



## 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:** epigenetics; epigenomics; DNA methylation; plant microbiome

**Name of supervisor:** Prof. Dr. Claude Becker

**Project title:** Epigenomic associations with plant-microbe interactions

### Project description:

Plants grow in a diverse community with microorganismic interactors, which range from pathogens to beneficial symbionts. In recent years, it has become apparent that the plant epigenome, the combination of chemical modifications to DNA and histones, plays a role in modulating both pathogenic and symbiotic interactions (reviewed in Ramos Cruz et al., *Curr Opin Plant Biol* 2021).

In this project, we want to identify which epigenomic loci are associated with the overall plant microbiome profile. Using a set of well-characterized *Arabidopsis thaliana* lines that have mosaic DNA methylation patterns, we will profile the overall root and leaf microbiome of these plants when grown in the same soil using metagenome sequencing via 16S rRNA and ITS profiling. We will then map microbial diversity and relative abundance to the epigenomic variation and combine these analyses with de novo generated transcriptome profiles. Our goal is to identify loci that are subject to epigenetic regulation and that modulate the overall interaction with microbial organisms. In a second phase, we will transition from the *A. thaliana* model to crop plants.

The project is embedded in a group with very diverse expertise, ranging from Bioinformatics and Genomics to Plant Genetics and Molecular Biology. 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:

Ramos-Cruz, D., Troyee, D., Becker, C. (2021) Epigenetics in plant organismic interactions. ***Curr Opin Plant Biol***, 61: 102060. DOI: 10.1016/j.pbi.2021.102060

Wibowo, A. \*, Becker, C. \*, Durr, J., Price, J., Spaepen, S., Hilton, S., Putra, H., Papareddy, R., Saintain, Q., Harvey, S., Bending, G.D., Schulze-Lefert, P., Weigel, D., Gutierrez-Marcos, J. (2018) Partial maintenance of organ-specific epigenetic marks during plant asexual reproduction leads to heritable phenotypic variation. ***PNAS***, 115: E9145-9152. <https://doi.org/10.1073/pnas.1805371115>

**For further information, please contact:**

Prof. Claude Becker, [claude.becker@bio.lmu.de](mailto:claude.becker@bio.lmu.de)

**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).