RespireRx Pharmaceuticals Inc.
Publishes Compelling Scientific Evidence Demonstrating the Neurobiological Safety of Ampakine CX717 and Justifying Continued Clinical Development

Glen Rock, N.J., December 18 2017 /Globe Newswire – RespireRx Pharmaceuticals Inc. (OTCQB: RSPI) ("RespireRx" or the "Company"), is pleased to announce that a paper detailing the neurobiologic safety of the ampakine CX717 has been accepted for publication by Toxicological Sciences, the Journal of the American Society of Toxicology. The paper, co-authored by RespireRx scientists in conjunction with expert pathologists from around the country who contributed to an extensive neuropathology research program, presents clear scientific evidence that vacuoles that were discovered upon histological evaluation of brain tissue samples from animals treated with high doses of CX717, and which halted the company's promising CX717 clinical development effort, were actually an artifact of tissue processing rather than a toxic drug effect. Click here to read the abstract.

CX717, an ampakine that positively modulates the AMPA glutamate receptor, was in Phase II clinical trials to evaluate the drug's efficacy in several CNS disorders, including attention deficit hyperactivity disorder (ADHD), when the clinical development effort was halted by the FDA due to concerns of a potential neurotoxic effect. The decision was based on adverse pathology findings in non-clinical, long-term toxicity studies in several animal species. The neurotoxicity concerns arose due to a finding that histology samples preserved with fixative agents, taken from the brains of animals that were administered chronic, high doses of CX717 exhibited extensive vacuoles and tissue deterioration in the "white matter" of brain sections. The results were confusing because the animals showed no signs of neurologic dysfunction, and neurological deficits had never been observed in any pre-clinical nor clinical research studies. Despite the apparent *in vivo* safety of CX717, the FDA placed the compound on clinical in 2006 pending further research to characterize the features and a potential mechanism by which ampakines induce vacuoles in brain tissue. To address the problem, RespireRx undertook an extensive research effort and presented those data to FDA, resulting in a release from the original clinical hold. While no longer on clinical hold, the current paper provides an overview of the neuro-histopathology research program, which demonstrates that induction of brain vacuoles is a property unique to CX717 and not other ampakines, is caused by chemical reaction with the fixative agents formadehyde and methanol and, furthermore, that these vacuoles represent a *post mortem* artifact of tissue processing rather than direct CX717-induced neurotoxicity.

The manuscript concludes that "CX717-associated vacuoles do not represent a risk for human patients being treated with agents of this molecular class. Accordingly, the current data should clear the path for continuing clinical research on the use of this promising class of compounds to treat a broad range of currently underserved neurological diseases."

Richard Purcell, Senior Vice President of Research & Development at RespireRx, and the lead author on the paper stated, "Our robust data set - including neuropathology and neurophysiology assessment, biomarker evaluation, time-course photography, transmission electron microscopy, and chemistry experiments - establishes the safety of CX717, as well as our other lead ampakines and, in light of approved and pending use patents, justifies the Company's revival of the clinical development of CX717 for indications such as central sleep apnea, spinal cord injury and ADHD."

Gary Lynch, Ph.D., Professor at the Center for the Neurobiology of Learning and Memory at the University of California, Irvine, a co-author on the paper and an original inventor on the use of ampakines to enhance neuronal response, who remains a thought leader in the ampakine field, offered his view of the published research, "The compelling results reported in this paper are tremendously exciting because they resolve a nagging issue about an ampakine that had intriguing, positive effects in clinical trials. This

is a major step in the development of the entire family of compounds."

Added, Mr. Purcell, "With publication of these data, we look forward to meeting with FDA in the near future in order to open a new CX717 IND and advance the commercial development of the ampakines for the treatment of respiratory and CNS disorders."

About RespireRx Pharmaceuticals Inc.

RespireRx Pharmaceuticals Inc. is a leader in the development of medicines for respiratory disorders, with a focus on sleep apneas and drug-induced respiratory depression. The Company holds exclusive licenses and owns patents and patent applications or rights thereto 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 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 are 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 and CNS disorders. In clinical studies of respiratory function, 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. A Phase II clinical trial of the ampakine CX717 demonstrated preliminary efficacy in adult attention defecit hyperactivity disorder (ADHD). 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.

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.

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 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 the Company intends 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 design, 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 the Company's 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 discussion should be read in conjunction with the condensed consolidated financial statements (unaudited) and notes thereto included in Item 1 of the Company's current Quarterly Report on Form 10-Q as of and for the periods ending September 30, 2017 and the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2016, 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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