RESEARCH ABSTRACT

SWINE HEALTH

Title: Investigating the effect of stressors on Senecavirus A pathogenesis and the potential occurrence of the "carrier state" in sows **(NPB #17-216)**

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Date Submitted: 04/06/2019

Scientific Abstract:
Senecavirus A (SVA) is an emerging picornavirus that causes FMDV-like vesicular disease in pigs. Despite its clinical relevance due to its similary with FMD, several aspects of SVA infection biology and interactions with the swine host remain unknown. Here we assessed the effect of stressors on SVA-induced VD disease severity and investigated the occurrence of persistent SVA infection. The study was divided in two phases: i. phase I or acute infection; and phase II or chronic/persistent infection. For phase I, a total of 14 sows were allocated in four experimental groups consisting of a control group (G1, n = 4), an acclimated group (G2, n = 5) and a transportation stress group (G3, n = 5). During phase I, animals were monitored every 12 hours for the first 4 days and then daily for an additional 10 days. One sow from each SVA-inoculated group was euthanized on day 42 pi. For phase II, animals from G1 (n = 4), G2 (n = 4) and G3 (n = 4) described above plus four pregnant gilts (G4, n = 4) were used to assess the occurrence of persistent infection and the potential effect of stressors on disease reoccurrence and recrudescence from virus shedding. Results here show that animals subjected to transportation stress prior to SVA infection developed lesions slightly earlier than animals subjected to acclimation. Additionally, lesions in animals subjected to transportation stress were slightly larger when compared to those observed in acclimated animals. Real-time PCR and *in situ hybridization* performed in the tonsil of animals euthanized on day 42, confirmed the presence of SVA RNA in this tissue. Additionally, animals from all groups shed SVA in feces and oral and nasal secretions up to day 35 pi. The excretion patterns were intermittent/transient. Testing performed in the tonsil of the animals at the end of the experiment on day 60 post-inoculation also demonstrated the presence of high levels of SVA RNA in this tissue. Most importantly, infectious SVA was recovered from the tissue of 2 sows on day 60 post-inoculation. These results confirm that SVA establishes persistent infection in the tonsil of infected animals. We also show that SVA induces persistent infection in infected animals and the virus that is shed by carrier animal can be transmitted infect contact piglets. These studies revealed important and new aspects of SVA infection in pigs.