Letter to Stockholders and Other Stakeholders: A Brief Summary of Our Progress During Past Twelve Months and a Peek Looking Forward

Glen Rock, N.J., March 7, 2022 /Globe Newswire – RespireRx Pharmaceuticals Inc. (OTCQ:RSPI) ("RespireRx" or the "Company"), a leader in the discovery and development of innovative and revolutionary treatments to combat diseases caused by disruption of neuronal signaling, is pleased to provide a brief summary of our accomplishments during the prior twelve months as well as a peek looking forward. As we begin this new year, it is appropriate to briefly summarize our progress this past year and describe how we plan to move forward.

To our Stockholders and other Stakeholders:

Thank you for your continued support and shared confidence in the Company's efforts.

Possibly most visibly, the Company has implemented an internal restructuring plan with the hope of unlocking what we believe is unrealized value, based upon our two research platforms: pharmaceutical cannabinoids and neuromodulators.

ResolutionRx

Cannabinoids/Dronabinol

In ResolutionRx, our pharmaceutical cannabinoid platform, we are developing proprietary compounds based around dronabinol, an already FDA approved drug that targets the CB1 and CB2 receptors of the brain's endocannabinoid system. While we have successfully completed two clinical trials demonstrating the ability of dronabinol to improve obstructive sleep apnea (OSA), the commercially available form of dronabinol suffers from poor absorption, rapid and extensive liver metabolism and brief duration of action, requiring the use of high doses.

We have been developing novel, proprietary formulations for dronabinol that utilize lipid nanoparticle (LNP) technology and have identified several unique formulations with which we plan to conduct animal and human pharmacokinetic studies. We believe these new LNP formulations have the potential to overcome many of the shortcomings seen with the commercially available form of dronabinol. Overcoming these issues could greatly expand the use of dronabinol for the treatment of disorders that require longer durations of action and less variable blood levels, such as the treatment of obstructive sleep apnea and other conditions.

In support of this program, we have patents pending claiming blood levels, doses, duration of action and intend to submit additional patent applications claiming composition of matter, method of manufacture and method of treatment for dronabinol and other cannabinoids.

EndeavourRx

EndeavourRx, our neuromodulator platform, is made up of two programs: (a) our AMPAkines program, which is developing proprietary compounds that are positive allosteric modulators ("PAMs") of AMPA-type glutamate receptors and (b) our GABAkines program, which is developing proprietary compounds that are PAMs of $GABA_A$ receptors.

AMPAkines

In ongoing studies with Dr. David Fuller, our collaborator at the University of Florida, CX717 and CX1739, our lead clinical stage AMPAkines, continue to show enhancement of motor function in rodents after experiencing spinal injury. Dr. Fuller published the results of last year's work in two peer-reviewed journals. In particular, the latest paper, published in the *Journal of Neurotrauma* (http://doi.org/10.1089/neu.2021.0301) describes research conducted for the first time in awake freely moving rats as late as two weeks after having previously undergone unilateral spinal hemi-transection at the C2 spinal level. For the first time, low dose administration of either CX1739 or CX717 was shown to improve not only motor nerve and muscle activity recorded electrophysiologically from the lesioned side, but to significantly improve actual motor functioning and breathing, even under respiratory challenging conditions. The importance of these findings is described in the article by pointing out that the majority of the approximately 500,000 annual spinal cord injury ("SCI") cases reported globally involve injuries to the cervical spinal cord and, in severe cases, require the use of mechanical ventilation or direct diaphragm pacing to sustain ventilation.

These recent results have provided great impetus to conduct a Phase 2 clinical trial in patients recovering from spinal injury. Clinical sites have been identified and, pending financing, plans have been drafted to update the current CX1739 IND to incorporate a new clinical protocol and conduct the study.

With regard to intellectual property, new patent applications have been filed claiming the use of AMPAkines for the treatment of spinal cord injury and attention deficit hyperactivity disorder.

GABAkines

In our GABAkine program, KRM II-81, our lead GABAkine, is being developed as a potential breakthrough treatment for treatment resistant epilepsy and chronic pain. After our first full year of working with our new research scientists, Drs. Jeffrey Witkin and James Cook, Senior Research Fellows, and Dr. Rok Cerne, Senior Scientist, considerable headway has been made.

