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Influence of the constitutive, conditional and inducible astroglia-derived tenascin-C ablation on synaptic function

Speaker:

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Project description:

Extracellular matrix molecules derived from glial cells have been shown to be important mediators of neuron-glia interactions during development. They have recently also been shown to be crucial ingredients in regeneration of the injured nervous system and in synaptic plasticity of adult mammals. One of these extracellular matrix molecules is tenascin-C that is prominently expressed by astrocytes at early stages of brain development and, in some brain regions, also in the adult. The aim of our study is to investigate how tenascin-C may affect synaptic plasticity in the hippocampus of young adult mice. These studies will be conducted with constitutively, conditionally (under the control of the human GFAP promoter) and tamofixen inducibly-ablated mice. The dynamic features of astroglial process and dendritic spine morphology will be studied in these mutants by 2-photon microscopy using transgenic mice expressing green fluorescent protein under the control of the human GFAP promoter and Dil labeling of spines. Conventional immunocytochemistry will be carried out to monitor neurons and subpopulations of neurons and their relative proportions and localization with respect to astrocytes. Electron microscopy will be used to stereologically monitor the fine structure of synapses and associated astrocytic processes. These finings and extensive electrophysiological measurements will be related to CA1 and CA3 hippocampus-associated behavioral parameters, such as trace fear conditioning, pattern completion, working memory and step-down avoidance, representing higher levels of astrocyte-synapse interactions.

Quelle:
https://gepris.dfg.de/gepris/projekt/5430089?language=en