	1,464,415	$ 2.68146	3.73
Issued	318,814	1.55618	4.50
Warrants outstanding at December 31, 2018	1,783,229	$ 2.20393	3.06
Warrants exercisable at December 31, 2017	1,464,415	$ 2,68146	3.73
Warrants exercisable at December 31, 2018	1,783,229	$ 2.20393	3.06

Stock Options

On March 18, 2014, the stockholders of the Company holding a majority of the votes to be cast on the issue approved the adoption of the Company's 2014 Equity, Equity-Linked and Equity Derivative Incentive Plan (the "2014 Plan"), which had been previously adopted by the Board of Directors of the Company, subject to stockholder approval. 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 (the "2015 Plan"). The 2015 Plan initially provided for, among other things, the issuance of either or any combination of restricted shares of common stock and non-qualified stock options to purchase up to 461,538 shares of the Company's common stock for periods up to ten years to management, members of the Board of Directors, consultants and advisors. The Company has not and does not intend to present the 2015 Plan to stockholders for approval. On December 28, 2018, the Board of Directors further increased the number of shares that may be issued under the 2015 Plan to 8,985,260 shares of the Company's common stock.

During fiscal year ended December 31, 2018, there were three grants of options to purchase an aggregate of 348,827 shares of the Company's common stock to a vendor. The value of these options on the grant date was approximately equal to the amount payable to the vendor that was to be paid with the options. The cumulative loss on extinguishment of three liabilities totaling $353,623 was $11,154. The remaining amount payable to the vendor is due in cash.

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.

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	4,344,994	$ 3.5414	5.90
Expired	(57,385)	15.6139	-
Options outstanding at December 31, 2019	4,287,609	$ 3.3798	4.98
Options exercisable at December 31, 2018	4,344,994	$ 3.5414	5.90
Options exercisable at December 31, 2019	4,287,609	$ 3.3789	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
$ 0.7000	21,677	21,677	November 21, 2023
$ 1.1200	310,388	310,388	April 5, 2023
$ 1.2500	16,762	16,762	December 7, 2022
$ 1.3500	34,000	34,000	July 28, 2022
$ 1.4500	1,849,418	1,849,418	December 9, 2027
$ 1.4500	100,000	100,000	December 9, 2027
$ 2.0000	285,000	285,000	June 30, 2022
$ 2.0000	25,000	25,000	July 26, 2022
$ 3.9000	395,000	395,000	January 17, 2022
$ 4.5000	7,222	7,222	September 2, 2021
$ 5.6875	89,686	89,686	June 30, 2020
$ 5.7500	2,608	2,608	September 12, 2021
$ 6.4025	27,692	27,692	August 18, 2020
$ 6.4025	129,231	129,231	August 18, 2022
$ 6.4025	261,789	261,789	August 18, 2025
$ 6.8250	8,791	8,791	December 11, 2020
$ 7.3775	523,077	523,077	March 31, 2021
$ 8.1250	169,231	169,231	June 30, 2022
$ 13.9750	3,385	3,385	March 14, 2024
$ 15.4700	7,755	7,755	April 8, 2020
$ 15.9250	2,462	2,462	February 28, 2024
$ 16.6400	1,538	1,538	January 29, 2020
$ 19.5000	9,487	9,487	July 17, 2022
$ 19.5000	6,410	6,410	August 10, 2022
	4,287,609	4,287,609	

There was no deferred compensation expense for the outstanding and unvested stock options at December 31, 2019.

Based on a fair value of $0.10 per share on December 31, 2019, there were no exercisable in-the-money common stock options as of December 31, 2019.

A summary of stock option activity for the year ended December 31, 2018 is presented below.

