



Master student human biology / biochemistry or biophysics

18.12.2019

Impact of Aquaporins on cell volume change in the cardiovascular system
University of Greifswald

A master project dedicated to study cellular volume changes in the cardiovascular system is available from spring 2020 at the University of Greifswald, Germany.

We are looking for a highly motivated student in (human) biology, biochemistry, biophysics or a related field for a Master project in single cell mechanobiology. The student will work in an interdisciplinary team of international scientists at the interface of biology, engineering and physics at the Innovation Centre of Humoral Immune Response in Cardiovascular Disorders (ZIK HIKE), University of Greifswald, Germany.

ZIK HIKE is an interdisciplinary institute and a joint project of the faculty of natural sciences and the faculty of medicine at the University of Greifswald. Here, the laboratory of Biomechanics headed by Dr. Oliver Otto focuses on studying the mechanical properties of cells. We explore fundamentally relevant biological questions developing and applying state-of-the art biophysical and nanotechnological methods.

The project aims to investigate the physiological effect of volume changes induced in blood cells passing the cardiovascular system. Using an Aquaporin 8 knockout / overexpression model system of the myeloid precursor cell line HL60, cells will be exposed to different conditions inside microcapillaries and investigated by flow cytometry, microscopy and other cell biology techniques. This includes real-time deformability cytometry (RT-DC) as a label-free method to measure physical cell properties (Otto, 2015). Ultimately, we would like to understand if volume changes on time scales relevant for cell transport induce functional alterations. This could potentially lead to a new biomarker for innate immune response, where it has already been shown that the lung capillary network is used to regulate cell priming and depriming. The student will work with suspended cell lines as well as primary cells as a model system and will be introduced to CRISPR/Cas9, western blot, RT-DC, microscopes, flow cytometers as well as cell sorting equipment.

More information can be found at www.biomech-hgw.org. Funds for a part-time student job (Wissenschaftliche Hilfskraft) are available to cover living expenses if applicable.

Please submit your application until January 17, 2020 containing a cover letter and CV to Dr. Oliver Otto via e-mail (oliver.otto@uni-greifswald.de).