Drs. Witkin and Cerne have conducted pharmacology, metabolism, pharmacokinetic and safety studies to be included in future FDA filings. Several articles describing the results of these studies have been published in highly regarded peer reviewed journals, including two review articles and a book chapter detailing the anti-epileptic and analgesic properties of KRM II-81 and its importance in the overall field of GABAkines. Two additional manuscripts have been accepted for publication and an additional manuscript has been written.

Dr. Cook has begun scaling up chemical synthesis of KRM II-81 in order to provide sufficient active pharmaceutical ingredient (API) to begin IND enabling preclinical studies, which we plan

to conduct this year pending financing. In addition, substituted analogues of KRM II-81 have been made, particularly a soluble analogue that displays a similar pharmacological profile as KRM II-81.

Corporate Presentations

During 2021, our executives presented at multiple conferences, including BioTech Showcase, OTC Ventures Market Podcast, Life Sciences Investor Conference and the June 2021 Access China Biotech Virtual Investor Conference. Due to the COVID epidemic, these conferences were held virtually. In January 2022, Company executives presented at the 2022 Biotech Showcase and participated in multiple one-on-one meetings with prospective strategic partners, prospective investors and prospective relevant service providers. Company executives intend to participate in additional conferences, and to present in other forums.

Financing

Despite the successes of our research and development team, our major challenge has been to raise substantial equity or equity-linked financing to support our research and development plans, while minimizing the dilutive effect to pre-existing stockholders. At present, we believe that we are hindered primarily by our public corporate structure, our common stock not being listed on a national exchange, and low market capitalization as a result of our low stock price. Our shares are quoted on the OTCQB, the OTC Market's venture market with the ticker symbol RSPI.

For this reason, the Company has implemented an internal restructuring plan through which our two drug platforms have been reorganized into separate business units and may in the future be organized into private subsidiaries of RespireRx. We believe that by creating one or more subsidiaries to further the aims of ResolutionRx and EndeavourRx, it may be possible, through separate finance channels, to optimize their asset values and make them more attractive for capital raising as well as for strategic transactions.

The Company is also involved in business development efforts (licensing/sub-licensing, joint venture and other commercial structures) with a view to securing strategic partnerships that represent strategic and operational infrastructure additions, as well as cash and in-kind funding opportunities. These efforts have focused on, but have not been limited to, engaging with brand and generic pharmaceutical and biopharmaceutical companies as well as companies with potentially useful formulation or manufacturing capabilities, significant subject matter expertise and financial resources.

No assurance can be given that any financing or business development transaction will come to fruition or that if it does, that the terms will be favorable to the Company.

Regulation A Financing

The Company filed a Form 1-A which included an offering circular that was qualified by The Securities and Exchange Commission on December 13, 2021 and subsequently amended. The offering is of the Company's common stock and is up to $7.5 million at $0.02 per share and allows

for multiple closings until October 31, 2023 unless earlier terminated by the Company. With the current stock price below the offering price, to date, no closings have taken place.

Departure of Mr. Timothy Jones

Mr. Timothy Jones submitted a letter of resignation as the Company's President and Chief Executive Officer and as a member of the Company's Board of Directors effective January 31, 2022 subject to the execution of a termination and separation agreement with certain conditions precedent to its final effectiveness, which agreement was executed and all of which conditions have been met. Dr. Lippa has agreed to serve as the Company's Interim President and Interim Chief Executive Officer until a replacement President and CEO is hired, while retaining his titles as Chief Scientific Officer and Executive Chairman of the Board.

Summary

As you have now read, in the past twelve months, we experienced successes in the furtherance of our research and development despite our financing challenges. With the hoped for success of our ongoing financing efforts, we have plans in place for the following major projects in 2022, which we intend to implement if we achieve the hoped for success of our ongoing financing efforts:

1. conduct animal and human pharmacokinetic studies with three new proprietary dronabinol formulations in order to choose the best one for conducting a Phase 3 clinical efficacy study for OSA in 2023.

2. conduct a Phase 2 clinical trial investigating the effects of CX1739 in patients with SCI.

