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

FORM 8-K

Current Report

Pursuant to Section 13 or 15(d) of
the Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): September 8, 2016

RESPIRERX PHARMACEUTICALS INC.
(Exact name of registrant as specified in its charter)

Delaware	**1-16467**	**33-0303583**
(State or other jurisdiction of incorporation)	**(Commission File Number)**	**(I.R.S Employer Identification No.)**

126 Valley Road, Suite C **Glen Rock, New Jersey** **(Address of principal executive offices)**	**07452** **(Zip Code)**

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

(Former name or former address, if changed since last report.)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

[ ] Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

[ ] Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

[ ] Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

[ ] Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Item 7.01 Regulation FD Disclosure

On September 8, 2016, RespireRx Pharmaceuticals Inc. (the "Company") announced that the Company's President and Chief Executive Officer, James S. Manuso, Ph.D., will be presenting at the Rodman & Renshaw 18th Annual Global Investment Conference at the Lotte New York Palace Hotel in New York, New York. Dr. Manuso is currently scheduled to present at 4:15 p.m. Eastern Time on Monday, September 12, 2016.

Dr. Manuso will present the Company's top-line data from its Phase 2A clinical trial of its proprietary orally administered ampakine, CX1739, conducted at the Duke University School of Medicine, which was determined to be safe and well tolerated and antagonized the respiratory depressive effects of remifentanil, a potent opioid. Dr. Manuso will also present the Company's upcoming clinical initiatives with ampakines for central sleep apnea (Phase 2B) and spinal cord injury. Dr. Manuso will provide an update on dronabinol for obstructive sleep apnea (Phase 2B).

The slide presentation that the Company will be using at the conference is attached as Exhibit 99.1 and is being furnished and not filed pursuant to Item 7.01 of Form 8-K. The presentation will be available by live webcast that can be accessed http://wsw.com/webcast/rrshq26/rspi. The presentation and slides will be accessible after the presentation by clicking on the investors tab on the RespireRx web-site at www.respirerx.com and following the links and instructions.

The press release announcing the Company's participation in the conference is attached as Exhibit 99.2. A subsequent press release, dated September 12, 2016, announcing preliminary, top-line results of the Company's recently concluded Phase 2A clinical trial testing the impact of CX1739 on opioid-induced respiratory depression, is also attached as Exhibit 99.3.

Item 9.01 Financial Statements and Exhibits

(d) Exhibits.

A list of exhibits that are furnished and filed as part of this report is set forth in the Exhibit Index, which is presented elsewhere in this document, and is incorporated herein by reference.

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

RESPIRERX PHARMACEUTICALS INC.

Date: September 12, 2016

By: */s/ James S. Manuso*
James S. Manuso
President and Chief Executive Officer

EXHIBIT INDEX

Exhibit Number	Exhibit Description
99.1	Slide Presentation*
99.2	Press Release dated September 8, 2016*
99.3	Press Release dated September 12, 2016*

* Furnished herewith.

Exhibit 99.1

RespireRx Pharmaceuticals Inc

OTC QB: RSPId

James S. Manuso, Ph.D., President & CEO

Rodman & Renshaw: September 12 – 13, 2016
18th Annual Global Investment Conference

Medicines for Respiratory Diseases

Forward Looking Statements

RespireRx Pharmaceuticals Inc

The matters discussed in this presentation that are not historical facts are "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 and we intend that such forward-looking statements be subject to the safe harbor created thereby. Forward-looking statements include, but are not limited to, statements containing the words "believes," "anticipates," "intends," "estimates," "plans," "expects," "projects" and words of similar import. Readers are cautioned not to place undue reliance on these forward-looking statements, which are based on the information available to management at this time and which speak only as of the date of this presentation. The Company undertakes no obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise. These forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause actual results, performance or achievements of the Company or its industry to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. All forward-looking statements should be evaluated with the understanding of their inherent uncertainty and in the context of the Company's filings with the Securities and Exchange Commission, including the risk factors contained therein. While the Company believes the information contained herein is reliable, the Company makes no representations or warranties regarding the accuracy or completeness of this information.

Breaking News

RespireRx Pharmaceuticals Inc

- September 12, 2016 Press Release
  - Positive top-line results from CX1739 Duke clinical trial in Opioid-induced Respiratory Depression
- September 1, 2016 Press Release
  - Implementation of 325 to 1 reverse split of common stock
- Sets the stage for potential financing and Up-Listing

Breath

RespireRx Pharmaceuticals Inc

"Breath is the universal factor of life. We are born the first time we inspire, and we die the last time we expire. Breath is life itself. In Sanskrit the same word means both breath and life."

.....Abbot George Burke

Company Focus

RespireRx Pharmaceuticals Inc

- **Sleep Apneas**
  - Dronabinol for Obstructive Sleep Apnea (**OSA**)
  - Ampakines for Central Sleep Apnea (**CSA**)
- **Drug-induced Respiratory Depression (RD) - Ampakines**
  - Acute use – surgical anesthesia/sedation
  - Semi-acute use – post-surgical pain management with opioids
  - Chronic use – outpatient pain management with opioids
- **Spinal Cord Injury – Ampakines**

Innovative Medicines for Respiratory Diseases

RespireRx Pharmaceuticals Inc

- Two proprietary, small molecule platforms
- Three Phase 2 development programs
- Additional pre-clinical programs
- Focus on blockbuster markets with unmet clinical needs
- More than 120 + patents and patent applications
- Multiple opportunities for strategic collaborations
- Non-dilutive financing from NHLBI and NIDA
- Experienced and accomplished management team

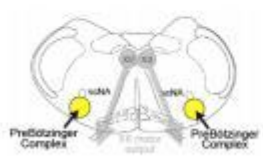
Respiratory Diseases Product Pipeline

RespireRx Pharmaceuticals Inc

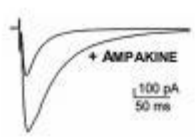
Compound	Indication	Preclinical	Phase 1	Phase 2
Dronabinol	Obstructive Sleep Apnea	→	→	→
CX1739	Central Sleep Apnea Opioid-induced RD	→ →	→ →	→ →
CX717	Spinal Cord Injury Opioid-induced RD	→ →	→ →	 →
CX1942	Drug-induced RD (injectable)	→		

