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Characterisation of cellular immune response of pigs experimentally infected with the novel influenza A/H1N1 virus

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During April 2009, a novel human pathogenic influenza A virus was detected. The virus belongs to the influenza H1N1 subtype but contains an uncommon combination of gene segments. Experimentally infected pigs showed mild clinical symptoms but developed unexpected low titers of virus neutralizing antibodies. This is probably the reason why those pigs could be successfully re-infected, again with detectable clinical symptoms and virus shedding. Even after re-infection with homologous virus only small amounts of virus-specific neutralizing antibodies could be determined.

In vitro restimulation experiments using activated lymphocytes obtained from pigs infected with the novel influenza virus resulted not in the expected proliferation of CD8-/CD4+ T cells (known from swine original influenza virus infections in pigs), but in a massive proliferation of CD4+/CD8+ T lymphocytes. This finding corresponds to proliferation of cytotoxic T cells after homologous novel influenza re-infection in vivo.

Using an anti CD21 antibody a complete depletion of B cells could be detected within 5 days after antigen re-stimulation in vitro. In addition, in culture supernatants of these in vitro stimulated lymphocytes high amounts of virus specific antibodies were measured in HI assay.