Helmholtz Centre for Infection Research | Department of Cell Biology
Inhoffenstraße 7 | 38124 Braunschweig | Germany

Master thesis in life sciences

Topic: Cell Biology, Genome Editing, Autophagy and Infection

The Science Campus South **Helmholtz Centre for Infection Research**, based in Braunschweig, conducts cutting-edge research in the field of infectious diseases. We develop novel methods and strategies to recognize and combat infectious diseases ever faster and more effectively. Our common goal is to find new approaches to the prevention, diagnosis and treatment of infectious diseases. This also includes mechanistic research into the molecular basis of infectious diseases. Our research centres on bacterial and viral pathogens and their interaction with the immune system. This also includes the subject areas of epidemiology, immunology, as well as compound- and vaccine research.

The Department of **Cell Biology** currently comprises 4 scientific groups as well as the central units for electron and light microscopy. In the groups, we deal with cell movement processes during host-pathogen interaction. The current call for applications concerns the **Cell Biology** group headed by **Theresia Stradal**. Cells change their shape and motile behavior not only during differentiation, but also during **inflammation** or **infection**. We study motile processes that accompany specific cell differentiation steps, such as the polarization of macrophages, or differentiation of osteoclasts, of neurons, or the formation of the intestinal epithelial barrier. The common denominator is always a reorganization of the cytoskeleton, which constitutes or accompanies cell differentiation. CRISPR/Cas9-mediated **genome editing** has revolutionized our possibilities to generate knockouts in any somatic cell type. The current project focusses on the actin regulatory proteins WASH, WHAMM and JMY that are all involved in both, assembling actin filaments on the cell's inner membranes and **autophagy**. Deregulation of autophagy has significant effects on neurodegeneration, infections or metabolic diseases. In this exciting, **interdisciplinary** project, we work on selected motile processes that occur during vesicle trafficking and host-pathogen-interactions.

What you do with us

- You will participate in the establishment of cell lines lacking the expression of selected cytoskeletal regulators that are then analyzed for cellular phenotypes and selected host pathogen interactions.
- You apply existing protocols for the **transfection** and **cloning** of these cells
- You optimize protocols for the **characterization** of newly generated and existing genome edited cell lines using molecular (qPCR, NGS), SDS-gel electrophoresis, Wester Blotting and microscopic methods including live cell living imaging
- You perform infection assays using different pathogens under BSL2 conditions

What you bring with you

- Degree program in biology, biomedicine, biotechnology or similar
- Experience in sterile work with cell cultures
- Knowledge of microscopy and image analysis is an advantage
- Confident written and spoken German and English skills
- A supervisor from your local University who supports an external Master thesis

What you can expect

- A strong **team culture** with flat hierarchies is a matter of course for us. This means: high esteem and trust
- Professional **supervision** and technical support in the preparation of your student research project/thesis
- **Insight** into the current challenges of infection research

We value and promote the diversity of our employees and their skills and therefore welcome all applications - regardless of age, gender, nationality, ethnic and social origin, religion, ideology, disability, sexual orientation and identity. People with severe disabilities are given preference if equally qualified.

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