Master thesis project in neuroscience and physiology

The laboratory of Dr. Amit Agarwal at the Institute for Anatomy and Cell Biology, University of Heidelberg, Germany is seeking for a Master's student to work on an exciting project related to neuron-glia interaction and cellular metabolism. This master thesis position is available immediately and could be potentially supported by a HiWi contract. We expect the project to start latest by mid-October 2024.

Requirements:

- Enrolled as a Master's student in Neuroscience, Molecular Biotechnology, Biochemistry or a related biosciences program. Medical students interested in performing a doctoral (MD) thesis can also apply.
- Proficiency in English language.
- Extensive laboratory experience during a bachelor thesis project.
- Strong scientific aptitude and team working spirit.

The applicants with mouse handling certificate course (e.g., FELASA), and hands-on experience in light microscopy and primary cell-cultures will be preferred.

Project Overview:

The aim of the offered master thesis project is to study the molecular and cellular interaction between two major glial cell-types in the brain – namely astrocytes and oligodendrocytes. Such glia-glia interactions studies will be performed using transgenic mouse models, and will be characterized by state-of-the-art microscopy techniques including confocal and 2-Photon microscopy. Semi-automated image analysis combined with AI-assisted three-dimensional structural reconstructions will be used to characterize the sub-cellular features required to main astrocyte-oligodendrocytes interactions. The details of the project will be discussed during the interview.

Key methods and techniques:

- Mouse genetics, histology, and immunohistochemistry,
- Genetically encoded calcium and metabolite sensors,
- Epifluorescence, confocal and multiphoton microscopy,
- Primary glial cell cultures (astrocyte and oligodendrocyte co-cultures),
- Metabolic flux analysis – Metabolomics and Seahorse assays on cells and organelles,
- Image analysis – machine learning-based image segmentation and 3D reconstruction.

Please send your application latest by **15th August 2024** to amit.agarwal@uni-heidelberg.de with the following documents as a single PDF file:

- **Cover letter**: 1 page letter describing the motivation for doing master thesis in our group.
- **Curriculum Vitae** (CV) including academic achievements and research experience.