Cell-mediated and humoral immune responses in pigs following primary and challenge-exposure to Lawsonia intracellularis - DTU Orbit (16/03/2019)

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To investigate immune responses upon re-infection with Lawsonia intracellularis, local and peripheral humoral and cell-mediated immune responses to primary and challenge inoculations were studied in 22 pigs. Pigs were orally inoculated with virulent L. intracellularis at the age of 5-6 weeks, treated with antibiotics and challenged with a re-inoculation (RE) at the age of 12 weeks. Treatment control (TC) pigs received only the primary inoculation and challenge control (CC) pigs received only the secondary inoculation at 12 weeks of age. Following this regimen, all RE pigs were protected against the re-infection as defined by reduced colonisation and pathology of intestinal mucosa, absence of bacterial shedding and without increase in serum acute phase protein response. In the protected RE pigs, serum IgG responses were variable with both high and low responders. Serum IgA responses were not boosted by the re-inoculation, since identical intestinal IgA responses developed in response to the inoculation in both the susceptible CC pigs and the protected RE pigs. A memory recall cell-mediated immune response developed in RE pigs which was significantly stronger compared to the primary response in age-matched CC pigs as assessed by whole blood IFN-γ assay and by calculation of IFN-γ integrated median fluorescence intensity (iMFI) after flow cytometry. The major IFN-γ producing cells were identified as CD8+ and CD4+CD8+ double positive lymphocytes. The results indicate that cell-mediated immune responses are likely mediators of protective immunity against L. intracellularis, with CD8+ effector cells and CD4+CD8+ double positive memory T cells as main contributors to the antigen-specific IFN-γ production.

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