PharmaTher Provides Product Pipeline Updates and Anticipated Milestones for Q4-2021 and 2022

- *10 clinical sites selected to participate in the FDA Phase 2 clinical study evaluating ketamine for the treatment of Parkinson's Disease*
- *Initiated investigational new drug (IND) application to proceed to a Phase 2 clinical study for KETABET™ to treat depression*
- *Completed Phase 2 clinical study protocol for ketamine to treat ALS for IND submission to the FDA*
- *Near completion of research programs to advance novel microneedle patches for the delivery of psychedelics*
- *Selected U.S.-based CDMO to develop and supply proprietary ketamine products for FDA Phase 3 clinical studies and commercialization*
- *Positioned ketamine focused product pipeline for potential Phase 3 clinical studies and commercial supply in 2022*

TORONTO, Sept. 13, 2021 (GLOBE NEWSWIRE) -- PharmaTher Holdings Ltd. (the "Company" or "PharmaTher") (OTCQB: PHRRF) (CSE: PHRM), a clinical-stage psychedelics biotech company, is pleased to provide a product pipeline update and anticipated milestones for Q4-2021 and 2022 including ongoing FDA Phase 2 clinical study programs, microneedle patch delivery programs for psychedelics, and clinical, commercial manufacturing and supply for its proprietary ketamine and microneedle patch products.

Fabio Chianelli, Chief Executive Officer of PharmaTher, said, "I am very pleased with the progress of our clinical programs for ketamine as a potential treatment for Parkinson's disease, ALS and depression. Our research programs for microneedle patch delivery are nearing completion and preparations for FDA Phase 1 and 2 clinical studies are on track. To support these and future programs, we are securing manufacturing and supply of our proprietary ketamine products and microneedle patches for planned FDA Phase 2 and 3 clinical studies and commercialization in 2022 and beyond. We remain focused on achieving our milestones in Q4-2021 and building a solid foundation that will allow us to become a leader in the development and commercialization of novel ketamine-based products. In addition, our intradermal delivery of ketamine and psychedelics via our proprietary microneedle patches position us for potential next-generation therapeutic solutions for mental health, neurological and pain disorders."

FDA Phase 2 Clinical Study Programs

For the rest of 2021, PharmaTher will focus on advancing three promising developments through FDA Phase 2 clinical studies:

Ketamine for Parkinson's Disease

The FDA's approval to proceed with a Phase 2 clinical trial to evaluate the safety, efficacy and pharmacokinetics of ketamine in the treatment of levodopa-induced dyskinesia in patients with Parkinson's disease triggered clinical program execution. The Company has completed its clinical trial start-up activities and selection of essential vendors including project management, central laboratory, clinical supply kits and logistics, data management and biostatistics, and clinical site management and monitoring. Clinical trial drug product (ketamine) and active placebo (midazolam) have also been obtained.

More importantly, the Company has selected ten (10) clinical sites in the U.S. to participate in the Phase 2 clinical study. Patient screening has begun and the Company expects patient enrollment to support the delivery of clinical results in Q4-2021.

For further detail about the study (ClinicalTrials.gov Identifier: NCT04912115), titled "A Multi-Center, Phase II, Randomized, Double-Blind, Prospective, Active Placebo-Controlled Trial of Sub-Anesthetic Intravenous Infusion of Ketamine to Treat Levodopa-Induced Dyskinesia in Subjects with Parkinson's Disease," please visit https://clinicaltrials.gov/ct2/show/NCT04912115?term=PharmaTher&draw=2&rank=1.

If the Phase 2 clinical study is positive, the Company will request a meeting with the FDA to discuss its plan and obtain an agreement to move to a Phase 3 clinical study under the 505(b)2 regulatory pathway in the first half of 2022.

KETABET™ for Treatment-Resistant Depression

The Company has finalized the Phase 2 clinical study protocol to evaluate KETABET™ for treatment-resistant depression. The Company is working with its scientific and clinical advisor, Dr. Maurizio Fava, MD, with the aim to complete the IND and file it with the FDA in early October. With the overlap of the clinical operations from the Parkinson's disease study, the Company has already activated start-up activities and identified potential clinical sites to screen and enroll patients for the proposed Phase 2 clinical study in Q4-2021. The aim is to share initial clinical results by the end of this year.

Assuming the Phase 2 clinical study is positive, the Company will request a meeting with the FDA to discuss its plan and obtain an agreement to move to a Phase 3 clinical study under the 505(b)2 regulatory pathway in the first half of 2022.

KETABET™ is the Company's patented combination formulation of FDA-approved ketamine and betaine as a potential next-generation treatment for neuropsychiatric disorders. More than 300 million people suffer from major depressive disorder and of

those, 100 million are resistant to available treatments worldwide. KETABET™ research has shown potential enhancement of the antidepressant effect while having the potential to significantly reduce the known negative side effects of ketamine.[1] Side effects such as hallucinations, confusion, memory loss and abuse liability compromise the compliance and potential therapeutic value of ketamine.

Ketamine for Amyotrophic Lateral Sclerosis (ALS or Lou Gehrig's Disease)

The Company has been granted orphan drug designation by the FDA for ketamine to treat ALS and along with its clinical advisors, has finalized the Phase 2 clinical study protocol. The IND application for this study is in process and will be filed with the FDA in October 2021 with patient enrollment targeting Q1-2022.

