RESEARCH ABSTRACT
SWINE HEALTH

pork checkoff

Title: PRRSV Identification by Virochip - **NPB #11-109**

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Scientific Abstract:

Respiratory disease in pigs is the most important health concern for swine producers today and porcine reproductive and respiratory syndrome virus (PRRSV) is the most economically significant disease affecting the pork industry worldwide. Current identification and surveillance practices for PRRSV involves a few selected U.S. veterinary diagnostic laboratories performing quantitative RT-PCR and ORF5 nucleotide sequencing followed by restriction fragment length polymorphism, a process that typically takes two weeks or more. Therefore there is a substantial need for faster surveillance programs coupled with next generation detection methods to rapidly identify and track genomic changes in PRRSV for animal health preparedness for future outbreaks. In this report we describe the construction of a novel microarray platform designed to rapidly and specifically identify and differentiate all known strains of PRRSV, including novel or emerging isolates encoding a high degree of genetic variability compared to known isolates. Because this microarray platform emphasizes multiple key regions encompassing the entire PRRSV genome it has an increased sensitivity and the ability to track genetic variability. Our results indicate that this platform successfully identified and distinguished the genetic variability of four genetically divergent PRRSV isolates in cell culture samples. Additionally, the limit of detection by quantitative RT-PCR for these samples is approximately the 10^{-6} dilution and the limit of detection for our novel PRRSV microarray is approximately 10^{-7} to 10^{-9} dilution. This data demonstrates that the PRRSV microarray (PRRSV Chip) has a 10 to 1000 times improved sensitivity compared to currently deployed quantitative RT-PCR. We have also demonstrated this array platform successfully identified and differentiated PRRSV using antemortem clinical samples (nasal swab and serum) collected from a pig infected with a Chinese highly pathogenic PRRSV isolate and a bacterial cocktail consisting of *Streptococcus suis*, *Haemophilus parasuis*, and *Actinobacillus suis.* This data demonstrates that the PRRSV Chip is a sensitive and specific tool that is able to quickly identify novel or emerging strains of PRRSV in clinical samples containing multiple swine pathogens.