3. conduct sufficient preclinical IND enabling studies to support an IND for KRM II-81, our lead GABAkine, allowing the start of Phase 1 clinical trials in 2023.

And to our shareholders and stakeholders we are grateful for your support and look forward to a successful 2022.

Sincerely,

Arnold S. Lippa, PhD
Interim President, Interim Chief Executive Officer, Executive Chairman and Chief Scientific Officer

About RespireRx Pharmaceuticals Inc.

RespireRx Pharmaceuticals Inc. is a leader in the discovery and development of medicines for the treatment of psychiatric and neurological disorders, with a focus on treatment options that address conditions affecting millions of people, but for which there are few or poor treatment options, including obstructive sleep apnea ("OSA"), attention deficit hyperactivity disorder ("ADHD"), epilepsy, chronic pain and recovery from spinal cord injury ("SCI"), as well as certain neurological orphan diseases. RespireRx is developing a pipeline of new and re-purposed drug products based on our broad patent portfolios for two drug platforms: (i) pharmaceutical cannabinoids, which

include dronabinol, a synthetic form of Δ9-tetrahydrocannabinol ("Δ9-THC") that acts upon the nervous system's endogenous cannabinoid receptors and (ii) neuromodulators, which include AMPAkines and GABAkines, proprietary chemical entities that positively modulate (positive allosteric modulators or "PAMs") AMPA-type glutamate receptors and $GABA_A$ receptors, respectively.

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.

ResolutionRx: Pharmaceutical Cannabinoids.

Dronabinol. The ResolutionRx business unit of RespireRx is developing dronabinol, Δ-9-THC, a synthetic version of the naturally occurring substance in the cannabis plant, for the treatment of OSA, a serious respiratory disorder that impacts an estimated 29.4 million people in the United States according to the American Academy of Sleep Medicine ("AASM"), published in August 2016. OSA has been linked to increased risk for hypertension, heart failure, depression, and diabetes, and has an annual economic cost in the United States of $162 billion according to the AASM. There are no approved drug treatments for OSA.

Two Phase 2 clinical trials have been completed demonstrating the ability of dronabinol to significantly reduce the symptoms of OSA and, subject to raising sufficient financing (of which no assurance can be provided) and pending the outcome of an intended meeting with the FDA, RespireRx believes that it will be able to commence pharmacokinetic studies of recently developed formulations, from which one will be selected for a Phase 3 clinical study for the treatment of OSA. Because dronabinol is already FDA approved for the treatment of AIDS related anorexia and chemotherapy induced nausea and vomiting, the Company further believes that its re-purposing strategy would only require approval by the FDA of a 505(b)(2) new drug application ("NDA"), an efficient regulatory pathway that allows the use of publicly available data.

EndeavourRx: Neuromodulators

GABAkines. Under a License Agreement with the University of Wisconsin-Milwaukee Research Foundation, Inc. ("UWMRF"), the EndeavourRx business unit of RespireRx has licensed rights to certain selectively acting GABAkines because of their ability to selectively amplify inhibitory neurotransmission at a highly specific, subset of $GABA_A$ receptors, thus producing a unique efficacy profile with reduced side effects. Preclinical studies have documented their efficacy in a broad array of animal models of interrelated neurological and psychiatric disorders including epilepsy, pain, anxiety, and depression in the absence of or with greatly reduced propensity to produce sedation, motor impairment, tolerance, dependence and abuse. The Company currently is focusing on developing KRM II-81 for the treatment of epilepsy and pain.

KRM II-81 has displayed a high degree of anti-convulsant activity in a broad range of preclinical studies, including in treatment resistant and pharmaco-resistant models. Not only was KRM II-81 highly effective in these models, but pharmaco-resistance or tolerance did not develop to its anti-convulsant properties. These latter results are particularly important because pharmaco-resistance occurs when medications that once controlled seizures lose efficacy as a result of chronic use and

it is a principal reason some epileptic patients require brain surgery to control their seizures. In support of its potential clinical efficacy, translational studies have demonstrated the ability of KRM II-81 to dramatically reduce epileptiform electrical activity when administered in situ to brain slices excised from treatment resistant epileptic patients undergoing surgery.

