



PharmAust and Leiden University Evaluate Monepantel Suitability for *Ex-Vivo* Human COVID-19 Testing

- PharmAust will provide monepantel and monepantel sulfone to Leiden University Medical Center where their ability to inhibit SARS-CoV-2 infection will be evaluated with the intention to analyse their effect in *ex-vivo* human SARS-CoV-2 infection models
- Study will be overseen by Dr Martijn van Hemert, Principal Investigator of Anti-viral Drug Development
- Final data report expected in December

24 September 2020 – Perth, Australia: PharmAust Ltd (ASX:PAA), a clinical-stage oncology company, has entered into a Service Agreement with Leiden University Medical Center (LUMC) in the Netherlands for LUMC to test the effects of monepantel and monepantel sulfone on the replication of SARS-CoV-2 in cell lines. The purpose is to determine their applicability for testing these compounds in *ex-vivo* human SARS-CoV-2 infection models (cultured human airway epithelial tissue).

The Agreement provides that PharmAust will pay a fee to LUMC and will own all intellectual property results generated from the study.

COVID-19 is an infectious disease pandemic caused by the newly discovered SARS-CoV-2 coronavirus. Many vaccines and anti-viral medications are under development worldwide, yet cures and effective remedies remain undiscovered to date. Drug development in this field generally commences with simple *in vitro* cell line-based tests and then progresses, for example, to more complicated *ex-vivo* human organoid lung tissue testing before being considered for clinical trials. Human lung organoids can be generated directly from *ex-vivo* human tissue or constructed from stem cell cultures in complicated, labour-intensive and specialised experiments.

Compared to two-dimensional cell line cultures, organoids more closely recapitulate the natural tissue's three-dimensional structure. They provide a greater functional, physiological and pathological relevance for evaluating potential antiviral drugs against SARS-CoV-2. The cell line work planned here is transitional to that previously conducted by PharmAust, providing evidence to directly determine the applicability of monepantel testing in organoid work as a next step.

This work will be overseen by molecular virologist Professor Martijn van Hemert, Principal Investigator of Antiviral Drug Development at LUMC. Professor van Hemert has been studying emerging RNA viruses like SARS-CoV, chikungunya virus and Zika virus for over 15 years. His research is mainly focussed on the replication of these viruses, their interaction with the host and strategies to inhibit virus replication (antivirals). Since the beginning of 2020 his work has almost exclusively focussed on the SARS-CoV-2, in particular on the development and testing of antivirals.

PharmAust's Chief Scientific Officer Dr Richard Mollard stated "The studies will commence shortly and LUMC aims to provide the final data report in December this year."

This announcement is authorised by the Board

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About PharmAust (PAA):

PAA is a clinical-stage company developing targeted cancer therapeutics for humans and animals. The company specialises in repurposing marketed drugs lowering the risks and costs of development

PAA's lead drug candidate is monepantel (MPL), a novel, potent and safe inhibitor of the mTOR pathway – a key driver of cancer. MPL has been evaluated in Phase 1 clinical trials in humans and dogs; was well tolerated and produced a significant reduction in key prognostic biomarkers. PAA is uniquely positioned to commercialise MPL for treatment of human and veterinary cancers as it advances the drug in Phase 2 clinical trials.

About Leiden University Medical Center (LUMC):

Leiden University Medical Center (7,000 employees, >700 million annual turnover) is a modern and internationally renowned biomedical research center. LUMC integrates research, education and patient care with a high-quality profile and a strong scientific orientation, ranging from basic to applied and clinical research. LUMC offers state-of-the-art research facilities to contribute to innovation and scientific research, i.e. Leiden Genome Technology Center, Flow Cytometry Core Facility, Center for Proteomics and Metabolomics, Light and Electron Microscopy, Bioinformatics - Data Analytics - Computational Biology, GMP-facility, Leiden Stem Cell Hotel, Central Animal and Transgenic Facility, Preclinical Imaging Facility, Biosafety level-3 Facility, and Biobank Facility.

The Molecular Virology team (~35 scientific and supporting staff members) of the LUMC department of Medical Microbiology studies the molecular biology of +RNA virus replication and uses this knowledge to develop novel antiviral strategies. The group has worked on coronaviruses for over 30 years and was and is deeply involved in the characterisation of the emerging SARS- and MERS-coronaviruses in 2003 and 2012, and SARS-CoV-2 since the beginning of 2020. Key contributions were made to the functional characterization of the coronavirus replicative enzymes, RNA synthesis, replication organelles and innate immune evasion strategies. Moreover, the group has identified and studied the mechanism-of-action of a wide variety of compounds with antiviral activity.