

VGT 1

Development of Newcastle Disease Virus Vector Vaccines against Highly Pathogenic Avian Influenza

*Angela Römer-Oberdörfer (1), Jutta Veits (1), Dorothee Helferich (1), Thomas C. Mettenleiter (1)

(1) Institute of Molecular Biology, Friedrich-Loeffler-Institute, Greifswald-Insel Riems, Germany

Avian influenza virus (AIV) of H5 or H7 hemagglutinin subtype and highly pathogenic Newcastle disease virus (NDV) are important pathogens in poultry worldwide. While low pathogenic live vaccines against Newcastle disease are easily administered by mass vaccination via spray or drinking water, available vaccines against avian influenza have to be administered individually. Furthermore, they do not allow the differentiation between infected and vaccinated animals (DIVA).

Since the advent of reverse genetics for NDV targeted manipulation of its negative stranded RNA genome has become possible and expression of foreign genes from recombinant NDV vectors has been successful.

In this study, the open reading frames encoding hemagglutinin H5 of highly pathogenic AIV (HPAIV) subtypes H5N1 or H5N2 were inserted into the NDV genome between the NDV fusion and hemagglutinin-neuraminidase surface glycoprotein genes. Recombinant viruses were rescued using established techniques. Generated recombinants expressed the foreign hemagglutinin stably but transgene expression did not alter the virulence of NDV as verified by determination of intracerebral pathogenicity indices. While chickens immunized with NDVH5 (H5N2) and challenged with HPAIV H5N1 showed clinical signs, NDVH5 (H5N1) immunized chickens were not affected by infection with homologous HPAIV H5N1. Therefore, a close match between the influenza hemagglutinin in vaccine and field virus is desirable for full protection against HPAIV.

Recombinant NDV-AIV which can be easily adapted to the current situation and administered by mass application shows excellent promise for the simultaneous control of two devastating poultry diseases.

Corresponding author:

Römer-Oberdörfer, Angela

angela.roemer-oberdoerfer@fli.bund.de

Phone: ++49 383517107

Fax: ++49 38351 7275