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Project Title: Establishment of Animal Models Used for Vaccine Development
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Executing Institute: Animal Health Research Institute, Council of Agriculture
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Abstract:

In 2008, we have performed several important animal models for the development of avian influenza H5N1 vaccines, including: (1) the virus challenge model of avian influenza in mice; (2) to establish rabbit animal model for vaccine study; (3) to establish the ferret model for determining the vaccine efficacy following virus challenge; (4) to produce the monoclonal antibodies against H5N1 virus. We have finished the test of viral LD_{50} of two virus isolates in mouse models, indicating that A/Duck/China/E319-2/2003 and A/VN/2004 viruses contained various levels of virulence in mice. The A/VN/2004 virus is a highly virulent strain in mice. The LD_{50} was tested to be 10^{-4} dilution. However, the A/Dk/CHN/E319-2/2003 virus was a low virulent strain for mice with LD_{50} equal to $10^{7.7}$ EID_{50}. The mouse model has been used to help three units, including CDC, NHRI and Academia Sinica, determining vaccine efficacy. On the establishment of ferret model, due to the limitation of ferrets imported from USA requiring the quarantine procedure, we have using 4 pet ferrets to practice the handling techniques and to characterize viral characteristics following infection. The experimental level of ferrets will be transported to this institute at Novenber 14th. For the production of monoclonal antibodies against H5N1 virus, we have obtained 16 strains of hybridoma, which secret antibodies against the HA, NA, NP and NS1 proteins. The antibodies such as YY1, Y5 and 33A contained activity to neutralize H5N1 virus; and the YY1 and 33A contained activity to inhibit hemaglutinin for chicken RBC. The identification of monoclonal antibodies recognizing viral components were determined by using proteins expressed in baculovirus system.

Key words : Avian influenza; Highly pathogenic avian influenza; Subunit vaccine; Animal model; Monoclonal antibodies