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (in Years)
Options outstanding at December 31, 2017	3,996,167	$ 3.7634	6.30
Granted	348,827	1.1002	4.29
Options outstanding at December 31, 2018	4,344,994	$ 3.5414	5.90
Options exercisable at December 31, 2017	3,996,167	$ 3.7634	6.30
Options exercisable at December 31, 2018	4,344,994	$ 3.5414	5.90

The exercise prices of common stock options outstanding and exercisable were as follows at December 31, 2018:

Exercise Price	Options Outstanding (Shares)	Options Exercisable (Shares)	Expiration Date
$ 0.7000	21,677	21,677	November 21, 2023
$ 1.1200	310,388	310,388	April 5, 2023
$ 1.2500	16,762	16,762	December 7, 2022
$ 1.3500	34,000	34,000	July 28, 2022
$ 1.4500	1,849,418	1,849,418	December 9, 2027
$ 1.4500	100,000	100,000	December 9, 2027
$ 2.0000	285,000	285,000	June 30, 2022
$ 2.0000	25,000	25,000	July 26, 2022
$ 3.9000	395,000	395,000	January 17, 2022
$ 4.5000	7,222	7,222	September 2, 2021
$ 5.6875	89,686	89,686	June 30, 2020
$ 5.7500	2,608	2,608	September 12, 2021
$ 6.4025	27,692	27,692	August 18, 2020
$ 6.4025	129,231	129,231	August 18, 2022
$ 6.4025	261,789	261,789	August 18, 2025
$ 6.8250	8,791	8,791	December 11, 2020
$ 7.3775	523,077	523,077	March 31, 2021
$ 8.1250	169,231	169,231	June 30, 2022
$ 13.0000	7,385	7,385	March 13, 2019
$ 13.0000	3,846	3,846	April 14, 2019
$ 13.9750	3,385	3,385	March 14, 2024
$ 15.4700	7,755	7,755	April 8, 2020
$ 15.9250	2,462	2,462	February 28, 2024
$ 16.0500	46,154	46,154	July 17, 2019
$ 16.6400	1,538	1,538	January 29, 2020
$ 19.5000	9,487	9,487	July 17, 2022
$ 19.5000	6,410	6,410	August 10, 2022
	4,344,994	4,344,994	

There was no deferred compensation expense for the outstanding and unvested stock options at December 31, 2018.

Based on a fair value of $0.65 per share on December 31, 2018, there were no exercisable in-the-money common stock options as of December 31, 2018.

For the years ended December 31, 2019 and 2018, stock-based compensation costs and fees included in the consolidated statements of operations consisted of general and administrative expenses of $0 and $14,248 respectively, and research and development expenses of $0 and $15,000, respectively.

Pier Contingent Stock Consideration

In connection with the merger transaction with Pier effective August 10, 2012, RespireRx issued 179,747 newly issued shares of its common stock with an aggregate fair value of $3,271,402 ($18.2000 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 443,205 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, 2019. 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 increases the shares issuable under the plan by 1,500,000, from 1,538,461 to 3,038,461. 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 6,985,260 and 8,985,260 shares of the Company's common stock.

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, 2019, the Company had 65,000,000 shares of common stock authorized and 4,175,072 shares of common stock issued and outstanding. The Company has reserved 11 shares of common stock for the conversion of the Series B Preferred Stock. The Company has reserved an aggregate of 7,035,706 for the calculated amount of shares of common stock into which convertible notes may convert and an additional 39,375,462 shares of common stock for contractual reserves. In addition, The Company has reserved 6,478,652 shares of the Company's common stock for exercises of common stock purchase options granted and warrants issued. There are 4,490,578 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 and contingent share issuances, there were 42,813,484 shares of the Company's common stock available for future issuances as of December 31, 2019. After accounting for additional contractual reserves, which amount declines with each actual conversion, there are 3,438,022 shares of the Company's common stock available for future issuances as of December 31, 2019. The Company has taken steps to increase the number of authorized shares. See Note 10. Subsequent Events. The Company expects to satisfy its future common stock commitments through the issuance of authorized but unissued shares of common stock.

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, 2019 and 2018 are summarized below.

	December 31,	
	2019	**2018**
Capitalized research and development costs	$ -	$ 183,000
Research and development credits	3,017,000	3,017,000
Stock-based compensation	3,787,000	3,787,000
Stock options issued in connection with the payment of debt	202,000	202,000
Net operating loss carryforwards	19,982,000	20,424,000
Accrued compensation	586,000	367,000
Accrued interest due to related party	217,000	103,000
Other, net	8,000	8,000
Total deferred tax assets	27,799,000	28,091,000
Valuation allowance	(27,799,000)	(28,091,000)
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, 2019 and 2018, 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, 2019 and 2018 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, 2019 and 2018.

