**Targeted Pharmaceuticals and George Mason University Announce *First-Ever* Preclinical Study using Cannabinoids in an Organoid Model**

*Study Examines the Effects of Cannabinoids Treating Central Nervous System (CNS) Viruses including HIV Associated Dementia.*

Worcester Massachusetts, June 16th, 2021, Targeted Pharmaceuticals a leading cannabinoid-based drug discovery company announced today, it has commenced the *first-ever*, preclinical studying use cannabinoids in a viral infected organoid model in collaboration with George Mason University. The study advances the previous work whereby cannabinoids had a significant reduction extracellular vesicles (EVs) from the infected cells with promising results from HIV-associated neurocognitive disorders (HAND) and depression which are commonly linked with HIV-1 infection.

As of today, approximately 18 million of the estimated 37 million people living with HIV globally are receiving combination antiretroviral therapy (cART), which can produce viral RNAs and proteins and ultimately induce neurocognitive disorders and dementia which there is no cure.

“These studies are significant in that cannabinoids may provide a protective effect by alleviating the pathogenic effects of EVs in HIV-1 and CNS-related infections,” commented Dr. Fatah Kashanchi, Professor and Director at the George Mason University's Laboratory of Molecular Virology Lab. “Our data suggests that certain cannabinoids, such as CBD and THC can act as viral transcription inhibitors, potentially through two independent mechanisms and provide significant reduction in EVs released from infected cells”, stated Dr. Kashanchi.

Despite decades of research and development of this complex drug treatment, which is effective in the prevention of new infections, cells with an integrated HIV-1 genome have leaky transcription leading to neurocognitive disorders. These viral products can then be packaged into extracellular vesicles (EVs) and released from the infected cell.

In addition, HIV-1 remains an incurable infection that is associated with substantial economic and epidemiologic impacts. HIV-associated neurocognitive disorders (HAND) are commonly linked with HIV-1 infection; despite the development of combination antiretroviral therapy (cART), HAND is still reported to affect at least 50% of HIV-1 infected individuals. It is believed that the over-amplification of inflammatory pathways, along with release of toxic viral proteins from infected cells, are primarily responsible for the neurological damage that is observed in HAND; however, the underlying mechanisms are not well-defined. Therefore, there is an unmet need to develop more physiologically relevant and reliable platforms for studying these pathologies.

Previous studies have shown that marijuana use in people living with HIV is associated with a lower viral load and high CD4+ T-cell count, suggesting a potential therapeutic application. The collaboration between Targeted Pharmaceuticals, investigated the effects of cannabinoids, CBD and THC, on viral transcription in HIV-1 infected cells and resulting changes in EV release.

“It is exciting to see the progress Targeted Pharmaceutical and George Mason University are making in this new frontier of cannabinoid-based therapies”, commented Dr. Lance Liotta, MD, Co-Director and Co-Founder of the Center for Applied Proteomics and Molecular Medicine at George Mason University

 “We are seeing very promising results using cannabinoids as both a standalone agents and in combination therapies to prevent and/or treat central nervous system viruses and several cancers”, stated Liotta.

In addition to developing novel cannabinoid-based therapies for related to CNS, Targeted Pharmaceuticals is also collaborating with Tetra Bio Pharma, Inc. (TSX: TBP) and formed a partnership leverage Tetra’s inhalation intellectual property and its immunomodulatory ARDS-003 drug.

Dr. Guy Chamberland, Chief Executive Officer and Chief Regulatory Officer of Tetra Bio-Pharma stated, “We are very fortunate to have created a partnership with Targeted Pharmaceutical. We hope this partnership will lead to new market opportunities for both corporations as we leverage our THC and CBD inhalation intellectual property as well as that of immunomodulatory ARDS-003 drug. This relationship is based on having access to first class antiviral and CNS research with international and pharmaceutical industry recognition. Rapid delivery of cannabinoids to the brain by inhalation is a key therapeutic advantage specially when higher doses can be administered to patients because of the safer metabolite profile.”