

Cellular mechanisms of healthy brain ageing under caloric restriction

Initiative: Trilaterale Partnerschaften – Kooperationsvorhaben zwischen Wissenschaftler(inne)n aus der Ukraine, Russland und Deutschland

Bewilligung: 14.02.2016

Laufzeit: 3 Jahre

Using biochemical, electrophysiological and in vivo/in situ imaging approaches the following specific aims will be addressed: 1) Characterization of the biochemical (energetic balance, efficiency of glycolysis and mitochondrial function, oxidative stress intensity) and physiological (at the single cell and network level) status of the ageing brain. 2) Comparison of the extent of ageing-induced deregulation of brain function in control and CR animals. 3) Deciphering cellular/molecular mechanisms underlying beneficial effects of CR, identification of pathways that can be targeted by CR-mimetics for future therapies. This project is expected to produce fundamental knowledge on the effects of ageing on neurons, astrocytes and microglia both in vitro and in vivo and on the mechanisms underlying caloric restriction-based improvement of their function. Based on the data obtained one shall be able to identify critical cellular/molecular pathways that can be targeted by CR-mimetics for future therapies.

Projektbeteiligte

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Healthy brain aging: interplay between reactive species, inflammation and energy supply

Intracellular Ca²⁺ stores control in vivo neuronal hyperactivity in a mouse model of Alzheimer s disease

A bell-shaped dependence between amyloidosis and GABA accumulation in astrocytes in a mouse model of Alzheimer s disease

Age-related changes in microglial physiology: the role for healthy brain ageing and neurodegenerative disorders

A new approach for ratiometric in vivo calcium imaging of microglia