	Years Ended December 31,	
	2019	2018
U. S. federal statutory tax rate	(21.0)%	(21.0)%
Forgiveness of indebtedness	-%	-%
Change in valuation allowance	(1.0)%	(14.4)%
Adjustment to deferred tax asset	22.0%	35.4%
Other	-%	-%
Effective tax rate	0.0%	0.0%

As of December 31, 2019, the Company had federal and state tax net operating loss carryforwards of approximately $102,216,000 and $46,645,000, respectively. The state tax net operating loss carryforward consists of $19,673,000 for California purposes and $26,972,000 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 2020 through 2039. State net operating losses expire at various dates from 2020 through 2029 for California and through 2039 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, 2019. The federal research and development tax credit carryforwards will expire at various dates from 2020 through 2031. 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 did not file its federal or state tax returns for the year ended December 31, 2017 or 2018 and has not yet filed such returns for the year ended December 31, 2019. 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 is also a full-service brokerage firm.

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

Dr. James S. Manuso resigned as the Company's President and Chief Executive Officer as well as Vice Chairman and member of the Board of Directors effective as of September 30, 2018. Having been the principal executive officer of the Company during the fiscal year ended December 31, 2018, Dr. Manuso is considered a named executive officer for the year ended December 31, 2018, but not for the year ended December 31, 2019. Dr. Manuso remains an affiliate due to his equity ownership and option grants.

9. Commitments and Contingencies

Pending or Threatened Legal Action and Claims

On March 10, 2020, Sharp Clinical Services, Inc. filed a complaint and summons dated February 21, 2020 in Superior Court of New Jersey Law Division, Bergen County against the Company related to a December 16, 2019 demand for payment of past due invoices inclusive of late fees totaling $103,890 of which $3,631 relates to late fees. The complaint and summons seeks $100,259 plus 1.5% interest per month on outstanding unpaid invoices. On Friday On Friday March 13, 2020, the RespireRx and its counsel communicated with counsel to this vendor and discussed why a settlement of such matter would be in the best interests of both parties, but has not yet received a response from this vendor or it's counsel. As of December 31, 2019, the Company had recorded accounts payable of $99,959 to such vendor an amount considered by the Company to be reasonable given the ongoing settlement discussions.

By letter dated May 18, 2018, the Company received notice from counsel claiming to represent TEC Edmonton and The Governors of the University of Alberta, which purports to terminate, effective December 12, 2017, the license agreement dated May 9, 2007 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, 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, SCI, FXS and others.

By e-mail 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, 2019 and 2018.

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, 2019 and 2018 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. See Note 5. Settlement and Payment Agreements for additional items and details.

Significant Agreements and Contracts

Consulting Agreement

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. Additional information with respect to shares of common stock that have been issued to Mr. Purcell is provided at Note 6. Cash compensation expense pursuant to this agreement totaled $150,000 for the fiscal years ended December 31, 2019 and 2018, which is included in research and development expenses in the Company's consolidated statements of operations for such periods.

Employment Agreements

Employment Agreements

On October 12, 2018, after the resignation of Dr. James Manuso effective September 30, 2018, Dr. Lippa was named Interim President and Interim Chief Executive Officer (see Note 9 to the Company's consolidated financial statements for the fiscal years ended December 31, 2019 and 2018). 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 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), 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 occassions 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, 2019. 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, 2019 and 2018. Cash compensation inclusive of employee benefits accrued pursuant to this agreement totaled $339,600 for each of the fiscal years ended December 31, 2019 and 2018, respectively, which amounts are included in accrued compensation and related expenses in the Company's consolidated balance sheet at December 31, 2019 and 2018, and in research and development expenses in the Company's consolidated statement of operations for the fiscal years ended December 31, 2019 and 2018. Dr. Lippa does not receive any additional compensation for serving as Executive Chairman and on the Board of Directors.

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, 2019 and 2018. Recurring cash compensation accrued pursuant to this amended agreement totaled $321,600 for the fiscal year ended December 31, 2019 and 2018 which amounts are included in accrued compensation and related expenses in the Company's consolidated balance sheet December 31, 2019 and 2018, and in general and administrative expenses in the Company's consolidated statement of operations.

