

First isolation and genetic characterization of two tick-borne encephalitis viruses in Germany since 30 years

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Tick-borne encephalitis virus (TBEV) induces the most important form of viral meningitis and encephalitis in humans in Europe and Asia. In Germany about up to 550 human cases of TBE are reported annually with their majority occurring in Bavaria and Baden-Wuerttemberg. Well known endemic areas include the Lake Constance area, the Rhine Valley and its side valleys, the Main-Spessart region in Lower Franconia and the Danube region around Passau. Despite the presence of TBE cases and the ongoing areal spread of human TBE infections in Germany, the last TBEV strain was isolated in Germany 30 years ago. Here we report the isolation and genetic characterization of two TBEV strains. Firstly, a virus (strain Amberg) was isolated from ticks originating from a region of the central Upper Palatine. In this area seven severe cases of TBE, three of them fatal, were registered between 2003 and 2005. Secondly, a TBEV (strain Salem) was isolated from macaque brain (*Macaca sylvanus*) after natural exposure (tick bite) in a risk area at Lake Constance. The genetic characterisation showed that both isolates belong to the Central European subtype of TBE virus however exhibit remarkable amino acid exchanges in some regions e.g. the envelope protein. Embedded in the BMBF-network "Emerging arthropod-borne-viral infections in Germany: Pathogenesis, diagnostics and surveillance" further studies will be performed to investigate biological and pathogenic properties of these two new isolates.

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