Translational Approaches to Respiratory Disorders – A Short Course

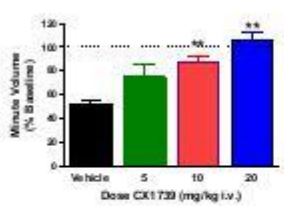
RespireRx Pharmaceuticals Inc



- Brain stem nuclei that regulate breathing contain opiate and AMPA glutamate receptors that inhibit and excite, respectively



- Ampakines act as positive, allosteric modulators of the AMPA-type glutamate receptor to enhance excitation and prolong and strengthen synaptic transmission



- In animal models, ampakines antagonize opioid-induced respiratory depression

CX1739: A Third Generation, Oral Ampakine in Phase 2

RespireRx Pharmaceuticals Inc

- **Targeted Indications**
  - Central Sleep Apnea (CSA)
  - Reversal and prevention of opioid-induced Respiratory Depression
  - Combination formulation with an opioid for treatment of chronic pain

- **Stage of Development**
  - Successfully completed four Phase 1 and 2 Phase 2A studies
  - Phase 2A trial in opioid-induced RD completed at Duke University
  - Efficacy signals observed in CSA in Phase 2A Sleep Apnea study

- **Intellectual Property Protection (owned and licensed)**
  - Issued Composition-of-Matter Patent (expires 2028), filed worldwide
  - Method-of-use patent (expires 2030)

CX1739: Phase 2A in Opioid-Induced Respiratory Depression

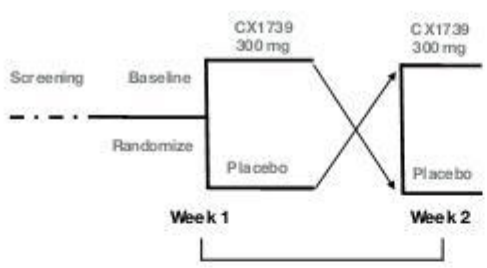
RespireRx Pharmaceuticals Inc

Protocol	Antagonism of Remifentanil-Induced Respiratory Depression by CX1739 in Two Clinical Models of Respiratory Depression
Design	Randomized, Blinded, Placebo-controlled, Cross-Over with Dose Escalation
Dosing	17 subject received and completed acute doses of placebo, 300 mg, 600 mg, and 900mg CX1739 (during separate weekly visits) followed by two protocols for remifentanil administration (REMI 1 and REMI 2)
Study Objectives	<u>Primary:</u> Time to respiratory recovery following remifentanil-induced RD during REMI 1 protocol Reduction in respiratory depression during REMI 2 protocol Safety when used in conjunction with remifentanil <u>Secondary:</u> Impact on analgesic effects of remifentanil Impact on volunteer bispectral index (BIS) measure of sedation

