# RESEARCH ABSTRACT

SWINE HEALTH

**Title:** Mechanism of Antibody-Mediated Neutralization of PRRSV**, NPB #14-222**

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**Scientific Abstract**:

Genetic diversity of porcine reproductive and respiratory syndrome virus (PRRSV) challenges efforts to develop effective and broadly acting vaccines. Although genetic variation in PRRSV has been extensively documented, the effects of this variation on virus phenotype are less well understood. In the present study, PRRSV ORF2-6 variants predominant at early times after experimental infection were identified and chimeric viruses containing all or part of predominant ORF2-6 haplotypes were constructed and tested in virus neutralization. In two pigs, genetic variation in ORF2-6 resulted in increased resistance to neutralization by autologous sera. Mapping studies indicated that variation in either ORF2-4 or ORF5-6 could confer increased neutralization resistance, but there was no single amino acid substitution that was predictive of neutralization phenotype. Detailed analyses of the early steps in PRRSV replication in the presence and absence of neutralizing antibody revealed both significant inhibition of virion attachment and, independently, a significant delay in the appearance of newly synthesized viral RNA. These data reveal that limited variation appearing early after PRRSV infection alters important virus phenotypes and contributes to antigenic diversity of PRRSV.