

SWINE HEALTH

Title: Rational Design of a New Generation of PRRSV Differential (Marker) Vaccines (Renewal Summer 2006) - **NPB #: 06-177**

Investigator: Fernando A. Osorio

Institution: University of Nebraska-Lincoln

Co-PI:: Asit Pattnaik, Veterinary and Biomedical Sciences Department

Abstract

This project deals with the development of a new generation of PRRSV differential marker vaccines. We are successfully applying the technology of reverse genetics [infectious clone] to dissect the function of many different parts of the genome and genes in the life cycle of PRRSV in a host. The project is based on the notion that the best type of immunogen against PRRSV has proved to be, so far, a (live, replicating) vaccine that presents the antigens to the pig's immune system in a similar way as wild-type PRRSV does. Therefore our ultimate goal is to develop a live, replicating vaccine of safety and efficacy that would be compatible with eradication. The proposal's objectives are addressed to find answers to the following specific questions: **1. What is the molecular basis of attenuation of virulence in PRRSV? 2. Can we molecularly attenuate PRRSV and obtain a replicating vaccine of unprecedented efficacy and safety? 3. Can we engineer this product to be a "marker" vaccine so that we can integrate robust vaccination together with efficient eradication of PRRSV?** A last, fundamental long-term point requiring an answer is the design of this novel vaccine up to standards of satisfactory protective coverage against infection by both homologous or heterologous PRRSV strains. With these goals in mind we are carrying out, as reported here, a systematic molecular characterization of the virulent phenotype of PRRSV so as to identify the genetic markers of virulence in PRRSV and precisely engineer an attenuated vaccine candidate. We are also defining a series of small segments of PRRSV proteins (epitopes) that can be deleted from the vaccine that could then be used as serologic diagnostic markers of infection. Under this research we have recently reported the construction of the first, proof-of-concept, DIVA (differentiating infected from vaccinated animals) live PRRSV strain that could be use as base platform of a novel marker MLV vaccine X PRRSV.

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 This report has not been peer reviewed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, P.O. Box 9114, Des Moines, Iowa USA

800-456-7675, **Fax:** 515-223-2646, **E-Mail:** porkboard@porkboard.org, **Web:** <http://www.porkboard.org/>