

SWINE HEALTH

Title: Determine the mechanisms of cross-protection against infection with a divergent porcine reproductive and respiratory virus strain - **NPB # 14-200**

Investigator: Hiep Vu

Institution: University of Nebraska-Lincoln

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Scientific Abstract:

We have recently generated a synthetic PRRSV strain (so-called PRRSV-CON) that confers outstanding levels of heterologous protection. We report herein the use of the PRRSV-CON as gold standard to elucidate the mechanisms of cross-protection against divergent PRRSV strains. When inoculated into pigs, the PRRSV-CON seems to elicit better levels of cross-neutralizing antibodies than the PRRSV strain FL12. Cross-neutralizing antibodies were detected in 2 out of 6 pigs infected with the PRRSV-CON whereas cross-neutralizing antibodies were not detected in any of the pigs infected with the PRRSV strain FL12. We did not observe any significant difference in the levels of interferon-gamma secreting cells between pigs infected with the PRRSV-CON and those infected with FL12. Interestingly, we found that the synthetic PRRSV-CON virus can induce high levels of type-I interferons in cell culture. This observation is surprising because it has been well demonstrated that naturally occurring PRRSV actively suppress type-I interferons. We further identified that the 3.3 kb fragment at the 5' end of the PRRSV-CON, containing the non-structural protein (nsp) 1 and a part of nsp2, is responsible for the induction of type-I interferons. We are conducting experiments to determine the relationship between the viral capability of inducing type-I IFNs and the viral ability to confer protection against heterologous PRRSV strains.

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 This report has not been peer-reviewed.

For more information contact:

National Pork Board • PO Box 9114 • Des Moines, IA 50306 USA • 800-456-7675 • Fax: 515-223-2646 • pork.org
