# RESEARCH ABSTRACT

SWINE HEALTH

**Title:** Characterization of high passages of an interferon-inducing PRRSV strain**, NPB #15-160**

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**Scientific Abstract:** This should be a scientific description limited to one page in length to describe your project and its results.

Porcine reproductive and respiratory syndrome virus (PRRSV) is known to antagonize the production of type I interferons (IFNs). Type I IFNs are critical to the innate immunity against virus infections and play important roles in activation of the adaptive immunity. We recently discovered the atypical strain A2MC2 that is capable of inducing IFN synthesis in cultured cells. The A2MC2 was serially passaged 90 times (A2MC2-P90) for attenuation of its moderate virulence. A2MC2-P90 retains the feature of interferon induction in MARC-145 cells. The objectives of this study were to characterize A2MC2-P90, construct an infectious cDNA clone of this high passage virus, and assess its virulence and immunogenicity in pigs. The A2MC2-P90 replicates faster with a higher virus yield than the wild type A2MC2 virus. Infection of primary pulmonary alveolar macrophages (PAMs) also induces interferons. Sequence analysis showed that the A2MC2-P90 has genomic nucleic acid identity of 99.8% to the wild type but has a deletion of 543 nucleotides in nsp2. The deletion occurred in passage 60. The A2MC2-P90 genome has a total of 35 nucleotide variations from the wild type, leading to 26 amino acid differences. For construction of a cDNA infectious clone of A2MC2-P90, four fragments spanning the full length cDNA of A2MC2-P90 genome were amplified and assembled into a target vector. A DNA-launched version of the infectious clone was generated by adding ribozymes to both ends of the cDNA. Virus rescue was conducted from the infectious clone for the recovered virus, rA2MC2-P90. To test virulence and immunogenicity of A2MC2-P90, three-week-old piglets were inoculated along with the wild type A2MC2 and Ingelvac PRRS® MLV strain. Results showed that A2MC2-P90 is avirulent and elicits immune response. Compared with Ingelvac PRRS® MLV strain, A2MC2-P90 elicits higher virus neutralizing antibodies. The attenuated IFN-inducing A2MC2-P90 should be useful for development of an improved PRRSV vaccine.