

SWINE HEALTH

Title: PCV2 replication and disease enhancement through lymphocyte stimulation – NPB #06-095

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Scientific Abstract:

Porcine circovirus type 2 (PCV2) has been shown to induce a number of diseases including postweaning multisystemic wasting syndrome (PMWS). Many PCV2 infected pigs remain asymptomatic, while other pigs in the same herd and farm develop severe disease. The mechanism by which disease is triggered from infection is currently unknown. Based on earlier work that found proliferating lymphocytes had increased virus replication *in vitro*, we hypothesized that pigs with activated lymphocytes would result in an increase in the number of animals that developed clinical disease. A model using co-infection with *Mycoplasma hyopneumoniae* (MHYO) and PCV2, which had previously been shown to have an increased incidence of PCV2 disease, was used to evaluate the effect of dual infection on lymphocytes from infected pigs and their ability to respond to mitogens and MHYO antigens. Macroscopic and microscopic lesions, PCV2 viremia and antibody response, real-time PCR for MHYO and PCV2 DNA and a real-time RT-PCR that measures the PCV2 Cap as a measure of replication were assessed. No pigs demonstrated clinical disease throughout the trial. The pigs developed significant pneumonia consistent with MHYO infection, were viremic and developed serum antibodies to PCV2 indicating successful inoculations. However, microscopic evidence of PCV2 induced disease based on lymphoid depletion and clinical disease was lacking. Lymphocytes from peripheral blood, bronchial and inguinal lymph nodes and lungs were isolated, cultured with either mitogens or MHYO antigen and stained followed by assaying by flow cytometer for proliferation and apoptosis. Even though the pigs were infected with PCV2, in the absence of apparent disease, no alteration in lymphocyte populations, ability to be stimulated and proliferate or increased apoptosis was observed, demonstrating that the presence of PCV2 alone does not result in alteration or suppression of lymphocytes. More research is required to determine the mechanism by which PCV2 infection results in disease in pigs.

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