

Morphofunctional Changes in the Brain Tissue of 5xFAD Transgenic Mice

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In the present study, we performed a comparative analysis of structural and ultrastructural changes in the nervous tissue of the olfactory bulbs, hippocampus, and entorhinal cortex in 5xFAD transgenic mice that model the pathogenesis of Alzheimer's disease, and also investigated the distribution of the main amyloid-degrading neuropeptidase neprilysin (NEP) relative to wild-type mice. The study of the structure of the nervous tissue showed, that in transgenic animals characterized by increased production of amyloid peptide A β , there is an increasing death of brain neurons, as a result of which the neural network is disrupted. In addition, electron microscopy study revealed in 5xFAD mice a decrease of the density of synaptic contacts and dendritic spines, local foci of the nervous tissue damage, the appearance of autophagolysosomes in the neuropil of the tissue. Some features of the neurodegenerative processes were shown compared to wild-type mice. In 5xFAD mice, there were a change in the distribution of amyloid-degrading peptidase NEP in the entorhinal cortex and in the hippocampus, as well as a decrease in the intensity of its staining in the entorhinal cortex. In transgenic mice at the age of 6 months, some memory impairment was observed when analyzed in a novel object recognition test relative to wild-type mice.

Keywords: 5xFAD transgenic mice, olfactory bulbs, hippocampus, entorhinal cortex, ultrastructure, neurodegeneration, amyloid peptide, neprilysin, novel object recognition test