

Title: Evaluation of cross-protective immunity induced by porcine intestinal mesenchymal stromal cell-adapted PEDV – **NPB #14-282**

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Scientific Abstract

Since its first detection in April, 2013, porcine epidemic diarrhea virus (PEDV) is continuing to cause colossal economic losses to the US pork industry. PEDV causes an acute enteric infection in pigs of all ages but infection is severe in suckling piglets causing up to 90-95% mortality in this age group. PEDV replicates in enterocytes of small intestine and causes diarrhea, vomiting and dehydration. Recently, variants of original virulent PEDV were also isolated in the U.S., thus making vaccine development against this devastating disease even more challenging. In this study, we attempted to generate attenuate strain of PEDV by passaging in mesenchymal stromal (stem) cells (MSCs) isolated from the duodenum of newborn piglets. We passaged virulent PEDV Kansas 14-01 in MSCs 40 times (KS-P40). Next, we examined the pathogenesis of KS-P50 in 5-day-old piglets and examined the protective efficacy of KS-P40 against a virulent PEDV challenge. Compared to virulent PEDV, KS-P40 did not cause mortality in piglets and induced milder clinical signs and diarrhea and shed lower virus and for shorter duration in feces. KS-P40 also induced serum IgG, IgA and neutralizing antibodies and protected inoculated piglets against challenge virus-induced clinical disease. However, vaccinated challenged pigs shed virus in feces albeit at lower levels compared to non-vaccinated challenged pigs. These data indicate that additional passages in MSCs are needed to obtain a complete attenuate strain.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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