In addition, KRM II-81 has displayed a high degree of analgesic activity in a broad range of preclinical studies. In intact animal models of acute and chronic pain, the analgesic efficacy of KRM II-81 was comparable to or greater than commonly used analgesics. At the same time, KRM II-81 did not display side effects such as sedation and motor impairment, but even more importantly, it did not produce tolerance, dependence, respiratory depression or behavioral changes indicative of abuse liability, which are produced by opioid narcotics and are at the heart of the opioid epidemic.

AMPAkines. 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 may have clinical application in the treatment of CNS-driven neurobehavioral and cognitive disorders, spinal cord injury, neurological diseases, and certain orphan indications. Our lead clinical compounds, CX717 and CX1739, have successfully completed multiple Phase 1 safety trials. Both compounds have also completed Phase 2 proof of concept trials demonstrating target engagement, by antagonizing the ability of opioids to induce respiratory depression.

AMPAkines have demonstrated positive activity in animal models of ADHD, results that have been extended translationally into statistically significant improvement of symptoms observed in a Phase 2 human clinical trial of CX717 in adults with ADHD. Statistically significant therapeutic effects were observed within one week. We believe AMPAkines may represent a novel, non-stimulant treatment for ADHD with a more rapid onset of action than alternative non stimulants, such as Straterra® (atomoxetine), and without the drawbacks of amphetamine-type stimulants.

In a series of important studies funded by grants from the National Institutes of Health and published in a number of peer reviewed articles, Dr. David Fuller (University of Florida), a long-time RespireRx collaborator, has demonstrated the ability of CX1739 and CX717, the Company's lead AMPAkines, to improve motor nerve activity and muscle function in animal models of spinal cord injury.

Additional information about RespireRx 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.

Not a Securities Offering or Solicitation

This communication shall not constitute an offer to sell or the solicitation of an offer to buy any securities, nor shall there be any sales of securities in any jurisdiction in which such offer, solicitation or sale of securities would be unlawful before registration or qualification under the laws of such jurisdiction.

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, as amended (the "Securities Act") and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the Company intends that such forward-looking statements be subject to the safe harbor created thereby. These might include statements regarding the Company's future plans, targets, estimates, assumptions, financial position, business strategy and other plans and objectives for future operations, and assumptions and predictions about research and development efforts, including, but not limited to, preclinical and clinical research design, execution, timing, costs and results, future product demand, supply, manufacturing, costs, marketing and pricing factors.

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

These factors include but are not limited to, regulatory policies or changes thereto, available cash, research and development results, issuance of patents, competition from other similar businesses, interest of third parties in collaborations with us, and market and general economic factors, and other risk factors disclosed in "Item 1A. Risk Factors" in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2020, as filed with the SEC on April 15, 2021 (the "2020 Form 10-K").

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

We caution investors, as well as potential collaborators and other potential stakeholders, not to place undue reliance on any forward-looking statement that speaks only as of the date made and to recognize that forward- looking statements are predictions of future results, which may not occur as anticipated. Actual results could differ materially from those anticipated in the forward-looking statements and from historical results, due to the risks and uncertainties described in the 2020 Form 10-K and in this press release, as well as others that we may consider immaterial or do not anticipate at this time. These forward-looking statements are based on assumptions regarding the Company's business and technology, which involve judgments with respect to, among other things, future scientific, economic, regulatory and competitive conditions, collaborations with third parties, and future business decisions, all of which are difficult or impossible to predict accurately and many of which are beyond the Company's control. Although we believe that the expectations reflected in our forward-looking statements are reasonable, we do not know whether our expectations will prove correct. Our expectations reflected in our forward-looking statements can be affected by inaccurate assumptions that we might make or by known or unknown risks and uncertainties, including those described in the 2020 Form 10-K and in this press release. These risks and uncertainties are not exclusive and further information concerning us and our business, including factors that potentially could materially affect our financial results or condition, may emerge from time to time.

For more information about the risks and uncertainties the Company faces, see "Item 1A. Risk Factors" in our 2020 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. We advise investors,

as well as potential collaborators and other potential stakeholders, to consult any further disclosures we may make on related subjects in our annual reports on Form 10-K and other reports that we file with or furnish to the SEC.

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