# PharmaDrug Advances Product and Clinical Development of Cepharanthine to Treat Rare Cancers and Infectious Diseases

Toronto, Ontario--(Newsfile Corp. - April 20, 2021) - PharmaDrug Inc. (CSE: BUZZ) (OTC Pink: LMLLF) ("**PharmaDrug**" or the "**Company**"), a specialty pharmaceutical company focused on the research, development and commercialization of controlled-substances and natural medicines such as psychedelics, cannabis and naturally-derived approved drugs, is pleased to announce that the Company has entered into an agreement with Southwest Research Institute® ("SwRI®"), to initiate non-clinical and clinical manufacturing of Cepharanthine for the Company's rare cancer and infectious diseases programs.

In connection with PharmaDrug's recent acquisition of Sairiyo Therapeutics Inc., the Company has secured an exclusive license from SwRI to develop and commercialize a novel oral formulation of Cepharanthine for all fields of use as well as exclusive rights to U.S. Patent: 10,576,077, titled "Pharmaceutical Salt forms of Cepharanthine and Tetrandrine". Formalization of the current relationship will allow PharmaDrug to expedite development timelines by leveraging SwRI's existing Cepharanthine preclinical data sets and considerable manufacturing know-how.

Cepharanthine is a natural product and an approved drug used for more than 70 years in Japan to successfully treat a variety of acute and chronic diseases. In clinical research, Cepharanthine has been shown to exhibit multiple pharmacological properties including anti-oxidative, anti-inflammatory, immuno-regulatory, anti-cancer, anti-viral and anti-parasitic properties[1]. However, historically Cepharanthine's low oral bioavailability has represented a major obstacle to realizing its full clinical potential.

The Company is focused on advancing the clinical development of an improved oral formulation of Cepharanthine to treat rare cancers and infectious diseases. Compared to generic Cepharanthine, PharmaDrug's novel formulation has been shown in rodent and non-rodent models to possess markedly superior bioavailability (more easily absorbed). These findings support the development of an orally administered formulation, and in so doing, removes the undesirable requirement for frequent intravenous dosing.

**Cepharanthine and Cancer**

The antineoplastic properties of Cepharanthine are widely described in peer reviewed literature[1,2]. Based on compelling preclinical data in esophageal cancer and a streamlined path to approval which comes by way of a recently granted FDA Orphan Drug Designation, the Company continues its plans to pursue Cepharanthine for this indication. In parallel, the Company will initiate high throughput studies to screen a large panel of additional cancers with the aim of identifying additional types of cancer sensitive to the effects of Cepharanthine-alone (monotherapy), or when combined with first and second-line chemotherapy drugs. It is expected that these studies will provide the mechanistic understanding to rationally define a clinical lead program in oncology while also affording the opportunity to secure additional intellectual property around novel findings.

**Cepharanthine and COVID-19**

Recently, to rapidly identify drug candidates and provide patients with 'off the shelf' treatments for COVID-19, two independent research groups screened approximately 3,000 already approved agents in differing cell culture models of SARS-CoV-2 infection[3,4] and have recently published the results. In both cases, Cepharanthine was identified as the most promising lead; showing greater potency at inhibiting infection than existing clinical development candidates remdesivir and chloroquine[3]. Moreover, Cepharanthine was also found to block viral cell entry of lab-attenuated SARS-CoV and the virus that

causes Middle East respiratory syndrome (MERS)[4]. The anti-viral mechanism of action for Cepharanthine is mediated primarily through direct binding to the virus spike protein; the presence of which is required for viral entry into the cell. The authors note that while interesting, the poor oral bioavailability of generic Cepharanthine would necessitate intravenous administration and would limit patient access[3]. The Company intends to capitalize on these findings by evaluating the benefit of their novel oral formulation of Cepharanthine in an animal model of SARS-CoV-2 infection. As a potential oral antiviral therapeutic agent to treat mild-moderate COVID-19, the Company will proceed to initiate discussions with health regulators, such as the FDA and Health Canada, to determine the appropriate next steps to advance to human clinical studies that would position Cepharanthine as a potential first-in-class therapeutic against coronaviruses and future pandemics.

