



Open position for the LSM call of applications

Department/Institute: LMU Faculty of Biology, Genetics

Subject areas/Research fields: Plant Sciences, Genetics, Molecular Biology, Computational Biology

Keywords: gene regulation; plant-plant interaction; elicitor

Name of supervisor: Prof. Dr. Claude Becker

Project title: Induction of defence compounds in rice by fungal elicitors

Project description:

Plants mostly grow in dense communities, together with plants from the same or a different species. Because resources are scarce, plants must compete with their neighbours for nutrients, space, and water. Some plant species, including important crops such as rice, release chemical compounds to inhibit the growth of neighbours and to defend themselves against various pests.

Upon perceiving a chemical trigger, rice plants produce and release a particular type of diterpenes, momilactone A and B, that act against fungal pathogens as well as against non-kin plant species (Serra Serra et al. 2021). In this project, our goal is to identify the molecular trigger(s), the mechanism by which they are perceived, and the signalling cascade that ultimately leads to the enhanced production and release of the compounds. To this end, we employ a combination of genetics, genomics, biotechnology, and metabolomic analyses. In collaboration with microbiologists and biochemists, we will test an array of fungal extracts and filtrates from both beneficial and pathogenic fungi; via iterative fractionations and purifications, we aim to identify the specific molecules that trigger the response. Using reporter lines, mutant collections, and CRISPR/Cas9 technology, we will then focus on identifying the components of the signalling cascade.

The project is embedded in a group with very diverse expertise, ranging from Bioinformatics and Genomics to Plant Genetics and Biochemistry. We are looking for candidates with a solid background in molecular biology and genetics; expertise in computational data analysis and/or plant biology is a plus. Candidates should have an advanced level in spoken and written English.

References:

Serra Serra, N., Schanmuganathan, R., Becker, C. (2021) Allelopathy in rice: a story on momilactones, kin recognition, and weed management. *J Exp Bot*, erab084, DOI: 10.1093/jxb/erab084.

Schandry, N., Becker, C. (2019) Allelopathic plants – models for studying plant-interkingdom interactions. *Trends Plant Sci*, 25: 176-185. DOI: 10.1016/j.tplants.2019.11.004

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Research group website:

<https://www.genetik.bio.lmu.de/research/becker/research/index.html>

Apply: Please send your application through the [online portal](#) of the Graduate School Life Science Munich (LSM).