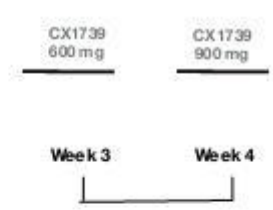
CX1739: Phase 2A – Overall Study Design

RespireRx Pharmaceuticals Inc

STAGE 1
Double-blind, Placebo-Controlled Crossover

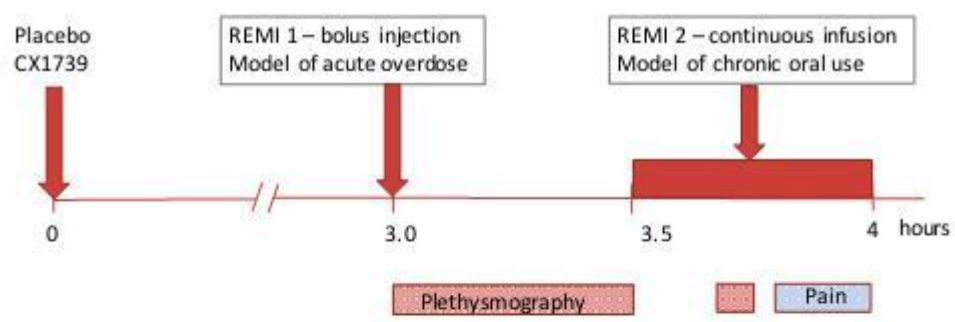


STAGE 2
Open-label, Dose Ascending



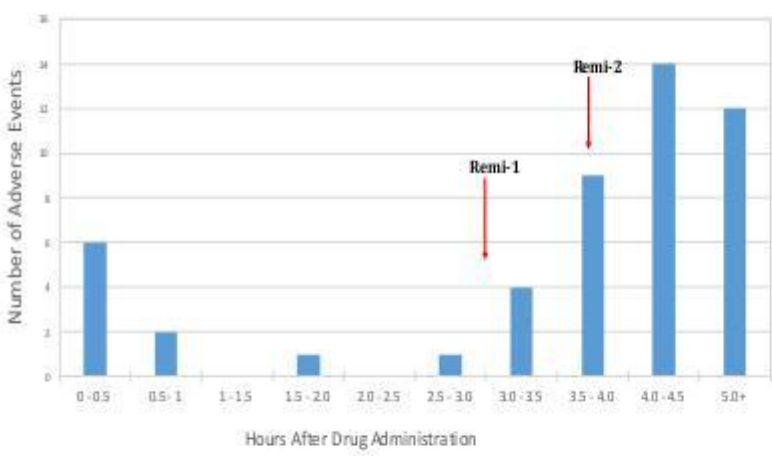
CX1739: Phase 2A – Daily Protocol

RespireRx Pharmaceuticals Inc



CX1739: Phase 2A – Safety

RespireRx Pharmaceuticals Inc

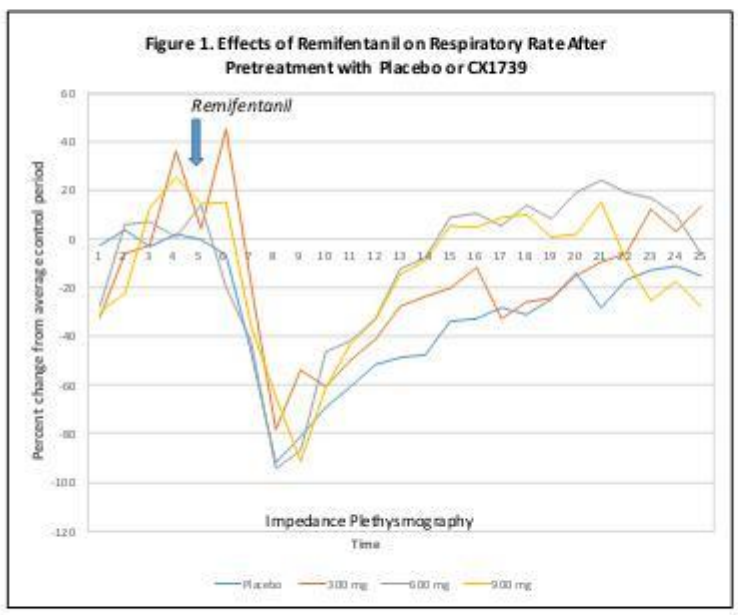


SAFETY DATA

- CX1739 was safe and well tolerated with no SAEs
- Most frequent AEs were nausea, vomiting, headache and dizziness, all of which are common side effects of opioids
- 39 of 49 AEs occurred after remifentanil
- 8 AEs occurred less than one hour after ampakine or placebo

CX1739: Phase 2A REMI 1 Single Subject Model of Acute Opiate Overdose

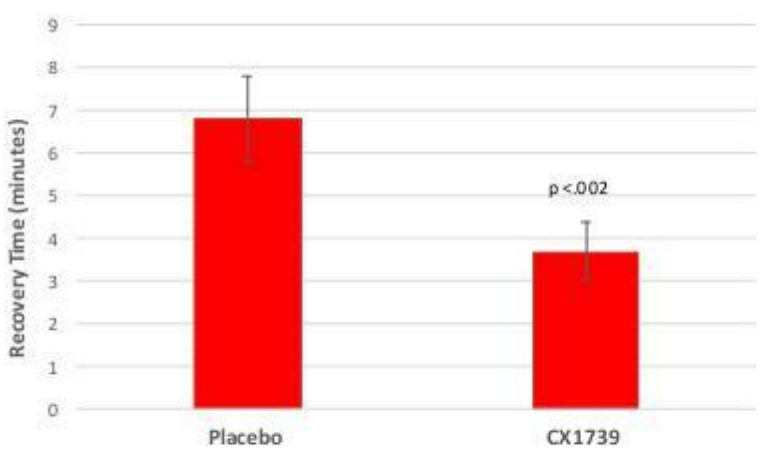
RespireRx Pharmaceuticals Inc



- After acute, bolus injection, remifentanil produced a rapid and dramatic decline in breathing
- Considerable variability both within and across subjects was observed

CX1739: Phase 2A REMI 1 – Model of Acute Opioid Overdose

RespireRx Pharmaceuticals Inc

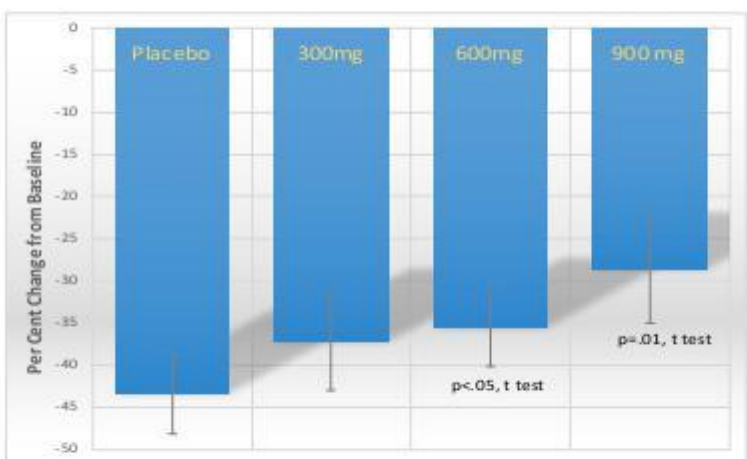


Primary Endpoint Met

- Significant decline in time to respiratory recovery for 300mg vs placebo
- Significant proportion of responders at one or more doses of CX1739 (13 out of 15, p<.005, z test)
- 600mg & 900mg vs placebo and 600mg & 900mg vs 300 mg were not statistically significant

CX1739: Phase 2A REMI 2 – Model of Chronic Opiate Use

RespireRx Pharmaceuticals Inc



Primary Endpoint Met

- CX1739 produced a statistically significant dose-related diminution in the respiratory depression produced by remifentanil

Central Sleep Apnea (CSA)

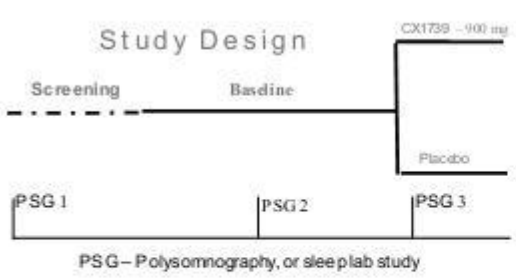
RespireRx Pharmaceuticals Inc

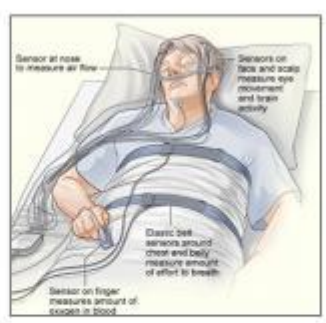
- **Lack of drive from the brain to breathe during sleep**
- **CSA Patients**
  - 70% of chronic narcotic users
  - Up to 40% of heart failure patients
  - 5% of sleep apnea patients are idiopathic
- **No medicine or device is approved for CSA**

