

Plenary Lecture 4

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Schmallenberg virus – a novel orthobunyavirus emerging in Europe

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In 2011, signs of an infectious disease in cattle were reported which was associated with milk drop and fever in Germany and primarily with diarrhea in the Netherlands. A pool of blood samples from diseased dairy cows from a farm near the city of Schmallenberg was analyzed by metagenomics using next generation sequencing technology. Sequence fragments with a high homology to viruses of the genus *Orthobunyavirus* were detected, and the novel virus was designated as 'Schmallenberg Virus' (SBV), the first member of the Simbu serogroup in Europe. Obviously, the introduction occurred in a region which also experienced the first bluetongue virus serotype 8 cases in Central Europe in 2006, and the virus spread within 1.5 years over a wide geographical area. Subsequently, SBV-infection of pregnant sheep and cows resulted in the birth of characteristically malformed lambs and calves. Phylogeny and cross neutralisation demonstrated the closest relationship of SBV with viruses of the Sathuperi species like the Australian Douglas virus. PCR tests with pooled midges caught in fall 2011 were able to detect SBV-RNA in biting midges such as *Culicoides obsoletus* indicating vector-transmission similar to other Simbu serogroup viruses. First animal experiments with cattle and sheep resulted in a uniform but short viremic period of about 3 to 5 days. However, viral RNA could be detected in some animals more than 28 days post inoculation in the mesenteric lymphnodes. A zoonotic potential of SBV could be excluded by serological studies performed on humans exposed to SBV.

Possible ways of introduction, epidemiological data, genetic variability as well as results of the first pathogenesis studies will be presented, and the potential of metagenomics for pathogen discovery will be discussed.