Zoonoses

0506

Dobrava-Belgrade hantavirus isolate from Germany shows high pathogenic potential according to its receptor usage and innate immunity induction.

E. Popugaeva[1], P.T. Witkowski[1], M. Schlegel[2], R.G. Ulrich[2], J. Ettinger[1], J. Hofmann[1], A. Rang[1], D.H. Krüger[1], *B. Klempa[3,1]

[1]Charité Medical School, Institute of Virology, Helmut-Ruska-Haus, Berlin, Germany
[2]Friedrich-Loeffler-Institut, Institute for Novel and Emerging Infectious Diseases, Greifswald-Insel Riems, Germany
[3]Slovak Academy of Sciences, Institute of Virology, Bratislava, Slovakia, Germany

Dobrava-Belgrade virus (DOBV) is an European hantavirus causing haemorrhagic fever with renal syndrome (HFRS) with fatality rates of up to 12 %. DOBV-associated clinical cases typically occur also in the northern part of Germany where the virus is usually carried by the striped field mouse (*Apodemus agrarius*). However, the causative agent responsible for human illness has not been isolated yet.
Here we report on characterization of a novel DOBV cell culture isolate from Germany obtained from a lung tissue of "spillover" infected yellow necked mouse (*A. flavicollis*) trapped near Greifswald. Phylogenetic analyses demonstrated close clustering of the virus with the nucleotide sequences obtained from German HFRS patients providing a direct link between the new strain, designated Greifswald (GRW/Aa), and HFRS cases in northern Germany. The virus was effectively blocked by specific antibodies directed against ß3 integrins and Decay Accelerating Factor (DAF) indicating their usage as entry receptors. In addition, activation of selected innate immunity markers as interferon β and λ as well as antiviral protein MxA after viral infection of A549 cells was investigated and showed that the virus modulates the first-line antiviral response in a similar way as the highly pathogenic Hantaan virus.
In summary, our study reveals novel data on DOBV receptor usage and innate immunity induction in relationship with virus pathogenicity and underlines the potency of German DOBV strains to act as a human pathogen.

Corresponding author:
Boris Klempa
boris.klempa@charite.de