# RESEARCH ABSTRACT

SWINE HEALTH

**Title:** Testing the Potential of PRRSV GP4 to Protect Swine From PRRS – **NPB #10-099**

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**Industry Summary:**

The objective of the study was to experimentally test the potential of viral protein gp4 in protective immunity against PRRS. In order to accomplish this objective, two recombinant vaccines (pHCMVORF4 and Ad5ORF4) that express the viral gp4 were developed. The vaccines were tested to verify that the constructs were functional before application in swine. To test for protection, vaccination and challenge was conducted in groups of PRRS-free swine. Groups of 5 week old piglets were assigned into groups and given an initial priming dose of vaccine followed by a booster as follows: Group 1 were given phCMVORF4 by gene gun and boosted with Ad5ORF4; Group 2 were primed and boosted with Ad5ORF4; Group 3 were primed and boosted by Ad5Blue (vector control); Group 4 remained unvaccinated (negative control). Additionally, smaller groups of piglets were either primed and boosted with AdORF4 mixed with an oil-in-water adjuvant (ADJ1) or primed with Ad5ORF4 formulated with ADJ2 given by intranasal administration and boosted with Ad5ORF in ADJ2 by injection. To asses protection, experimentally vaccinated pigs were challenged with PRRSV by intranasal inoculation. Blood was collected before and after vaccination and after challenge. The animals were then humanely sacrificed, necropsies were performed and tissues collected for further testing. The main criteria used for determine protection was the score of lung lesions and virus tests.

RESULTS: Overall the vaccination of experimental animals under the conditions used here resulted in incomplete or no protection. The microscopic examination and scoring of lung lesions showed that the groups given the vaccine with adjuvants either by injection or intranasally followed by a boost by injection and the unvaccinated control group had relatively more severe lesion scores on average. The groups given pHCMVORF4 and boosted with Ad5ORF4, Ad5ORF4 or Ad5Blue both for priming and boosting had in average lesser lung scores but no differences between each other. The scoring of lung lesions in the group of pigs vaccinated with suggested a mild protection outcome at best. Both experimentally vaccinated animals and control animals became infected upon challenge with PRRSV thus indicating, as expected, a non-sterilizing immunity as a result of vaccination. There was a low at best and variable induction of virus neutralizing antibodies in individual animals.