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.

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, 2019, was extended to June 30, 2020. 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, 2019 and 2018, the Company recorded charges to operations of $100,000, respectively, with respect to its 2019 and 2018 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, 2019 and 2018. The Company did not pay the amount due on December 31, 2019 for which the Company was granted an extension until June 30, 2020.

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, 2019, aggregating $995,900. Employment agreement amounts included in the 2020 column represent amounts contractually due at from January 1, 2020 through September 30, 2020 when such contracts expire unless extended pursuant to the terms of the contracts.

		Payments Due By Year				
	Total	2020	2021	2022	2023	2024
License agreements	$ 500,000	$100,000	$100,000	$100,000	$100,000	$100,000
Employment agreements (1)	495,900	495,900	-	-	-	-
Total	$ 995,900	$595,900	$100,000	$100,000	$100,000	$100,000

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

10. Subsequent Events

On March 10, 2020, RespireRx was served a complaint and summons dated February 21, 2020 related to a December 16, 2019 demand for payment of past due invoices inclusive of late fees totaling $103,890 of which $3,631 relates to late fees which seeks $100,259 plus 1.5% interest per month on outstanding unpaid invoices. On Friday March 13, 2020, RespireRx and its counsel communicated with vendor's counsel and discussed why a settlement of such matter would be in the best interests of both parties. As of December 31, 2019, the Company had recorded accounts payable of $99,959 to such vendor an amount considered by the Company to be reasonable given the ongoing settlement discussions.

The due date of the $100,000 annual amount payable to the University of Illinois that was originally due on December 31, 2019 pursuant to the 2014 License Agreement, was extended to June 30, 2020.

On March 2, 2020, RespireRx and UWM Research Foundation, an affiliate of the University of Wisconsin-Milwaukee, entered into an option agreement ("UWMRF Option Agreement") pursuant to which RespireRx has a six-month option to license the identified intellectual property pursuant to license terms substantially in the Form of a Patent License Agreement ("UWMRF License Agreement") that is attached to the UWMRF Option Agreement as Appendix I. The UWMRF License Agreement, if it becomes effective, will expand the Company's neuromodulator program which has historically included the Company's ampakine program to include a GABA-A program as well.

On March 20, 2020, the holder of the August 2019 Convertible Note converted $1,000 of principal and $866 of reimbursable costs into 200,000 shares of the Company's common stock. On March 16, 2020 the same holder converted $1,000 principal amount and $866 of reimbursable conversion costs into 200,000 shares of the Company's common stock. On February 24, 2020 the same holder converted $6,150 principal amount and $1,200 of reimbursable costs into 175,000 shares of the Company's common stock. There remains $46,850 of principal amount plus accrued interest due on the August 2019 Convertible Note (See Note 4. Notes Payable – *Convertible Notes Payable*).

On March 20, 2020, the holder of the May 2019 Convertible Note converted $493 of principal and $750 of reimbursable costs into 259,000 shares of the Company's common stock. There remains $44,953 of principal amount plus accrued interest due on the May 2019 Convertible Note. (See Note 4. Notes Payable – *Convertible Notes Payable*).

On March 26, 2020 the holder of the April 2019 Convertible Note converted $5,600 principal amount and $3,510 of interest into 1,247,945 shares of the Company's common stock which resulted in the full repayment of all amounts owed pursuant to the April 2019 Convertible Note. On March 24, 2020 and March 20, 2019, the holder of the April 2019 Convertible Note converted $1,800 principal amount on each date into 246,575 shares of the Company's common stock on each date. Similarly, on March 19, 2020 the holder of the April 2019 Convertible Note converted $1,800 principal amount into 246,575 shares of the Company's common stock. On January 6, 2020, February 18, 2020 and March 4, 2020 the holder of the April 2019 Convertible Note converted $9,800, $9,400 and $8,300 respectively, of principal amount into 200,820, 217,090 and 226,776 shares of the Company's common stock respectively. There remains no principal amount or accrued interest due on the April 2019 Convertible Note. (See Note 4. Notes Payable – *Convertible Notes Payable*).