CX1739: Completed Phase 2A in Sleep Apnea – Single Dose

RespireRx Pharmaceuticals Inc

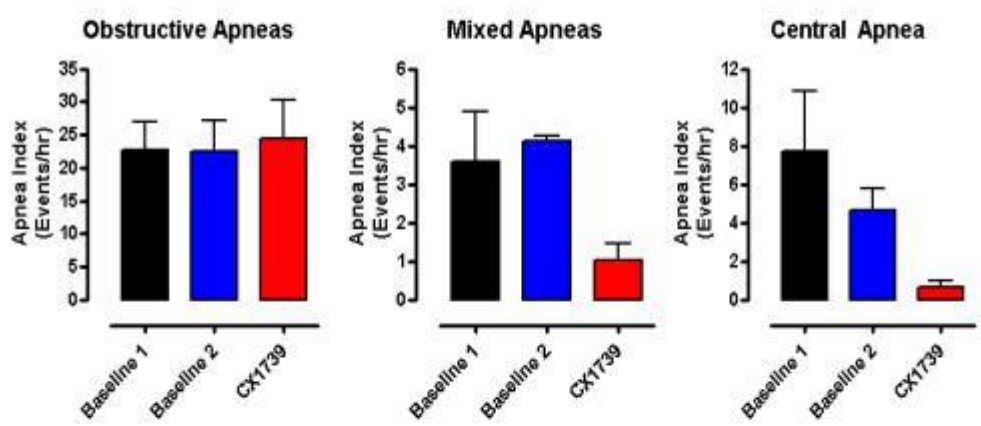
Design	Randomized, double-blind, placebo-controlled study
Population	20 adults with all types of moderate to severe sleep apnea (16 given CX1739; 4 given Placebo)
Dosing	Each subject received either placebo or a single dose of 900mg CX1739 one hour before lights out
Primary Measures	Apnea-Hypopnea measures; Oxygen saturation; Sleep quality, measured by PSG (Apnea: no airflow for >10s; Hypopnea: reduced airflow for >10s)





Patient Selection: CX1739 Was More Effective in Treating Mixed and Central Sleep Apneas

RespireRx Pharmaceuticals Inc



Oertel et al., (2010) Clin Pharmacol Ther 87(2):204-11

CX1739: Proposed Phase 2 in Sleep Apnea – Multiple Dose

RespireRx Pharmaceuticals Inc

Protocol	Evaluation of CX1739 for the Treatment of Central Sleep Apnea in Patients on Chronic Opioid Therapy
Design	• Randomized, Blinded, Placebo-controlled, Multiple Dose Study at Multiple Sites • Subjects with a documented history of chronic opioid use for pain management and a diagnosis of Central Sleep Apnea (CSA) as confirmed by plethysmography and EEG
Dosing	BID doses of placebo, 100 mg, 250 mg, and 500mg CX1739 daily for 28 days
Study Objectives	Primary: To evaluate the ability of daily, BID doses of CX1739 to reduceAHI, AHT and daytime sleepiness Secondary: To evaluate whether CX1739 reduces the analgesic effects of opioids for pain management To evaluate whether CX1739 improves Sleep Architecture To evaluate the safety of CX1739 when used in conjunction with oral opioids

CX717: Second Generation Oral Ampakine in Phase 2

RespireRx Pharmaceuticals Inc

- **Targeted Indications**
  - Spinal Cord Injury
  - Combination formulation with an opioid for treatment of chronic pain
- **Stage of Development**
  - Completed 6 Phase 1 and 4 Phase 2 studies
  - Two positive Phase 2A trials in opioid-induced RD
- **Intellectual Property Protection**
  - Method-of-use patent (expires 2030)
  - Waxman-Hatch
  - Potential breakthrough status for SCI

CX717: Spinal Cord Injury

RespireRx Pharmaceuticals Inc

Incidence

- Estimated 276,000 people with SCI in the US, with 12,000 new cases per year
- Eligible for Orphan Status

Breathing problems are substantial after SCI

- Approximately half of all SCIs occur in the cervical region, leading to increased morbidity and mortality
- More than two-thirds of acute cervical SCI patients require respiratory support (usually mechanical ventilation) and 40% require continued ventilatory support after acute care discharge

Current Treatments

- Mechanical ventilation
- Resistive breathing exercises
- Diaphragm pacing using electrical nerve stimulation

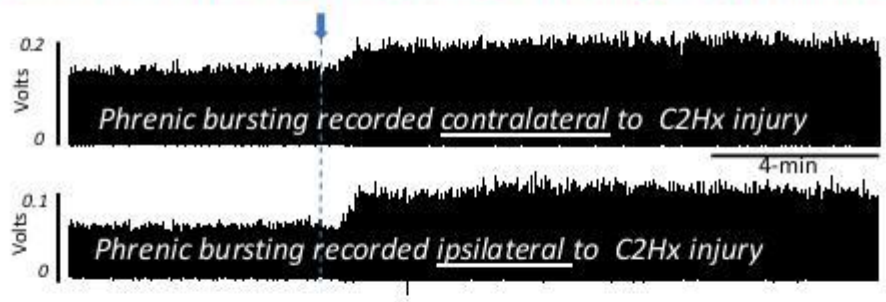
Clear Market Need

- Respiratory disorders are the leading cause of death for SCI patients
- There exists a significant and unmet need for translatable strategies to improve respiratory motor function after incomplete cervical SCI

CX717 – Animal Models of Spinal Cord Injury

RespireRx Pharmaceuticals Inc

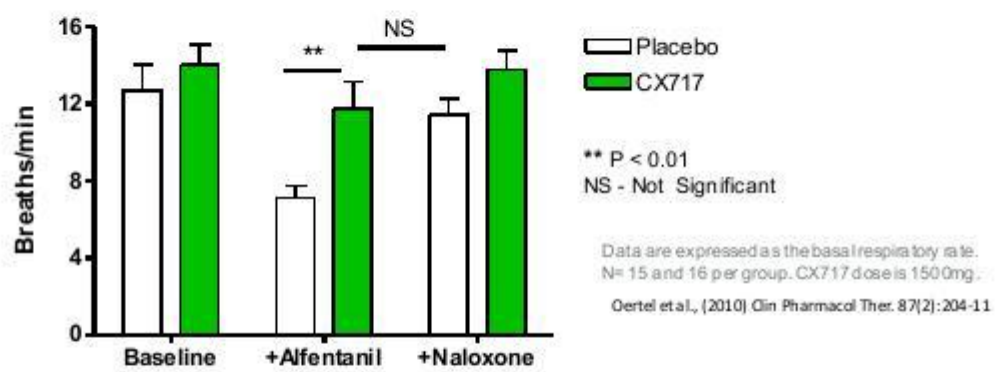
Unilateral hemi-transections at the level of the 2nd cervical vertebra are performed on rats and electrical activity is recorded from phrenic nerves, which innervate the diaphragm and contribute to the regulation of breathing.



