

SWINE HEALTH

Title: *In vivo* evaluation of genetic markers in the nsp2 region of PRRSV: Implications for future recombinant marker vaccine development – **NPB #06-173**

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Scientific Abstract:

Porcine reproductive and respiratory syndrome virus (PRRSV) continues to be a major problem in the pork industry worldwide. The limitations of current PRRSV vaccines require the development of a new generation of vaccines. One of the key steps in future vaccine development is to include markers for diagnostic differentiation of vaccinated animals from those naturally infected with wild-type virus. Using a cDNA infectious clone of Type 1 PRRSV, we have constructed a recombinant green fluorescent protein (GFP) tagged PRRSV containing deletion of an immunogenic epitope, ES4, in the nsp2 region. In this study, we performed *in vivo* characterization of this marker virus in a nursery pig disease model. The results showed that the recombinant virus was attenuated with a lower level of viremia, but induced a higher level of neutralizing antibody response in comparison to that of parental virus. To compliment the marker identification, we developed GFP and ES4 epitope-based ELISAs. Pigs immunized with the recombinant virus lacked antibodies directed against the corresponding deleted epitope, while generating a high level of antibody response to GFP by 14 days post-infection. Our results demonstrated that this recombinant marker virus, in conjunction with the diagnostic tests, enable serological differentiation between marker virus-infected animals from those infected with the wild-type virus. This rationally designed marker virus will provide a basis for further development of PRRSV marker vaccines to assist with the control of PRRSV.

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