I10

Bat influenza virus chimeras as basis for the development of a new type of vaccine backbone for livestock vaccination

J. Schön[1], M. Gorka[1], D. Hoffmann[1], W. Ran[2], M. Juozapaitis[2], M. Schwemmle[2], M. Beer[1]

[1]Institute of Diagnostic Virology, Friedrich-Loeffler-Institut, Greifswald - Insel Riems, Germany; [2]Institute for Virology, University Medical Center Freiburg, Germany

Keywords: bat influenza, vaccination, modified live vaccine

Background and objectives: Effective and safe influenza A viruses (IAV) live vaccines for animals do not exist with very few exceptions. This is mainly due to the risk of reassortment events between vaccine and wildtype strains, and partly because of the pathogenicity associated with live vaccine strains especially in very young animals. However, we recently succeeded to generate chimeric viruses containing the bat influenza A-like H17N10 backbone, and the glycoproteins hemagglutinin and neuraminidase from prototypic IAVs. These chimeric viruses do not reassort with ordinary IAVs.
Materials and methods: We passaged the chimeric viruses in eggs and day old chicks to adapt the viruses to the avian system. Chimeric vaccine viruses were subsequently tested for safety in chicken and in addition challenge experiments with HPAIVs were performed.
Results: By passaging the LP chimeric viruses in eggs and chicken the replicative potential was clearly improved as demonstrated by a reduced mean death time in eggs. These vaccine prototypes induced no clinical signs in neither adult nor day old chicks. Protection levels in adult chicken against a HP H5N1 or a HP H7N1 challenge achieved an efficiency of around 70%.
Conclusion: Bat influenza based modified live vaccines are able to induce protective immune responses in chicken. However, further adaptation to the avian system will likely improve the replicative potential and the corresponding immunological responses.