On March 21, 2020, the Company entered into five separately negotiated Exchange Agreements (each an "Exchange Agreement" and collectively, the "Exchange Agreements") with certain existing holders (the "Noteholders") of Convertible Promissory Notes of the Company (the "Notes"). On March 22, 2020 (the "Closing Date"), each Noteholder exchanged his, her or its Note or Notes for shares of common stock of the Company as contemplated by the respective Exchange Agreement. The Noteholders were issued the Notes by the Company on one or more of the following dates: December 31, 2014, December 6, 2018, December 7, 2018, February 27, 2019, March 6, 2019 and March 14, 2019. Under the Exchange Agreements, an aggregate of $255,786.37 principal amount and accrued interest with respect to the Notes were exchanged and cancelled in return for an aggregate of 17,052,424 shares of Common Stock.

On March 21, 2020, two directors and officers of the Company, agreed to forgive a portion of the accrued but unpaid compensation to which each was entitled pursuant to his employment agreement with the Company, equal to $153,000 each. On March 22, 2020, the Company issued to each of them 4,500,000 shares of Common Stock in exchange for this forgiveness, which equates to a per share value of $0.034 per share, the closing share price of Common Stock on Friday, March 20, 2020, the last business day prior to the transaction.

Under the terms of the April 2019 Convertible Note, the May 2019 Convertible Note, the August 2019 Convertible Note, the October 2019 Convertible Note and the November 2019 Convertible Note (each a "Subsequent Note" and collectively, the "Subsequent Notes"), the Company is subject to covenants to maintain a number of reserved shares of common stock with respect to these Subsequent Notes. The reserve requirement is generally a multiple of the number of shares of common stock that would be issued if there were a conversion pursuant to the terms of the applicable Subsequent Note. A breach by the Company of these covenants is an event of default under the terms of the April, August and October Subsequent Notes that generally increases the applicable note's principal amount and interest rate, and accelerates its maturity date, making the debt immediately due and payable. For the May Subsequent Note, the provisions are similar, but a notice of default is required before such increases and acceleration. For the November Subsequent Note, an event of default will only occur if the holder requests replenishment of the reserves, and that request is not met within three days or a subsequent five-day cure period. The holder of the November Subsequent Note has not yet made such request. (See Note 4. Notes Payable – *Convertible Notes Payable*).

On March 21 and 22, 2020, the board of directors of Company approved, and on March 22, 2020 the holders of a majority of the outstanding shares of the Company's common stock executed written consents approving a Certificate of Amendment to the Company's Certificate of Incorporation. When filed with the Secretary of State of Delaware, the Certificate of Amendment will increase the number of authorized shares of Common Stock of the Company from 65,000,000 to 1,000,000,000. The Company as required, filed a Form DEF 14C Information Statement with the Securities and Exchange Commission. The filing was made on April 10, 2020. The Company is required to provide (generally by mail), the DEF 14C to its shareholders who did not consent to the action. Twenty days after the commencement of the distribution of the Form DEF 14C, the Company is eligible to file the Certificate of Amendment with the Secretary of State of Delaware. The Company has taken this action primarily to increase the number of authorized shares available and to bring it back into compliance with the covenants in the Subsequent Notes regarding the required number of reserved shares of common stock. As described above, the outstanding principal of certain of the Subsequent Notes has been reduced as the holders of these notes have converted a portion of the outstanding principal in exchange for Common Shares, pursuant to the term of the applicable Subsequent Note. With respect to those Subsequent Notes for which conversions have occurred, interest continues to accrue based upon the reduced principal amount of the relevant Subsequent Note. The Company has received waivers of the reserve requirements from several of the Subsequent Note holders until April 30, 2020. The Company is in discussions with the relevant remaining holders of the Subsequent Notes with respect to this recent action, seeking waivers regarding the technical breach of the reserve provisions until such time as the increase in authorized shares is effective, which the Company currently expects will be on or about April 30, 2020, at which time the Company expects that the number of reserved shares will again be in compliance with the applicable covenants.

Dr. Lippa and Mr. Margolis have made advances to the Company on April 13, 2020 totaling $18,500 in the aggregate, which funds were utilized to make a payment of $18,000 to the Company's auditors.