8 weeks following surgery, CX717 (15 mg/kg) increases amplitude in electrical recordings taken from rat phrenic nerves

CX717 Prevents Opioid-induced Respiratory Depression in Humans – Target Engagement

RespireRx Pharmaceuticals Inc



Data are expressed as the basal respiratory rate.
N= 15 and 16 per group. CX717 dose is 1500mg.

Oertel et al., (2010) Clin Pharmacol Ther. 87(2):204-11

Alfentanil reduced breathing rate & produced Respiratory Depression

CX717 maintains respiratory rate in the presence of Alfentanil

CX717: Proposed Phase 2 in Spinal Cord Injury – Multiple Dose

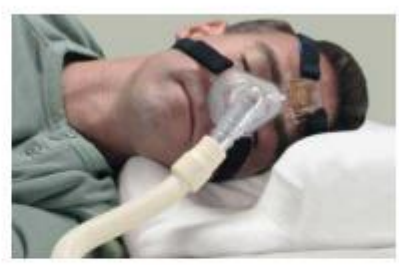
RespireRx Pharmaceuticals Inc

Protocol	Evaluation of CX717 for the Treatment of Breathing Disorder in Patients with SCI
Design	Randomized, Blinded, Placebo-controlled, Ascending Dose Study
Dosing	BID doses of placebo, 250 mg, 500 mg and 750 mg of CX717 daily for 28 days
Study Objectives	Primary: To evaluate the ability of daily, BID doses of CX717 to improve breathing Secondary: To evaluate whether CX717 improves Sleep Architecture

Obstructive Sleep Apnea

RespireRx Pharmaceuticals Inc

- **Sleep Apnea**
  - Repetitive episodes of airflow cessation (apnea) or reduction (hypopnea) for more than 10 seconds during sleep
  - Three types: Obstructive, Central & Mixed
- **The Sleep Apnea Market is Large**
  - 18 million U.S. adults suffer from moderate or severe sleep apneas
  - Market potential for sleep apneas is $3 - 9 Billion/Year
- **Current Treatments**
  - CPAP device
  - Surgery
  - Dental devices
- **Clear Market Need**
  - Poor compliance with CPAP
  - No drug treatment available



Dronabinol: Breakthrough Treatment for OSA

RespireRx Pharmaceuticals Inc

- **Mechanism of Action**
  - Dronabinol is (delta 9) THC, a cannabinoid agonist
- **Background**
  - Schedule III drug available by prescription, with a low risk of addiction
  - Approved for the treatment of anorexia in AIDS patients and nausea and vomiting in cancer patients undergoing chemotherapy
  - Phase 2A data demonstrated clear signal of activity in OSA
  - Phase 2B study completed and awaiting data
- **Intellectual Property**
  - License to issued method-of-use patent in the US for the use of dronabinol for treating OSA (expires 2025)
  - Pending patents on modified release formulations
- **Funding**
  - $5MM NIH-funded grant for Phase 2B study in OSA

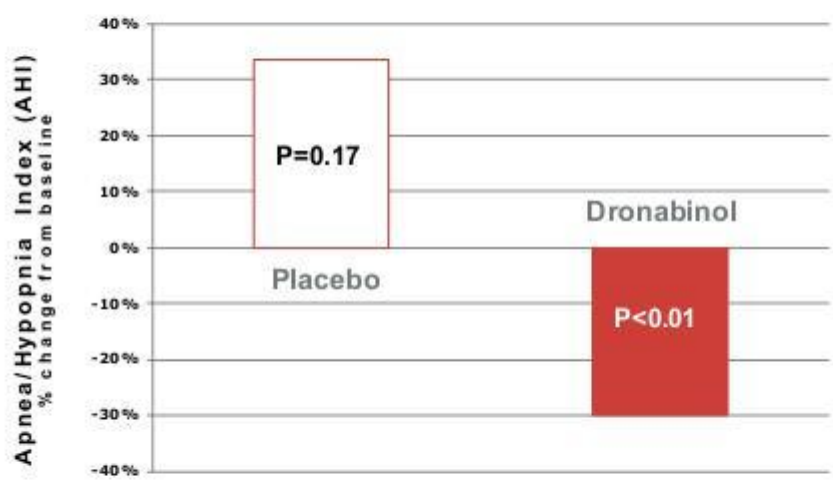
Completed Phase 2A Trial of Dronabinol in OSA

RespireRx Pharmaceuticals Inc

- **Randomized, double-blind, placebo-controlled dose escalation study in 22 patients with OSA**
- **Placebo (N=5) or dronabinol (N=17) for 21 days**
  - 2.5, 5 and 10 mg/night studied with weekly dose escalation
- **Overnight polysomnogram (PSG) at baseline, and after 7, 14 and 21 days of treatment**
- **FDA-accepted efficacy tests:**
  - Apnea-Hypopnea Time (AHT)
  - Apnea-Hypopnea Index (AHI)
  - Stanford Sleepiness Scale (SSS)

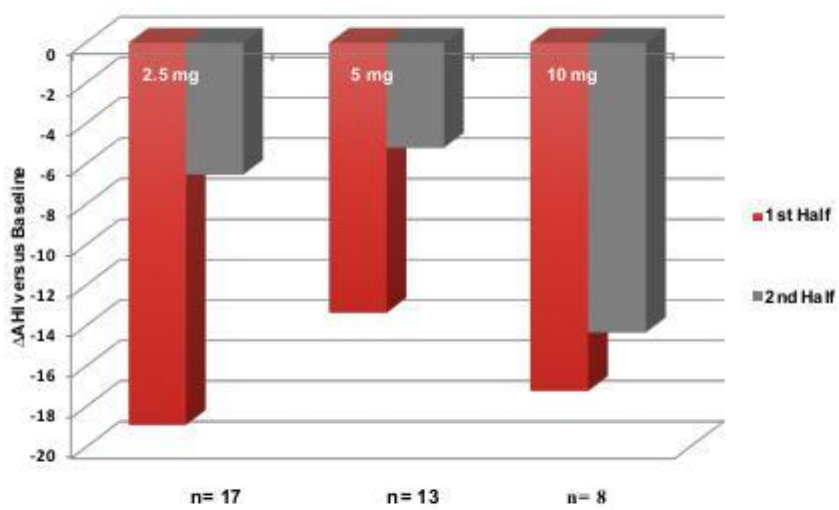
Dronabinol Proven to Reduce Apnea in OSA Subjects

RespireRx Pharmaceuticals Inc



Apnea Suppression as a Function of Dose and Time

RespireRx Pharmaceuticals Inc



The plasma half-life of dronabinol is 2 – 4 hours.

