Open position for the LSM call of applications

Department/Institute: LMU Faculty of Biology, Plant Genetics

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

Keywords: plant-microbe interactions, bacterial multidrug resistance, plant secondary metabolites, legume-rhizobium symbiosis

Name of supervisor: Prof. Martin Parniske

Project title: The impact of plant antibiotic metabolites and bacterial multidrug resistance genes on the root microbiota composition

Project description:

Plant species differ widely in the chemical spectrum of phytochemicals with antimicrobial properties ("antibiotics") they produce. This may be one of the reasons, why soil bacteria are a major reservoir of antibiotic resistance genes. This project aims to explore to what extend such resistance genes contribute to bacterial survival and competitiveness in and on toxin-producing roots. To this end, we will identify a) toxic compounds from root exudates in collaboration with experts in plant metabolite analysis and chemistry and b) bacterial resistance genes that protect against these. To determine the impact of specific compounds with antibiotic activity on the root microbiome composition, the project will, among other tools, employ plant mutants defective for their biosynthesis. On the bacterial side, we will study the contribution of bacterial multidrug resistance (MDR) genes to increased resistance against specific plant-derived toxins and thus to successful root colonization and competition with other microbiota. We aim to determine whether specific antibiotic compounds within the host root exudate in combination with cognate bacterial antibiotic resistance genes determine not only microbial survival in the rhizosphere but also contribute the host specificity of the legume-rhizobium symbiosis. The knowledge gained in this project will help informed selection of plant beneficial bacterial inoculants for sustainable agricultural practises.

For further information, please contact: Prof. Parniske, parniske@lmu.de

Reseach group website:
https://www.genetik.biologie.uni-muenchen.de/research/parniske/index.html

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