Daniel Cohen, CEO of PharmaDrug commented, "We are extremely excited about Cepharanthine and its immense potential. We are working diligently to advance the drug for Esophageal cancer while simultaneously assessing its potential in other rare cancers. We are also determining our mode of action relating to the drug's apparent potential in treating COVID-19."

The Company would like to make it clear that is not making any express or implied claims that its product (Cepharanthine) has the ability to treat, eliminate or cure COVID-19 (SARS-2 Coronavirus) and/or other infectious diseases at this time.

**About PharmaDrug Inc.**

PharmaDrug is a specialty pharmaceutical company focused on the research, development and commercialization of controlled-substances and natural medicines such as psychedelics, cannabis and naturally-derived approved drugs. The Company owns 80% of Pharmadrug Production GmbH, a German medical cannabis distributor, with a Schedule I European Union narcotics license and German EuGMP certification allowing for the importation and distribution of medical cannabis to pharmacies in Germany and throughout the EU. The Company also owns 100% of Super Smart, a Dutch company building a modern adult use psychedelic retail business with an elevated and educational focus. PharmaDrug recently acquired Sairiyo Therapeutics, a biotech company that specializes in researching and reformulating established natural medicines with a goal of bringing them through regulatory and research driven clinical trials.

For further information, please contact:

Daniel Cohen, Chairman and CEO
dcohen@pharmadrug.co
(647) 202-1824

Caution Regarding Forward-Looking Information:

THE CANADIAN SECURITIES EXCHANGE HAS NOT REVIEWED NOR DOES IT ACCEPT RESPONSIBILITY FOR THE ADEQUACY OR ACCURACY OF THIS RELEASE.

*This press release contains "forward-looking information" within the meaning of applicable securities legislation. All statements, other than statements of historical fact, included herein are forward-looking information. Generally, forward-looking information may be identified by the use of forward-looking terminology such as "plans", "expects" or "does not expect", "proposed", "is expected", "budgets", "scheduled", "estimates", "forecasts", "intends", "anticipates" or "does not anticipate", or "believes", or variations of such words and phrases, or by the use of words or phrases which state that certain actions, events or results may, could, would, or might occur or be achieved. In particular, this press release contains forward-looking information in relation to: the timing of the proposed non-clinical and clinical manufacturing of Cepharanthine for the Company's rare cancer and infectious diseases programs; the ability to expedite development timelines by leveraging SwRI's existing Cepharanthine preclinical data sets and manufacturing know-how; the ability to advance clinical development of an*

*improved oral formulation of Cepharanthine to treat rare cancers and infectious diseases; the ability to obtain applicable approval for the use of Cepharanthine to treat esophageal cancer; the timing and potential results of the Company's plan to initiate high throughput studies to screen a large panel of additional cancers; the Company's plans to evaluate the benefit of its novel oral formulation of Cepharanthine in an animal model of SARS-CoV-2 infection and its proposed discussions with regulators regarding same. This forward-looking information reflects the Company's current beliefs and is based on information currently available to the Company and on assumptions the Company believes are reasonable. These assumptions include, but are not limited to the ability of the Company to successfully execute on its plans for the Company and Sairiyo; the ability to complete the studies referenced herein nd the results thereto; the ability to obtain required regulatory approvals and the Company's continued response and ability to navigate the COVID-19 pandemic being consistent with, or better than, its ability and response to date.*

*Forward-looking information is subject to known and unknown risks, uncertainties and other factors that may cause the actual results, level of activity, performance or achievements of the Company to be materially different from those expressed or implied by such forward-looking information. Such risks and other factors may include, but are not limited to: general business, economic, competitive, political and social uncertainties; general capital market conditions and market prices for securities; the actual results of the Company's future operations; competition; changes in legislation affecting the Company; the ability to obtain and maintain required permits and approvals, the timing and availability of external financing on acceptable terms; lack of qualified, skilled labour or loss of key individuals; risks related to the COVID-19 pandemic including various recommendations, orders and measures of governmental authorities to try to limit the pandemic, including travel restrictions, border closures, non-essential business closures, service disruptions, quarantines, self-isolations, shelters-in-place and social distancing, disruptions to markets, economic activity, financing, supply chains and sales channels, and a deterioration of general economic conditions; and a deterioration of financial markets that could limit the Company's ability to obtain external financing.*

