



HEIDELBERG FACULTY OF MEDICINE

PhD student position (f/m/d)

The **Institute of Physiology and Pathophysiology** is part of the Medical Faculty of Heidelberg University. The scientists of the Institute participate in various national and international collaborative research projects and teach the subject of physiology to about 450 students of medicine and dentistry annually. Research focuses on the physiology and pathophysiology of the cardiovascular, muscular and nervous system.

The research group "Neurovascular Research" (Prof. Dr. Hugo H. Marti), affiliated with the Department of Cardiovascular Physiology (Head: Prof. Dr. M. Hecker) at the Institute of Physiology and Pathophysiology, Heidelberg University, Germany, is looking for a highly motivated PhD student (f/m/d). The position is funded by the Deutsche Forschungsgemeinschaft (DFG) for 3 years and offers a **TV-L E13 (65%)** salary. The position is situated within the DFG Research Project "Role of the PHD2-HIF-VEGF/Epo axis in neurons for neuroplasticity and functional neurological recovery long-term after stroke", led by Priv.-Doz. Dr. Reiner Kunze.

The position is available from **1 March 2021**.

Project description:

Stroke is the second most common cause of death and major cause of long-term disability worldwide. However, apart from physical therapy and cognitive training, there is no therapeutic approach with proven clinical efficacy available that aims to promote brain tissue regeneration and long-term convalescence of neurological functions in stroke patients. Thus, there is an unmet need for the development of new long-term drug therapies that work synergistically with the currently available acute neuroprotective treatments. Our previous work confirmed that activation or inactivation of the hypoxia-inducible factor (HIF) signaling pathway in neurons has fundamental consequences for the brain tissue damage and functional recovery in the acute stage after ischemic stroke. In consequence, the present project aims to clarify whether the prolyl-4-hydroxylase domain (PHD)/HIF oxygen sensing machinery controls long-term regenerative processes in the central nervous system post-stroke as well. Along this line, following main issues will be addressed: (i) influence of cell-specific genetic ablation of PHD2 and HIF- α in neurons for neuroplasticity and functional recovery after stroke, (ii) importance of HIF-dependent activation of vascular endothelial growth factor (VEGF) and erythropoietin (Epo) for post-stroke neuroplasticity and functional recovery, and (iii) therapeutic efficacy of delayed treatment with PHD inhibitors on structural and functional long-term regeneration after stroke.

References:

Ernst AS et al. *Acta Neuropathol Commun* 7(1):15, 2019
Bartczek P et al. *J Cereb Blood Flow Metab* 37:291-306, 2017
Li L et al. *Neurobiol Dis* 91:221-35, 2016
Reischl S et al. *PLoS One* 9:e84767, 2014
Kunze R et al. *Stroke* 43:2748-56, 2012

Methods that will be used:

- In vivo experiments: mouse model of ischemic stroke, neurobehavioral tests, intracranial injection, drug application, organ isolation and processing
- Electrophysiological recordings from acute murine brain tissue slices
- Histology: micro- and cryotomy, neurohistological and immunohistochemical staining techniques, light and fluorescence microscopy
- Molecular biology: PCR, qPCR, RNA-seq, Immunoblotting, Antibody arrays



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Qualification profile:

- Qualified master or diploma in biology, biochemistry or related fields
- Strong background/interest in the field of experimental neuroscience
- Advanced knowledge of animal experimentation techniques, neurohistological staining methods, fluorescence microscopy, molecular biological and biochemical techniques or high motivation to acquire the necessary skills
- Experience with animal handling (FELASA B certificate or equivalent) is an advantage
- Fluent English, excellent oral and written scientific communication skills, fluency in German is a plus
- Flexibility, ability to work both as part of a team and independently

We offer:

- Expert training for all required methods
- Close supervision and support by the PI
- Regular team meetings as well as in-house methodology seminars and journal clubs
- Participation in national and international scientific meetings
- Stimulating atmosphere within a team of young and enthusiastic scientists
- Excellent international research environment

To apply, please submit a detailed CV, your academic certificates, a personal statement that outlines research interests, past experience and motivation to complete a PhD (3 pages maximum) and letters of recommendation from two referees by email to: reiner.kunze@physiologie.uni-heidelberg.de.

For further inquiries, please contact:

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The deadline for application is **31 January 2021**.

We stand for equal opportunities for women and men. Severely handicapped with the same eligibility will be given priority.