



Foredrag

Development of Recombinant Vaccines Against IBDV in Chickens and IPNV in Fish

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Abstract

Since commercial production of poultry and seafood employs high-density rearing methods, it tends to expose large numbers of these species to infectious diseases. One of the most harmful to chickens is Gumboro disease -- a condition caused by infectious bursal disease virus (IBDV), which suppresses the immune system in young chickens and causes losses of more than 150 million dollars each year. A similar type of virus, infectious pancreatic necrosis virus (IPNV), causes infectious pancreatic necrosis disease in salmonids. An outbreak of IPNV infection can destroy an entire aquaculture operation. Economic losses of 60 million dollars per year from the virus have been reported in Norway. To develop safe, economical, and effective subunit vaccines for IBDV and IPNV, we cloned the viral capsid protein genes and produced the capsid proteins using a baculovirus expression system. Expression of these genes in insect cells resulted in the synthesis of viral capsid proteins that self-assembled to form "virus-like" particles of IBDV or IPNV. In chickens, a single dose of this recombinant, subunit IBDV vaccine conferred complete active and passive protection against challenge with various IBDV strains. Similarly, Atlantic salmon that received a single dose of the injectable, recombinant IPNV vaccine evoked a protective response against IPNV challenge and exhibited significantly lower cumulative mortality rate (35%) than the control fish (77%). In addition, rainbow trout fry vaccinated by immersion also showed a lower cumulative mortality rate (8%) than the control fish (14%). Having developed the reverse genetics system for these viruses, where one can generate an infectious virus in host cells with synthetic RNAs derived from cloned cDNA, we are identifying the viral protein(s) that are involved in pathogenesis and virulence of IBDV and IPNV. Using this innovative technique, we have prepared a live, attenuated, multivalent recombinant IBDV vaccine that gives complete protection against challenge with different IBDV strains.

Vel mødt!

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