PharmaTher has an exclusive license agreement with the University of Kansas for the intellectual property protecting the potential use of ketamine to treat ALS. Preclinical research has shown that the administration of ketamine preserves muscle function in advancing ALS and could potentially increase life expectancy when given in the early stages of muscle decline.

Proprietary Microneedle Patch Delivery Programs for Psychedelics

PharmaTher is working with its research and development partners to advance next-generation microneedle patches for the delivery of psychedelics:

Hydrogel-Forming Microneedle Delivery Technology for Ketamine

PharmaTher has exclusive worldwide development and commercial rights for the delivery of ketamine, esketamine and KETABET™ using a patented hydrogel-forming microneedle patch. The Company is working with Professor Ryan Donnelly under a research agreement with The Queen's University of Belfast to develop the microneedle patch for the delivery of ketamine and KETABET™. Foundational research is almost complete and final research results will become available in December 2021. To date, initial proof of concept with ketamine and KETABET™ is very encouraging. The Company is currently preparing for validation and tech transfer activities to support Phase 1 and Phase 2 clinical studies in 2022. Development progress will be made available as they arise for the remainder of the year.

The Company's microneedle patch leverages the successful proof of concept achieved in delivering esketamine, the S(+) enantiomer of ketamine, via the microneedle patch, which may overcome the drawbacks associated with ketamine administration in an intravenous or nasal spray format.[2] Details of the research can be found in a published paper titled "Hydrogel-forming microneedle arrays as a therapeutic option for transdermal esketamine delivery."

GelMA Microneedle Delivery Technology for Psychedelics

The Company is working with the Terasaki Institute under a research agreement to finalize the development of a proprietary microneedle delivery technology comprised of a biocompatible and biodegradable gelatin methacryloy (GelMA) composite for use with psychedelics such as psilocybin, DMT, MDMA and LSD. The GelMA patch delivery technology is the driving force of the Company's psychedelics microdosing program. The research program is almost complete and successful proof of concept with psilocybin and LSD has been achieved. Full research results will be made available in November 2021. The Company is currently preparing for validation and tech transfer activities to support Phase 1 and Phase 2 clinical studies in 2022.

Clinical and Commercial Manufacturing and Supply Initiatives

Proprietary Ketamine

PharmaTher is focused on building a specialty ketamine-based product pipeline. The Company has selected a U.S.-based GMP contract development and manufacturing organization (CDMO) with extensive experience in the development, production and supply of clinical and commercial controlled substance sterile products. PharmaTher will work with the CDMO to develop the Company's proprietary ketamine drug product(s) to support future clinical studies and global commercial supply.

It is expected that the proprietary ketamine drug products will be available for FDA Phase 3 clinical studies and commercialization in H2-2022.

Proprietary Microneedle Patch

The Company entered into a co-development agreement with TSRL, Inc. to jointly develop the patented hydrogel-forming microneedle patch delivery technology. This allows the Companies to control the manufacturing and supply of microneedle patches for their respective clinical and commercial drug programs.

PharmaTher is focused on incorporating psychedelics and TSRL is focused on incorporating antiviral medications in a microneedle patch with the potential to improve the safety (i.e. fewer side effects), efficacy (i.e. bioavailability, optimized dosing regimen including continuous system delivery) and compliance (i.e. storage, distribution and self-administration) of these compounds that currently must be taken orally, inhaled, injected and intravenously.

Recent activities included the tech transfer for scale-up and manufacturing of clinical supplies to a GMP contract research lab and a pre-IND meeting with the FDA that achieved agreement with the agency on proposed 505(b)2 product development plans.

The Company aims to validate non-clinical and clinical production of the microneedle patch by October 2021 and begin non-clinical and clinical manufacturing supply at the end of 2021. The Company expects to enter into Phase 1 and 2 clinical studies in 2022 to evaluate its microneedle patch in delivering ketamine, KETABET™, psilocybin, DMT, MDMA and LSD.

About PharmaTher Holdings Ltd.

PharmaTher Holdings Ltd. (OTCQB: PHRRF) (CSE: PHRM) is a clinical-stage psychedelics biotech company focused on the research, development and commercialization of novel uses, formulations and delivery methods of psychedelics, including ketamine, to treat mental health, neurological and pain disorders. PharmaTher is currently conducting an FDA approved phase 2 clinical study with ketamine to treat Parkinson's disease and is developing novel microneedle patches for the intradermal delivery of psychedelics.

Learn more at: **PharmaTher.com** and follow us on **Twitter** and **LinkedIn**.

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References:

1. *J.-C. Lin, M.-Y. Lee, M.-H. Chan, Y.-C. Chen, H.-H. Chen, Betaine enhances antidepressant-like, but blocks psychotomimetic effects of ketamine in mice, Psychopharmacology (Berl). 233 (2016) 3223–32.*
2. *Courtenay, et al. Hydrogel-forming microneedle arrays as a therapeutic option for transdermal esketamine delivery, Journal of Controlled Release, Volume 322, 2020, Pages 177-186.*