CSC-Tübingen PhD Scholarship Program

2024 application round: prospective PhD positions at the University of Tübingen

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Faculty: Faculty of Science

Institute / Section / Subject: Center for Molecular Plant Science (ZMBP) & Interfaculty Institute of Microbiology and Infection Medicine Tübingen (IMIT) / Microbial Interactions / PhD in molecular plant-sciences and microbiology

Supervising Professor(s): Prof. Dr. Eric Kemen

About the Supervisor(s): The research at Kemen lab focuses on microbial interactions in plant ecosystems. Prof. Kemen received his PhD from the University of Konstanz (2007), before joining Jonathan Jones' group at the Sainsbury Laboratory in Norwich for postdoc. In 2012 he became a group leader at the Max-Plank Institute in Cologne. In 2017 he was appointed full professor (W3) at the University of Tübingen.

Specification: Unraveling mechanisms of microbe-microbe-plant interactions

Topic Description: Several projects are available at the Kemen laboratory:

1. **Mechanism of phyllosphere microbiome-plant interactions under light (UV) stress:** The phyllosphere microbiome promotes stress tolerance of plants, but the mechanism is not well understood. One unique feature of the phyllosphere microbiome compared to rhizosphere and soil is the increased abundance of pigment producing microbes. In this project, we plan to explore the metabolism potential of all pigment producing microbes from our culture collections and investigate the relationship of those pigments with plant light (UV) stress. We will use the cutting-edge resources from ZMBP including genomics, molecular and metabolomics tools, to identify a novel mechanism of microbe ‘suncream’ for plant light stress tolerance.
2. **Investigating the mechanism of disease protection by green algae:** An important topic in the microbiome field is to explore novel microbe-microbe interaction based mechanisms for plant disease protection. During our gnotobiotic experiments we could always identify a green algae from genus *Chlamydomonas* that can strongly inhibit the infection of obligate pathogen *Albugo laibachii*. Since the green algae is known to have the enzyme degradation capacity to other microbes, we hypothesize that it can also inhibit the colonization of different microbes via quorum quenching. We plan to use multi-omics and molecular approach to dissect this quorum quenching mechanism.

Required Degrees: MSc in Biology, bioinformatics or similar

Language Requirements: English (TOEFL iBT 95 or IELTS 6.5 or equivalent)