Completed Dronabinol Phase 2B Clinical Trial in OSA

RespireRx Pharmaceuticals Inc

- Sponsored and led by U of Illinois
- 4 major centers, fully funded by NIH
- Doses: Placebo, 2.5 mg, 10 mg qd
- 6 weeks dosing
- Trial completed
- Data expected Q4/2016
- Meet with FDA after trial completion to determine registration path forward

The Dronabinol Opportunity

RespireRx Pharmaceuticals Inc

Impact on Patient	Commercial Opportunity
First medicine available for OSA	Changes the nature of OSA treatment
Ease of Use/Better Patient Compliance	Broadly expands prescriber base from sleep specialists to include primary care physicians and cardiologists
Low cost	Recurring lifetime sales versus one time sale or ongoing rental of a device
Safe and effective	Market will expand into the currently undiagnosed/untreated population
Potential for better cardiovascular outcomes	Potential for reducing systemic healthcare costs by reduced cardiac re-hospitalizations

Protecting Dronabinol in the Market

RespireRx Pharmaceuticals Inc

- Issued Method-of-Use patent for dronabinol in OSA
  - Expires in 2025
- Schedule III drug: off-label use monitored by US government, discouraging generic manufacturers from selling off-label
- Off-label use of generics and medical marijuana are not covered by insurers
- Market pricing and manufacturing protection

Respiratory Diseases Product Pipeline

RespireRx Pharmaceuticals Inc

Compound	Indication	Preclinical	Phase 1	Phase 2
Dronabinol	Obstructive Sleep Apnea	→	→	→
CX1739	Central Sleep Apnea Opioid-induced RD	→ →	→ →	→ →
CX717	Spinal Cord Injury Opioid-induced RD	→ →	→ →	 →
CX1942	Drug-induced RD (injectable)	→		

Development Milestones

RespireRx Pharmaceuticals Inc

	4Q2016	1Q2017	2Q2017	3Q2017	4Q2017	1Q2018
CX1739						
RD Clinical Trial at Duke						
Central Sleep Apnea Clinical Trial						
Formulation, PK and ADME						
CX717						
FDA Regulatory						
Spinal Cord Injury Clinical Trial						
Ampakine/Opioid Combination Formulation						
Formulation Design						
Phase I Clinical Trials for Efficacy & PK						
Dronabinol						
FDA Regulatory						
Formulation						

Capital Structure (rounded) & Market Metrics

RespireRx Pharmaceuticals Inc

	Total as of September 6, 2016 (unless otherwise noted) Post Reverse Split
Common Stock	2,019,000
Common Stock Equivalents of Convertible Notes-pro forma to September 15, 2016	29,000
Common Stock Equivalents of all Options and Warrants Granted (excludes 381,000 reserved for equity plans)	1,735,000
Total	3,783,000
Simple Avg of Four Weekly VWAP's to September 2, 2016	$7.01756
Fully diluted market capitalization (rounded)	$26,547,000

Management and Directors

RespireRx Pharmaceuticals Inc

James Manuso	President, CEO & Vice Chairman
Arnold Lippa	CSO & Chairman
Jeff Margolis	VP, Secretary/Treasurer, Director
Robert Weingarten	CFO, Director
Richard Purcell	Senior VP, R& D
Katie MacFarlane	Director Senior VP, Napo Pharmaceuticals
James Sapirstein	Director CEO, ContraVir Pharmaceuticals
John Greer	Chairman, Scientific Advisory Board Prof & Dir. Neuroscience Ctr., U. Alberta

Innovative Medicines for Respiratory Diseases

RespireRx Pharmaceuticals Inc

- Two proprietary, small molecule platforms
- Three Phase 2 development programs
- Additional pre-clinical programs
- Focus on blockbuster markets with unmet clinical needs
- More than 120 + patents and patent applications
- Multiple opportunities for strategic collaborations
- Non-dilutive financing from NHLBI and NIDA
- Experienced and accomplished management team

RespireRx Pharmaceuticals Inc

OTC QB: RSPId

James S. Manuso, Ph.D., President & CEO

Rodman & Renshaw: September 12 – 13, 2016
18th Annual Global Investment Conference

Medicines for Respiratory Diseases

Exhibit 99.2

RespireRx Pharmaceuticals Inc. to Present at the Rodman & Renshaw 18th Annual Global Investment Conference on September 12, 2016

Glen Rock, N.J., September 8, 2016/Globe Newswire – RespireRx Pharmaceuticals Inc. (OTC QB: RSPI) ("RespireRx" or the "Company"), a leader in the development of medicines for respiratory disorders, including drug-induced respiratory depression and sleep apneas, announced that the Company's President, CEO and Vice Chairman of the Board of Directors, James S. Manuso, Ph.D., will present at the Rodman & Renshaw 18th Annual Global Investment Conference (www.rodmanandrenshaw.com) at the Lotte New York Palace Hotel in New York, New York on Monday, September 12, 2016 at 4:15 PM ET. The Conference is sponsored by H.C. Wainwright & Co., LLC and is being held on September 12 and 13, 2016. Dr. Manuso will be available for one-on-one meetings with Conference attendees on both days.

