

# Isolation of the Tick-Borne Encephalitis Virus from Mosquito in Khabarovsk Region of the Far East of Russia

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Rec date: Jul 18, 2015; Acc date: Aug 19, 2015; Pub date: Aug 22, 2015

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## Editorial

**Background:** Flaviviruses are subdivided into three groups—mosquito-borne, tick-borne and no-known vector viruses. Tick-borne encephalitis virus (TBEV) is the most widely spread in Eurasia which is transmitted to man by tick bites and causes severe neuroinfection with lethal outcomes. Ticks are main carriers and reservoir hosts of the TBEV. The fusion peptide of the TBEV remains a functional structure during intracellular digestion of blood, their long life cycle up to 3-6 years at each stage of development and transovarial transmission of the TBEV was not found. Natural TBEV infection had been revealed for 16 species of ixodid ticks and 3 untranslated regions as well as cyclisation sequences were typical for the TBEV (92-97% homology within the Far Eastern subtype of the TBEV).

**Methods:** TBEV strains were isolated from a pool of mosquito *Aedes vexans* and ticks *Ixodes persulcatus* Schulze in new-born mice and porcine embryo kidney cells. Nucleotide sequences of reverse transcription-PCR products were determined using DNA analyzer ABI 3700 (Applied Biosystems, USA). Assembling of the nucleotide sequences into complete genomes of the TBEV strains, their alignment and phylogenetic analysis were performed using MEGA 6.06.

**Conclusions:** TBEV with fusion peptide and untranslated regulatory regions for the Far Eastern subtype can be isolated from mosquito *Aedes vexans*. Two TBEV strains isolated from mosquitoes in 1978 (Vashnev) and 2014 (L230 MI 9) have 92% homology of their complete genomes similar to homology between Far Eastern strains isolated from ticks.

**Results:** Phylogenetic analyses showed its close relationship with the TBEV strains of Far Eastern subtype isolated in the same Khabarovsk region of Russia both from ticks (strain 1230 (KF880805) and Khekhtzir 9-13 10-13 17-13 (KT001070- KT001072) and mosquito (Malishevo (KJ744034) isolated from *Aedes vexans nipponii* in 1978).