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).
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.
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 14, 2020

By: */s/ Arnold S. Lippa, Ph.D.*
Arnold S. Lippa
Interim President, Interim Chief Executive Officer, Chief Scientific Officer, Director and Executive Chairman of the Board

We, the undersigned directors and officers of RespireRx Pharmaceuticals Inc., do hereby constitute and appoint each of Arnold S. Lippa, Ph.D., 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/ Arnold S. Lippa, Ph.D. Arnold S. Lippa, Ph.D.	Interim President, Interim Chief Executive Officer, Chief Scientific Officer, Director and Executive Chairman of the Board	April 14, 2020
/s/ Jeff E. Margolis Jeff E. Margolis	Senior Vice President, Chief Financial Officer, Treasurer, Secretary, and Director	April 14, 2020
/s/ Timothy Jones Timothy Jones	Director	April 14, 2020
/s/ Kathryn MacFarlane Kathryn MacFarlane	Director	April 14, 2020

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 70,000,000 shares of capital stock, with a par value of $0.001 per share. Of the authorized amount, 65,000,000 of the shares are designated as common stock and 5,000,000 of the shares are designated as preferred stock. The Company's board of directors (the "Board") and a majority of stockholders acting by written consent have recently approved an amendment to the Certificate of Incorporation that would increase the number of authorized shares to 1,005,000,000, with 1,000,000,000 of the shares designated as common stock and 5,000,000 of the shares designated as preferred stock. The Company has circulated an Information Statement regarding these approvals and intends to file a certificate of amendment effecting such increase on or about April 30, 2020, after the waiting period in connection with the Information Statement has run. The Company's common stock is registered under Section 12(g) of the Securities Exchange Act of 1934 (the "Act"). No other security of the Company is registered under Section 12 of the Act.

As of December 31, 2019, there were 4,175,072 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 OTC QB, 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, 2019, the Company's authorized shares of preferred stock are designated into series as follows: 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 B Preferred Stock. As of December 31, 2019, 37,500 shares of Series B Preferred Stock are issued and outstanding. Each share of Series B Preferred Stock is convertible into approximately 0.00030 shares of common stock at an effective conversion price of $2,208.375 per share of common stock, which is subject to adjustment under certain circumstances. As of December 31, 2019, the shares of Series B Preferred Stock outstanding are convertible into 11 shares 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, 2019, 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 $0.0033. 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, 2019, 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 303,030 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, 2019, 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 split effected by the Company on September 1, 2016, whereby each 325 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, 2019, 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 the 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.

The 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 REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the Registration Statements (No. 333-161143, No. 333-155749, No. 333-122026, No. 333-112043, and No. 333-108948) on Form S-3 of RespireRx Pharmaceuticals Inc. (the "Company"), and in the related Prospectuses and in the Registration Statements (No. 333-211441, No. 333-143374, No. 333-134490, No. 333-102042, No. 333-82477, No. 333-20777 and No. 333-208017) on Form S-8 and pertaining to the 2015 Stock Incentive Plans, of our report dated April 14, 2020 relating to our audit of the Company's consolidated financial statements as of December 31, 2019 and 2018, 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, 2019.

Our report dated April 14, 2020 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 14, 2020

EXHIBIT 31.1

CERTIFICATION

I, Arnold S. Lippa, Ph.D., 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 14, 2020

/s/ Arnold S. Lippa, Ph.D.

Arnold S. Lippa, Ph.D.
Interim President, Interim Chief Executive Officer, Chief Scientific Officer, Director and Executive Chairman of the Board

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 14, 2020

/s/ Jeff E. Margolis

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

EXHIBIT 32

CERTIFICATION

Arnold S. Lippa, Ph.D., Interim President, Interim Chief Executive Officer, Chief Scientific Officer, Director and Executive Chairman of the Board of RespireRx Pharmaceuticals Inc. (the "Company"), and Jeff E. Margolis, Senior Vice President, Chief Financial Officer, Treasurer and Secretary 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, 2019 (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 14, 2020

/s/ Arnold S. Lippa, Ph.D.

Arnold S. Lippa, Ph.D.
Interim President, Interim Chief Executive Officer, Chief Scientific Officer, Director and Executive Chairman of the Board

Dated: April 14, 2020

/s/ Jeff E. Margolis

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

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.