Commented Dr. Manuso, "The presentation at the Rodman & Renshaw Conference will allow us to provide investors with an update on RespireRx's recent reverse stock split, strategic initiatives and progress on research and development programs. In particular, I look forward to discussing preliminary, top-line results of the Company's recently concluded Phase 2A clinical trial testing the impact of the Company's proprietary oral ampakine, CX-1739, on opioid-induced respiratory depression." Dr. Manuso also will discuss the Company's other product pipeline candidates, including dronabinol, and the Company's development timelines. Dr. Manuso concluded, "We are pleased to keep our shareholders and other stakeholders informed as to the continuing progress of RespireRx's scientific, clinical and regulatory development initiatives."

Dr. Manuso's live presentation and accompanying slides will be accessible on Monday, September 12, 2016 at 4:15 PM ET using the following link: http://wsw.com/webcast/rrshq26/rspi. The presentation and slides will be accessible after the presentation by clicking on the investors tab on the RespireRx web-site at www.respirerx.com and following the links and instructions. A copy of the slide presentation being presented at the Conference will be submitted in a Form 8-K filing with the U.S. Securities and Exchange Commission prior to the presentation.

About RespireRx Pharmaceuticals Inc.

RespireRx Pharmaceuticals Inc. is a leader in the development of medicines for respiratory disorders, with a focus on drug-induced respiratory depression and sleep apneas. The Company holds exclusive licenses and owns patents and patent applications for certain families of chemical compounds that claim the chemical structures and their uses in the treatment of a variety of disorders, as well as claims for novel uses of known drugs.

RespireRx has a pipeline of medicines in Phase 2 clinical development focused on pharmaceutical treatments for a variety of different breathing disorders. Clinical development in the area of respiratory disorders, particularly drug-induced respiratory depression and sleep apnea, has created opportunities for the development and commercialization of the Company's compounds.

Ampakines. One platform of proprietary medicines being developed by RespireRx is a class of ampakines, which act to enhance the actions of the excitatory neurotransmitter glutamate at AMPA glutamate receptors. Several ampakines, in both oral and injectable forms, are being developed by the Company for the treatment of a variety of breathing disorders. In clinical studies, select ampakines have shown preliminary efficacy in central sleep apnea and in the control of respiratory depression produced by opioids, without altering the opioid analgesic effects. In animal models of orphan disorders, such as Pompe Disease, spinal cord injury and perinatal respiratory distress, it has been demonstrated that certain ampakines improve breathing function. The Company's compounds belong to a new class that does not display the undesirable side effects previously reported for other ampakines.

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During March 2016, a Phase 2A clinical trial at Duke University School of Medicine was initiated with the Company's proprietary ampakine, CX1739, to determine the ability of its orally administered form to prevent the respiratory depression produced by remifentanil, a potent opioid, without altering remifentanil's analgesic properties. The dosing portion of the clinical trial was completed in June 2016 and the clinical trial was formally completed on July 11, 2016. The Company is working with the Duke University clinical research team to finalize data analysis and issue a final report on the results of the clinical trial by the end of December 2016.

Cannabinoids. The other platform being developed by RespireRx is the class of compounds known as cannabinoids, including dronabinol. Under a license agreement with the University of Illinois, the Company has rights to patents claiming the use of cannabinoids for the treatment of sleep-related breathing disorders. In a double-blind, placebo-controlled, dose-ascending Phase 2A clinical study conducted by the Company, dronabinol produced a statistically significant reduction in the Apnea-Hypopnea Index, the primary therapeutic end-point, and was observed to be safe and well-tolerated in a group of patients with Obstructive Sleep Apnea ("OSA"). The University of Illinois and three other centers conducted a six week, double-blind, placebo-controlled Phase 2B clinical trial investigating the effects of dronabinol in patients with OSA. The University of Illinois has indicated that recruitment for this clinical trial was completed during the second quarter of 2016. Final research results are expected to be published in the fourth quarter of 2016. This clinical trial is fully funded by the National Heart, Lung and Blood Institute of the National Institutes of Health and is managed by University of Illinios researchers.

Additional information about the Company and the matters discussed herein can be obtained on the Company's web-site at www.RespireRx.com or in the Company's filings with the U.S. Securities and Exchange Commission at www.sec.gov.

Cautionary Note Regarding Forward-Looking Statements

This press release 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 and we intend that such forward-looking statements be subject to the safe harbor created thereby. These might include statements regarding the Company's 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, deisgn, execution, timing, costs and results, future product demand, supply, manufacturing, costs, marketing and pricing factors are all forward-looking statements.

In some cases, forward-looking statements may be identified by words including "anticipates," "believes," "intends," "estimates," "expects," "plans," and similar expressions include, but are not limited to, statements regarding (i) future research plans, expenditures and results, (ii) potential collaborative arrangements, (iii) the potential utility of our proposed products, and (iv) 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 and competitive conditions, 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, and market and general economic factors. This press release should be read in conjunction with the condensed consolidated financial statements (unaudited) and notes thereto included in Item 1 of the Company's most recently filed Quarterly Report on Form 10-Q and the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2015, including the section entitled "Item 1A. Risk Factors." The Company does not intend to update or revise any forward-looking statements to reflect new information, future events or otherwise.

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RespireRx Pharmaceuticals Inc.
Announces Preliminary Top-Line Analysis of Data from
Duke University Phase 2A Clinical Trial of CX1739

RespireRx Reports Safety and Efficacy Data

Glen Rock, N.J., September 12, 2016/Globe Newswire – RespireRx Pharmaceuticals Inc. (OTCQB: RSPI) ("RespireRx" or the "Company") is a leader in the development of medicines for respiratory disorders, including drug-induced respiratory depression (RD) and sleep apneas.

RespireRx is today reporting preliminary top-line data from its Phase 2A clinical trial of CX1739, the Company's proprietary, orally administered ampakine. CX1739 was determined to be safe and well tolerated, and antagonized the respiratory depressive effects of remifentanil (REMI), a potent opioid, in clinical models of acute opioid overdose and chronic opioid use. These results demonstrate target engagement of AMPA glutamate receptors and confirm the Company's translational approach to developing medicines for respiratory disorders.

The Duke University School of Medicine initiated this Company-funded Phase 2A clinical trial in March 2016. The dosing and data accumulation phase of the clinical trial was completed in June 2016 and the clinical trial was formally completed on July 11, 2016. Database unblinding occurred on September 7, 2016.

