

The **Institute for Molecular and Cellular Anatomy (MOCA)** is seeking a

## PhD student (m/f/d)

for the project Stress-protective properties of intermediate filaments in the intestinal epithelium of *Caenorhabditis elegans*.

The position is open starting as soon as possible. The compensation will be according to German EG 13 TV-L for 65% and one year with option of extension.

Epithelia delimit the body against the surrounding environment. They serve as barriers that allow selective molecule exchange. Cell-cell adhesion complexes are essential for maintaining the barrier. The function of the different types of associated filaments, which link the adhesion sites to the cytoskeleton, is currently not understood.

The aim of this project is to find out how the linkage between adhesion sites and the intermediate filament cytoskeleton affects the protective barrier in the intestine. The nematode *Caenorhabditis elegans* will be used as a model, because it presents a unique distribution and composition of its intermediate filament cytoskeleton in all of its 20 intestinal cells. The intestinal intermediate filaments, which are composed of 6 different polypeptide subunits, are anchored at the *C. elegans* apical junction and are enriched below the intestinal lumen. Initial experiments support our working hypothesis that the intestinal intermediate filament cytoskeleton protects against different types of stress (Geisler et al., 2016, 2019, 2020).

### Your tasks

- Generate reporter strains using Crispr to study the distribution and dynamics of fluorescently-labelled intermediate filaments in vivo with different microscopic setups (apoptome, confocal microscopy with Airy Scan, lightsheet)
- Generate intermediate filament knockouts to examine consequences on intestinal anatomy and function using different light and electron microscopic techniques
- Investigate the stress sensitivity of intermediate filament knockouts using confrontation assays with pathogenic bacteria, bacterial toxins and hyperosmotic / oxidative environments
- Generate and analyze knockout animals lacking multiple intermediate filament subunits

The successful candidate will elucidate

- how the targeted knockout of individual intestinal intermediate filament subunits affects intermediate filament network formation and stress-resilience in the intestine,
- whether the loss of multiple intermediate filament subunits elicits additive effects on the morphology, function and stress resilience of the intestinal epithelium, and
- to which degree the intermediate filament network contributes to the overall intestinal barrier function in different stress paradigms.

The results will have direct implications on the situation in vertebrates, which have a comparable organization of their intermediate filament system and corresponding adhesion sites in the intestine.

### Profile

We are seeking applicants who have completed a diploma or master's degree in biology or a related life science field, who have experience in molecular biological techniques, microscopic examination methods and in working with model organisms, and are interested in cell biological questions. Independent work is expected and a PhD should be sought.

Further information can be found at [www.moca.rwth-aachen.de](http://www.moca.rwth-aachen.de).

The RWTH Aachen University is certified as a family-friendly university and offers a dual career program for partner hiring. We particularly welcome and encourage applications from women, disabled people and ethnic minority groups, recognizing they are underrepresented across RWTH Aachen University. The principles of fair and open competition apply and appointments will be made on merit.

Please send your application including names and contact data of two referees by **06.12.2020** naming the reference code **GB-P 26095** to Mr. Dr. Florian Geisler, Institute of Molecular and Cellular Anatomy, Wendlingweg 2, RWTH Aachen, D-52057 Aachen.

For further information please contact Mr. Dr. Florian Geisler, Fon.: 0241-80 88927, E-Mail: [fgeisler@ukaachen.de](mailto:fgeisler@ukaachen.de).