*A description of additional risk factors that may cause actual results to differ materially from forward-looking information can be found in the Company's disclosure documents on the SEDAR website at www.sedar.com. Although the Company has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking information, there may be other factors that cause results not to be as anticipated, estimated or intended. Accordingly, readers should not place undue reliance on forward-looking information. Readers are cautioned that the foregoing list of factors is not exhaustive. Readers are further cautioned not to place undue reliance on forward-looking information as there can be no assurance that the plans, intentions or expectations upon which they are placed will occur. Such information, although considered reasonable by management at the time of preparation, may prove to be incorrect and actual results may differ materially from those anticipated.*

*The Company's securities have not been registered under the U.S. Securities Act of 1933, as amended (the "U.S. Securities Act"), or applicable state securities laws, and may not be offered or sold to, or for the account or benefit of, persons in the United States or "U.S. Persons", as such term is defined in Regulations under the U.S. Securities Act, absent registration or an applicable exemption from such registration requirements. This press release shall not constitute an offer to sell or the solicitation of an offer to buy nor shall there be any sale of the securities in the United States or any jurisdiction in which such offer, solicitation or sale would be unlawful.*

*Forward-looking information contained in this press release is expressly qualified by this cautionary statement. The forward-looking information contained in this press release represents the expectations of the Company as of the date of this press release and, accordingly, are subject to change after such date. However, the Company expressly disclaims any intention or obligation to update or revise any forward-looking information, whether as a result of newinformation, future events*

*or otherwise, except as expressly required by applicable securities law.*

*References:*

1) Bailly C. Cepharanthine: An update of its mode of action, pharmacological properties and medical applications. Phytomedicine. 2019 Sep;62:152956. doi: 10.1016/j.phymed.2019.152956. Epub 2019 May 10. PMID: 31132753; PMCID: PMC7126782.

2) Rogosnitzky M, Danks R. Therapeutic potential of the biscoclaurine alkaloid, cepharanthine, for a range of clinical conditions. Pharmacol Rep. 2011;63(2):337-47. doi: 10.1016/s1734-1140(11)70500-x. PMID: 21602589.

3) Ohashi H, Watashi K, Saso W, Shionoya K, Iwanami S, Hirokawa T, Shirai T, Kanaya S, Ito Y, Kim KS, Nomura T, Suzuki T, Nishioka K, Ando S, Ejima K, Koizumi Y, Tanaka T, Aoki S, Kuramochi K, Suzuki T, Hashiguchi T, Maenaka K, Matano T, Muramatsu M, Saijo M, Aihara K, Iwami S, Takeda M, McKeating JA, Wakita T. Potential anti-COVID-19 agents, cepharanthine and nelfinavir, and their usage for combination treatment. iScience. 2021 Apr 23;24(4):102367. doi: 10.1016/j.isci.2021.102367. Epub 2021 Mar 26. PMID: 33817567; PMCID: PMC7997640.

4) Chen CZ, Xu M, Pradhan M, Gorshkov K, Petersen JD, Straus MR, Zhu W, Shinn P, Guo H, Shen M, Klumpp-Thomas C, Michael SG, Zimmerberg J, Zheng W, Whittaker GR. Identifying SARS-CoV-2 Entry Inhibitors through Drug Repurposing Screens of SARS-S and MERS-S Pseudotyped Particles. ACS Pharmacol Transl Sci. 2020 Oct 19;3(6):1165-1175. doi: 10.1021/acsptsci.0c00112. PMID: 33330839; PMCID: PMC7586456.


To view the source version of this press release, please visit
https://www.newsfilecorp.com/release/80926