

The Max Planck Institute for Developmental Biology in Tübingen is a world-renowned research institute of the German Max Planck Society. The Department "Microbiome Science" of Prof. Dr. Ruth E. Ley is studying the evolution of host-microbial interaction.



## **Masters Position in Molecular Biology (m/f/d)**

### **The position:**

We present a unique Masters project aimed at elucidating the binding dynamics in interactions between Flagellins and Toll-Like Receptor 5 (TLR5). This will improve our understanding of key factors influencing immune responses initiated by our innate immune system.

### **The project:**

The Toll-like receptor 5 protein is a crucial component of the innate immune system, responsible for identifying bacterial flagellin and triggering an immune response. While numerous studies have explored TLR5-flagellin interactions, few have focused on the specificity of binding and how these specific interactions facilitate immediate downstream responses. Recent work in our Lab has focused on this question, and demonstrated how exposing TLR5 to different flagellins with homologous structures results in a surprisingly diverse range of immune responses. This project will build on our ongoing biochemical and molecular biology analyses by uncovering the effect of the association rate ( $k_a$ ), dissociation rate ( $k_d$ ), and binding strength (KD) of previously-identified flagellins on the TLR5-induced immune response.

### **Description:**

We are seeking an intelligent, motivated and reliable Masters student to determine these binding characteristics utilising Surface Plasmon Resonance (SPR), a dynamic method for measuring the interactions between two or more molecules. This project will involve the expression and purification of a selection of flagellins through *E. coli*, which will be analysed against a TLR5 fragment using a recently obtained Biacore X100 SPR machine. Depending on primary results, the project has the potential to expand in scope to a wider set of flagellins or explore the effects of specific flagellin modifications on these binding dynamics.

The project will be directly supervised by a current PhD student, and is ideal for someone interested in gaining proficiency with several key Cell and Molecular biology techniques, while working in an excellent research environment.

### **Position Requirements:**

- Must have a background in Biology, Molecular Biology, or related fields;
- Must be proficient and comfortable in performing basic laboratory tasks (Following protocols, accurate pipetting, working safely with chemicals, etc.);
- Preferably has experience in Cell/Molecular biology techniques, and/or protein purification;
- Must have excellent English communication skills (Written and Spoken);
- Has prior experience with binding analyses (not required);

The position is available immediately and applications (cover letter, CV, list of references) should be main to [micro\\_admin@tuebingen.mpg.de](mailto:micro_admin@tuebingen.mpg.de). Position is open until filled.