Title: Molecular mechanisms of SDAV (Sialodacryoadenitis Virus) neuropathogenicity in an *in vitro* primary cell culture model of the central nervous system - preliminary research

The ongoing pandemic has demonstrated, once again, the role of the *Coronaviridae* family as an extremely dangerous etiological agent of human zoonoses. High genetic variability and the ability to mutate in the genome have led to rapid adaptation and transmission of coronaviruses in new hosts and new strains under diverse environmental conditions. This project aims to study the molecular mechanisms of neurotropism and neuropathogenicity of rat coronavirus (SDAV- Sialodacryoadenitis Virus) on an *in vitro* model - primary culture of mouse neurons, astrocytes and microglia.

This virus is the etiological agent causing frequent infections in laboratory rats. Until now, its role has only been considered in studies on respiratory infections. The scanty literature data, consisting mainly of data from the last century, did not sufficiently address the topic of infection in the central nervous system. So far, the mechanisms of entry, replication, and release of SDAV progeny virions from the central nervous system cells have not been determined. It is worth noting here that the main host of the infection is the rat, as mentioned above. Rats inhabit large urban agglomerations, causing a vast epidemic threat. Of the 2277 existing rodent species, 217 species are reservoirs for 66 zoonotic diseases caused by viruses, bacteria, fungi and protozoa. Unlike the most commonly identified SARS-CoV-2 vector, the bat rats are abundant worldwide and should also be kept in mind as a potential threat. Additionally, the fact that the facilitated ability of coronaviruses to cross the species barrier and change hosts commonly found in close proximity to humans highlights the need for research into the characterisation of SDAV infections.

The project results would make it possible to add to the knowledge of the interaction of rat coronavirus with cells of the central nervous system. The potential changes that will occur in the cytoskeleton of the three nerve cell populations and the knowledge of the virus replication pathways will become an essential addition to the knowledge of the pathogenicity of SDAV. In addition, this project would be a crucial contribution to the "One Health Approach" concept, one of which aims to prevent zoonoses.