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Expression of immunogenic proteins of zoonotic H1N1 influenza A virus in a pseudorabies virus vector

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The porcine alphaherpesvirus pseudorabies virus (PrV) is the causative agent of Aujeszky's disease which induces abortions in sows, high mortality rates in piglets, as well as fatalities in many other mammalian species, excluding higher primates and humans. Stably attenuated PrV live virus vaccines have been developed for control of the disease, which are also suitable as vectors for the expression of immunogenic proteins of other swine pathogens. Although pigs are barely harmed by influenza A viruses, they represent important reservoir hosts, and function as mixing vessels in which novel zoonotic viruses may arise. For the development of vectored influenza vaccines for pigs, and to investigate specific immune responses *in vivo*, the major structural proteins (hemagglutinin, neuraminidase, nucleoprotein, matrix proteins) of the recent pandemic swine origin H1N1 influenza A virus were expressed under control of human or murine cytomegalovirus immediate-early promoters after insertion into the genome of the PrV vaccine strain Bartha, which has been cloned as an infectious bacterial artificial chromosome (BAC). To enhance transgene expression, synthetic introns in the 5'-nontranslated part of the transcription units, and synthetic codon-optimized influenza virus genes were introduced. *In vitro* replication properties of the obtained PrV recombinants, as well as expression levels and localization of the heterologous proteins in infected cells and in virions were analyzed, and the immune response of pigs to hemagglutinin-expressing PrV is currently investigated. For immunological *in vitro* studies, the tested influenza virus antigens were also expressed in recombinant baculoviruses.

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