RESEARCH ABSTRACT

SWINE HEALTH

Title: Protective efficacy of adenovirus-vectored ASFV multi-antigen cocktail – **NPB #16-007**

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Scientific Abstract:
African Swine Fever Virus (ASFV) is a high-consequence transboundary animal pathogen that places a huge economic burden on affected countries. The pathogen causes a hemorrhagic disease in swine with a case fatality rate close to 100%. Lack of treatment or vaccine for the disease makes it critical that safe and efficacious vaccines be developed to safeguard the swine industry. Previously, we evaluated the immunogenicity of seven adenovirus-vectored novel ASFV antigens, namely A151R, B119L, B602L, EP402RΔPRR, B438L, K205R and A104R by immunizing commercial swine with a cocktail of recombinant adenoviruses formulated in an adjuvant. The cocktail primed strong ASFV antigen-specific IgG responses as well as ASFV-specific IFN-gamma responses that were recalled upon boosting. To evaluate protective efficacy of the antigen cocktail, we replicated the experiment above and subsequently challenged the pigs with 10^4 $TCID_{50}$ of ASFV-Georgia 2007/1 isolate. The cocktail induced very strong ASFV antigen-specific IgG responses against each antigen in all vaccinees as previously observed. These responses underwent rapid recall upon homologous boost four weeks post-priming. However, upon challenge, the pigs in the treatment group had higher mean clinical scores, mean body temperatures, and decreased WBC counts as compared to the controls. Notably, the mean body temperatures of the pigs in the treatment group was significantly ($p<0.05$) higher than the controls on day four post-challenge. In addition, six of the pigs in the treatment group and only three of the control pigs had to be euthanized on day five post-challenge for animal welfare reasons. Overall, the data suggests that the ASFV-antigen specific antibodies induced in the pig's enhanced ASF virus uptake by macrophages following challenge. The outcome also suggests that the IgG responses induced by these antigens are non-protective and that development of protective ASFV subunit vaccine will likely require an immunization strategy that will elicit strong cytotoxic T lymphocyte response while limiting humoral response.