

The research Laboratory of the Hans-Berger Department of Neurology is looking for:

Doctoral student (w/m) (life science, biology)

For an experimental doctoral thesis:

Impact of altered microglial immune response on use-dependent brain plasticity in aging

Project:

Previous work of our group showed an increased level of inflammatory cytokines in the aging brain, which contributes to the age-related cognitive decline. Microglia, the resident immune cells in the brain contribute to this inflammatory microenvironment, however, the exact role of microglia in normal and pathological brain aging is still unclear. In a recent study we found that microglia from the murine brain develop pathogen-dose and age-dependent trained immunity and tolerance after repeated stimulation.

The aim of this project is to evaluate the impact of dose-dependent activation of microglia by LPS and β -glucan on brain plasticity. Effects of dose- and state-dependent microglia activation on neuron survival, synapse formation and pruning will be investigated *in vitro* using a cell-co-culture we recently developed. *In vivo*, effects of microglia activation will be assessed using young and aged mice after previous sensitization or after induction of tolerance, and after pharmacological and genetic depletion and replacement of microglia. Changes in brain plasticity will be determined using molecular, electrophysiological and behavioral analyses.

Your profile:

- Student of molecular medicine, biology or biochemistry
- Great interest in experimental research
- Theoretical and practical experience in molecular biology (DNA / RNA analysis) as well as experience in cell culture are desirable
- Independence and initiative at work
- The position will be funded by the IZKF

About us:

The focus of research of our laboratory at the Department of Neurology is to elucidate mechanisms determining brain aging under healthy and pathological conditions and their impact on brain plasticity and cognition.

Our research group applies state of the art methods and techniques including molecular, immunohisto- and cytochemical, electrophysiological approaches and advanced analyses based on high resolution microscopy and magnetic resonance imaging.

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