Study Design

The clinical trial, conducted in two separate stages over a four week period, was designed to assess the safety of CX1739, as well as its ability to antagonize the respiratory depressive effect of REMI without altering its analgesic properties.

Stage 1, a randomized, double-blind, crossover study comparing 300 mg of CX1739 to placebo, was considered a primary outcome study. After an overnight stay at the clinical facility, subjects were administered either placebo or CX1739. For the first visit, subjects were randomly administered either placebo or 300 mg CX1739. On the second visit, subjects were crossed over and administered the other compound.

Three hours after receiving placebo or CX1739, subjects underwent a REMI 1 period in which respiration was measured by impedance plethysmography for 5 minutes, in order to establish a baseline. Subjects then received an intravenous bolus injection of REMI (1 ∝g/kg) and respiration was measured for an additional 20 minutes after the bolus injections). During REMI 1, the primary measure used to determine antagonism of respiratory depression was the calculated time to recover (recovery time – RT) from the maximal respiratory depressant effects (Emax) of REMI.

Thirty minutes after the bolus injection of REMI, subjects underwent a REMI 2 period in which a continuous infusion protocol for REMI was begun (0.25 ∝g/kg bolus followed immediately by a constant infusion calculated to achieve blood levels of 2 ng/ml). After allowing 10 minutes for equilibration, respiratory rate, pain and pupilometry measurements were taken.

REMI 1 was designed as a model of acute opioid overdose, while REMI 2 was designed as a model of chronic, opioid consumption in which opioid blood levels remain relatively constant.

The clinical trial also evaluated the safety of CX1739 when taken alone and in conjunction with REMI and investigated the effect of CX1739 on the analgesic and sedative effects of REMI. These latter data have not yet been analyzed and will be reported at a future date.

Stage 2 took place during the second two week period and was designed as an open-label, ascending dose study to assess the ability of 600 and 900 mg of CX1739 to antagonize the respiratory depressive effects of REMI. Otherwise, Stage 2 was conducted in the same manner as Stage 1.

Safety and Study Conduct

Twenty-one subjects initially were enrolled in the study and all were included in the safety analysis. Four subjects terminated early, two because of scheduling problems and two because of adverse events (AEs). Of the 17 subjects who completed the study, two did not display maximal depression of respiration rate (Emax) >25% and were not included in the respiratory data analyses.

In general, CX1739 was safe and well tolerated, and no serious adverse events (SAEs) occurred. By far, the most frequent AEs were nausea, vomiting, headache and dizziness, all of which are common side effects of opioids. Forty-nine AEs were reported by 15 of the 21 subjects. Thirty-nine AEs occurred after the administration of REMI and 8 AEs occurred less than one hour after ampakine or placebo administration, a time period that is too early for significant blood levels of CX1739 to have occurred.

Efficacy Measures

REMI 1. Acute bolus injection of REMI caused a rapid and dramatic decline in respiration, with Emax ranging from 15% - 100% across subjects. When subjects in Stage 1 were pre-treated with 300 mg of CX1739, a statistically significant reduction of RT, the primary outcome measure, was observed. RT was reduced from a mean of 6.8± 0.98 after placebo pre-treatment to a mean of 4.4±0.77 after 300 mg of CX1739 pre-treatment ($p=.01$, paired t test). In Stage 2, RT was reduced for both doses, although no significant differences ($p>.05$) were observed when these doses were compared to either placebo or 300 mg. While this difference between 300 mg and the higher doses might reflect greater efficacy at the 300 mg dose, the Company believes that this lack of significance for the higher doses might also reflect inter-subject variability in what doses produced the optimum decline in RT. Supporting this idea, responder analysis revealed that decreases in RT were observed, in a statistically significant proportion of subjects (13 out of 15, $p<.005$, z test), after one or more doses of CX1739. Using these data from optimum doses, mean RT was significantly ($p<.002$, paired t test) reduced from 6.8 +0.98 minutes after placebo to 3.7 +0.70 minutes after CX1739.

REMI 2. The REMI 2 period began 30 minutes after the REMI 1 bolus injection of REMI and in this case was a continuous intravenous infusion. Baseline respiration was recorded during the first 2 minutes. Ten minutes after REMI 2 began, when respiratory rates and presumably blood levels of REMI had stabilized, respiration was monitored continuously for 5 minutes and the average percentage change from baseline for the 5 minute interval was determined. The data from 5 subjects was excluded from analysis because the REMI produced less than 25% depression of respiratory rate when these subjects were pretreated with placebo. CX1739 produced a dose-related diminution in the respiratory depression produced by REMI, with statistically significant differences from placebo observed at 600 mg ($p < 0.05$, t test) and 900 mg ($p = 0.01$, t test).

Data regarding CX1739's ability to alter the opioid's analgesic properties have not yet been analyzed. A full statistical analysis is expected to be completed during October 2016 and a clinical study report is expected to be completed by the end of December 2016.

Conclusions

Having demonstrated proof of principle and target engagement, the Company has concluded that further development of CX1739 to determine its potential efficacy in the appropriate clinical indications is warranted, and future studies are being designed and planned.

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Cannabinoids. A second platform being developed by RespireRx is the class of compounds known as cannabinoids, including, in particular, dronabinol, a synthetic version of Δ9-THC (Δ9-tetrahydrocannabinol). Under a license agreement with the University of Illinois, the Company has rights to patents claiming the use of cannabinoids for the treatment of sleep-related breathing disorders. In a double -blind, placebo-controlled, dose-ascending Phase 2A clinical study conducted by the Company, dronabinol produced a statistically significant reduction in the Apnea-Hypopnea Index, the primary therapeutic end- point, and was observed to be safe and well-tolerated in a group of patients with Obstructive Sleep Apnea ("OSA"). The University of Illinois and three other centers conducted a six week, double-blind, placebo- controlled Phase 2B clinical trial investigating the effects of dronabinol in patients with OSA. The University of Illinois has indicated that recruitment for this clinical trial was completed during the second quarter of 2016. Final research results are expected to be announced in the fourth quarter of 2016. This clinical trial was fully funded by the National Heart, Lung and Blood Institute of the National Institutes of Health and was managed by researchers at the University of Illinios.

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