

**The SFB1403 is seeking applications for**

**1 MSc student (f/m/d)**

**for a Master Thesis project with the title:**

**Substrates of a potential bacterial effector protease:  
Searching for conserved targets in mammal and plant  
immune pathways**

**to start as soon as possible.**

*Keywords: Biology, Immunity, Plant Biology, Biochemistry*

The SFB 1403 aims to unravel molecular mechanisms of regulated cell death (RCD). A special focus lies on the connection between animal and plant cell death processes. This SFB 1403 granted Master project is led by a team of two Postdocs and one PhD student. We are looking for a motivated Master's degree student to join our team at the earliest opportunity!

#### **Background and aim of the project**

To promote virulence, pathogens manipulate the host immune system by injection of effectors which can target various components of the immune system. Important immune suppressors are effector proteases that cleave immune relevant proteins and therefore prevent the cell from undergoing defense mediated RCD (see PMID: 33640987). Some pathogens of animals possess the ability to also colonize and infect plants. Literature data suggests that effectors might target functionally conserved substrates, implying unanticipated parallels. By bioinformatic means, we identified a promising candidate protease to test this hypothesis. To do so, we will combine different molecular methods for introducing the protease into human and plant cells and determine altered cleavage sites and thereby specific substrate candidates using mass spectrometry methods established in our laboratory at Forschungszentrum Jülich. The identification of shared substrates in animal and plant cells will reveal similarities between animal and plant RCD and contribute to the understanding of the complex mechanisms that drive RCD.

### Your tasks

- *in vitro* incubation of recombinant protease with HeLa cell cultures and plant extract
- Western blot analysis with specific antibodies
- Mass spectrometry including methods for N-termini enrichment
- Transient protein expression in HeLa cells
- Handling of plant pathogenic bacterial strains and bacterial growth assays
- different methods for verifying cell death (e.g. ion leakage assay)

### Your profile

- Master student in Biology, medical Biology or closely related discipline
- High level of motivation and reliability
- Collaborative work attitude and flexibility
- Knowledge and laboratory experience is highly recommended
- Very good oral and verbal communication skills in English, fluency in German is beneficial

### Our offer

- A highly motivated team of young researchers associated with three different institutes
- An interesting proof of concept study project as part of the SFB 1403
- The opportunity to work in three different laboratories: The biomedical oriented Institute for Medical Microbiology, Immunology and Hygiene (IMMIH) in Cologne, the Institute for Plant Sciences in Cologne and the Central Institute for Engineering, Electronics and Analytics (ZEA) in Forschungszentrum Jülich
- A part-time contract as student assistant

### Contact

If you are interested, please send your application (motivation letter, CV and academic transcripts) per Email to:

Melissa Mantz (m.mantz@fz-juelich.de)  
Central Institute for Electronics and Analytics  
ZEA-3 Analytics  
52425 Jülich