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Asymptomatic Langat virus infection-related impact on anxiety-dependent behavior and hippocampal neuron morphology and function.

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Tick-borne encephalitis virus is an important human pathogen and can cause the Tick-borne encephalitis (TBE), which is a serious illness. Patients with clinical symptoms can undergo severe meningo-encephalitis with sequelae including cognitive disorders and paralysis. Though, less than 30% of patients with clinical symptoms develop meningo-encephalitis. The number of seropositive humans in some regions indicates a much higher number of TBEV infections, either with no or subclinical symptoms. The functional relevance of these subclinical TBEV infections and their influence on brain functions, such as learning and memory, has not been investigated so far.
In the present study, we analyzed the phenotypic effect of a subclinical infection of Langat virus, a live-attenuated member of TBEV, on spatial memory and morphological changes in the hippocampus of mice. Viral replication in the olfactory bulb is associated with dendritic spine loss and activation of microglia and astrocytes in the hippocampus. Our data provide evidence that already subclinical infection affects hippocampus-dependent learning.