

## SWINE HEALTH

**Title:** Epitope Inclusion: Enhancing porcine reproductive and respiratory syndrome virus (PRRSv) vaccine cross-protective efficacy - **NPB #14-217**

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**Date Submitted:** January 6, 2017

**Scientific Abstract:** Reproductive and Respiratory Syndrome virus (PRRSv) is a single-stranded RNA virus composed of nine open-reading frames (ORFs). The non-structural proteins are encoded in ORFs 1a and 1b and the structural proteins are encoded in ORFs 2a, 2b, and 3-7. PRRSv has been, and continues to be, an enormous economic burden to the swine industry. The genetic and antigenic variability between isolates, as well as the many mechanisms PRRSv has to alter pig immune responses, continues to make identification of correlates of protection and study of cellular immune responses quite difficult. Identification of T cell epitopes conserved across PRRSv isolates and vaccine strains, and thus comparison of T cell epitope content, provides a method to for vaccine strain selection. Our results indicate that using epitope comparison of isolates changes the phylogenetic relationship between strains, and that there is significant differences between commercially available vaccine strains and contemporary isolates of PRRSv. We used a vaccine/challenge study to validate epitope predictions, as well as capacity of epitope scores to be used in predicting protection. Vaccine immunogenicity was not optimal and difficulty in procuring pigs with specific SLA made final conclusions difficult. Our results do show some protection against viral replication of a contemporary PRRSv 174 isolate when vaccinated with a chimeric virus. Overall, validation of predicted epitopes will require a system in which PRRSv vaccination or infection is not used given the ability of PRRSv to hinder antigen presentation.

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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 This report has not been peer-reviewed.

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