Title: Use of interferon alpha as an immunomodulator and metaphylactic therapeutic during PRRSV outbreaks

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Scientific Abstract:
Type I interferons, such as interferon alpha (IFNα), contribute to innate antiviral immunity by promoting production of antiviral mediators and also play a role in the adaptive immune response. Porcine reproductive and respiratory syndrome (PRRS) is one of the most devastating and costly diseases to the swine industry world-wide and has been shown to induce a meager IFNα response. Previously we administered porcine IFNα using a replication-defective adenovirus vector (AD5-IFNα) and challenged with a moderately virulent PRRSV. There was a better clinical outcome in pigs treated with IFNα, including lower febrile responses and decreased percentage of lung involvement. Viremia was delayed and there was a decrease in viral load in the sera of pigs treated with IFNα. In addition, there was an increase in the number of virus-specific IFNγ secreting cells, as well as an altered cytokine profile in the lung 14 days post-infection, indicating that the presence of IFNα at the time of infection can alter innate and adaptive immune responses to PRRSV. In this experiment we further explored the use of IFNα as an adjuvant given with attenuated PRRSV virus vaccine to determine if it would result in an enhanced immune response to the vaccine. One injection of the Ad5-IFNα given with the vaccine was able to totally abolish replication of the vaccine virus resulting in no detectible immune response. Although the IFNα did not end up having the desired adjuvant effect, the results are promising for the use of IFNα as a treatment for PRRSV infection. An additional study will examine its use as a metaphylactic treatment for an outbreak of PRRSV to both treat and prevent spread of the virus.