

## Research project IZS VE 06/10

**Evaluation of molecular determinants involved in transmission of highly pathogenic avian influenza viruses in mice and the potential role of this species in the epidemiology of avian influenza**

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Although the efficacy of transmission is a key factor in determining the severity of influenza epidemics, viral properties that affect the transmissibility of influenza viruses among mammalian species, including humans, remain poorly understood.

Data generated at the IZSve demonstrated for the first time that H7N1 and H5N1 highly pathogenic avian influenza (HPAI) viruses can transmit from infected mice to contact sentinels, although exhibiting different pattern of infection and transmission, indicating that this species could be used to investigate viral factors influencing transmissibility of avian influenza viruses in non-avian species. Recent studies have also demonstrated that some influenza viruses of several different hemagglutinins types collected in wild birds, replicate in the mouse model without adaptation and suggest that mice might play a role in the epidemiology of this infection.

The aim of this project is first to investigate molecular determinants of transmissibility of selected avian influenza viruses (AIV) in mice by generating recombinant viruses through reverse genetics and evaluating their transmissibility *in vivo*.

Second, to explore the potential role of synanthropic mammalian species in the epidemiology of avian influenza infection of poultry and in the adaptation and subsequent transmission of avian influenza viruses to humans, we will further investigate transmission potential of HPAI viruses in rodent species which might naturally be present in the environment during avian influenza outbreaks in poultry.