

Modulation of clade 2.3.4.4B HPAIV H5N8 infection in naturally pre-exposed mallards

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The 2016/2017 H5N8 avian influenza (highly pathogenic AIV) epidemic was the most severe ever reported in Germany.

To determine the role of wild birds in HPAIV dynamics, a seven AIV-seropositive mallards were infected with the 2016 clade 2.3.4.4B H5N8 virus. Susceptibility of the mallards towards HPAIV after AIV pre-exposure, viral shedding, and transmission to seronegative contact ducklings were investigated.

Upon heterologous AIV infection with H5N8, virus shedding by the mallards was sufficient to infect all contact ducklings, but clinical symptoms were not prominent in the mallards. Three of four contact ducklings died within four days, though one survived, despite infection and virus shedding.

The mallards revealed a higher oropharyngeal virus shedding than cloacal shedding and surviving ducks developed H5 specific antibodies within 14 days. Infectious virus could be isolated from several water samples.

After the homologous rechallenge of surviving ducks 21 days post heterologous infection, neither clinical disease nor virus shedding was observed for directly inoculated mallards nor cohoused contact ducklings.

We postulate that pre-exposed mallards might become a key-player and Trojan horse in clade 2.3.4.4B HPAIV H5N8 dynamics, as our infection-model showed that mallards were clinically protected, but still shed virus efficiently.

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