Heidelberg University
Institute of Physiology and Pathophysiology

UNIVERSITÄT HEIDELBERG
ZUKUNFT SEIT 1386

The Medical Biophysics Lab (Head: Prof. Dr. Alexander Groh) at the Institute of Physiology and Pathophysiology, Heidelberg University offers a DFG-funded

PhD Position in Cellular and Systems Neuroscience.

Description: The project aims at understanding the role of cortico-thalamo-cortical communication in the somatosensory system. Our preliminary work suggests that functional ensembles in the higher-order thalamus, the posterior medial nucleus (POm) in the rodent whisker system, are likely generated by motor, sensory and context-dependent variables (whisking, locomotion, salience). Although we do not know the exact relationship between POm ensembles and distinct behaviours, these complex thalamic representations largely reflect cortical computations, which are conveyed via corticothalamic (CT) pathways to higher-order thalamic networks. Our overarching goal is to understand the function of these "higher-order ensembles" in behavior – they could be involved in detecting salient stimuli and preparing an appropriate motor response, or might play a role for selective attention, or in modulating sensory-motor integration. Multi-site electrophysiological recordings allow us to monitor neuronal ensembles in the thalamocortical system in the context of behaviour. Optogenetics will be used to probe circuit mechanisms of cortico-thalamo-cortical communication. These techniques will be applied in a behavioural learning paradigm to identify the hitherto unknown physiological roles of CT pathways.

The research is carried out in collaboration with Prof. Thomas Kuner (Institute for Anatomy and Cell Biology), involving a vibrant environment and a wide array of techniques and expertise.

The position is funded according to the public salary scheme TV-L (E13, 65%), is available at the closest possible date and is limited to a three-year period. Heidelberg University and University Hospital provide attractive support for young families.

Key words: Behaviour, in vivo electrophysiology, optogenetics, mathematical/computational modelling, cognition, learning

Applicant's profile: Master's degree in life-science, preferentially neuroscience, neurobiology or related areas. Experimental experiences in neurosciences (neurophysiology and/or behaviour) are a prerequisite. Data analysis and programming skills using MATLAB/Python/R etc. are strongly preferred and thus applicants with strong experimental skills and a flair for handling large datasets are particularly encouraged to apply.

Application:
Either, submit your application in a single PDF file containing a cover letter stating your research experience and interests, career goals (max 2 pages), CV, two letters of recommendation and academic transcripts to: Prof. Dr. Alexander Groh, Institute of Physiology and Pathophysiology, Heidelberg University, Im Neuenheimer Feld 326, 69120 Heidelberg. Tel.: +49 6221 54 4050, Email: groh@uni-heidelberg.de

Or apply online: https://my-hbigs.uni-heidelberg.de/site/index.php?a=NDFfMl85NzBfMV8wXzJfMF8wXzFfMV8wXzBfMzM1NTQ0MzFfMF8wXzBfMF8wXzBfMF8wXzBfMF8wXzBfMF8wXzBfMF8wXzBfMF8w