RESEARCH ABSTRACT

SWINE HEALTH

Title: Antigen-specific T cell responses associated with PCVAD pathogenesis - **NPB # 10-012**

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Abstract: The hypothesis for this project was that the T cell epitope response pattern of pigs infected with PCV2, or dual-infected with PCV2 and PRRSv, will differ from that of vaccinated pigs, with the differences associated with disease severity. Pigs were infected using a PCV2-PRRSv dual-infection model to induce PCVAD, and lymphoid cells, isolated from lymph nodes taken from those pigs at necropsy, were used to map T cell epitopes recognized by the pigs. The T cell epitope expression pattern was compared with the patterns from T lymphocytes from pigs infected with PCV2 alone, and from pigs vaccinated with a commercially available PCV2 vaccine. Untreated control pigs were included to confirm specificity of the responses. Supporting data included anti-PCV2 antibody titers during the infection period, CP B cell epitopes recognized by sera during infection, lymph node weights, lymph node histopathology and PCV2 antigen immunohistochemistry, and immunophenotyping of lymph node lymphoid cell populations. The results indicate that PCV2-infected and dual-infected pigs have T lymphocyte epitope recognition patterns that differ from vaccinated pigs and from each other, with dual-infected pig T cell epitopes clustering at the carboxy-terminus of the protein and PCV-2 infected pig T cell epitopes more prominent at the amino-terminus of the protein. There are no significant differences between the number of lymphoid cells per gram of lymph node tissue among any of the treatment groups. However, T lymphocytes tend to predominate over B cells and macrophages in control pig nodes and have low CD25 expression, compared with vaccinated pigs that have a larger proportion of B lymphocytes and/or follicular dendritic cells and substantial CD25 expression, and PCV2 single- and dual-infected pigs that have roughly equal proportions of T cells and B cells/follicular dendritic cells and somewhat less CD25 expression. Histopathology shows that dual-infected pigs have epithelioid clusters of macrophages in lymph node germinal centers and collections of macrophages positive for cytoplasmic PCV2 antigen, compared with the other treatments. Anti-PCV2 titers show that PCV2- and dual-infected pig titers rise late in the infection process and remain high while vaccinated pig titers rise early after vaccination and remain elevated. Control pigs do not have high titers of anti-PCV2 antibodies. B cell epitope data largely agree with previous studies.

There was one pig in the dual-infected group that differed substantially from other dual-infected pigs. This pig had anti-PCV2 titers that were relatively low early in infection and became negative by 40 days post infection. The T cell epitope expression pattern from this pig resembled the vaccinated pig pattern in that epitopes at both ends of the CP protein were recognized; however, the number of epitopes recognized was limited compared with the vaccinated pigs. Histologically, lymph nodes from this atypical dual-infected pig did not have epithelioid macrophages and contained rare cells expressing PCV2 antigen in the nucleus, rather than the cytoplasm.