RESEARCH ABSTRACT

SWINE HEALTH

Title: Long lasting vaccine-induced immunity for swine flu (H3N2).
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Abstract: Swine influenza virus (SIV) strain H3N2 emerged in North America in 1998 causing severe respiratory disease in pigs. In this study 2 recombinant adenoviruses were developed as potential vaccines against these H3N2 influenza strains. To construct the recombinants, the SIV hemagglutinin (H3) gene and the nucleocapsid protein (NP) gene were subcloned into a shuttle vector and by homologous recombination were inserted into the E1 region of replication-defective human adenovirus-5 vector vaccine. This vector virus has been shown to infect pigs but the course of the infection is limited to only one round of viral replication. Each recombinant virus expressed its respective protein as determined by immunoblotting, by immunoprecipiation, and by immunocytochemical staining. All 3 immunological procedure were carried out with specific monoclonal antibodies.

Three groups of pigs (10 pigs/group) were vaccinated intramuscularly with the recombinants; one group was vaccinated with the recombinant adenovirus expressing the H3 protein, one group was vaccinated with the recombinant adenovirus expressing the NP protein, and one group was vaccinated with both recombinants in a mix. Two additional control groups were included in the animal trial. One control group was challenged with a virulent H3N2 field strain and one control group remained unchallenged. The results showed that pigs in the groups given the recombinant adenovirus expressing the H3 protein developed high levels of hemagglutination inhibition (HI) antibody by 4 weeks post vaccination. Pigs in the group vaccinated with both recombinant viruses in a mixture were completely protected. Complete protection was shown by the lack nasal shedding of virus following challenge and by the lack of lung lesions at one week following the challenge infection.