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Equine herpesvirus study to unravel how virus unlocks immune system 'gate'

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A Colorado State University study will look at how equine herpesvirus type 1 may compromise the immune system immediately upon entering the “gate” of a horse’s respiratory system – the airway and throat – allowing it to spread through the body and potentially cause neurological damage, abortion and possibly death.

The study specifically concentrates on the lining of the respiratory systems, called the epithelium, which keeps the airway moist and is a barrier to pathogens. The epithelial cells also serve a critical function in shaping the immunological response, including secreting chemicals to attack pathogens and determining and initiating the cascade of immune responses in the rest of the body.

“We believe that the herpesvirus finds a way to ‘hide’ from the immune response, and we also know that if an immune system doesn’t trigger a good response at the first sign of infection, viruses like this one take off,” said Gabrielle Landolt, a CSU veterinarian and a co-lead researcher on the project. "That combination of events may take place in the horse’s respiratory system, and if we can crack the equine herpesevirus secret to getting through that gateway and compromising the immune system at that point of entry, we may be better able to find treatments and preventative measures to stop outbreaks of the virus.”

“The outcome of this research will also help scientists understand how herpes viruses in all species may impact immune systems,” said Gisela Hussey, also a veterinarian at CSU, who is leading the project. “This

study is innovative because it is the first study to focus on defining the immune responses at the respiratory epithelium and how the virus controls the immune system."

Equine herpesevirus-1 is spread through nose-to-nose contact and through close contact with contaminated equipment, clothing and water and feed. The pathogen also may spread for a limited distance through the air. There are several types of equine herpesevirus, and there also are herpes strains that impact virtually every species. However, the virus does not jump from species to species.

The researchers are conducting the study on actual equine epithelium cells from deceased horses whose owners have volunteered the tissue for the research. The use of these cells in a model that mimics the actual response in a living horse also is novel in this research area.

Provided by Colorado State University