

**PhD position: Multi-omic analysis of heterosis in *A. thaliana***

A PhD position is available in the Johannes lab at the Technical University of Munich.

*Description:* Heterosis (or hybrid vigor) is a important phenomenon in genetics where hybrid plants show “better” phenotypic performance relative to their two parents (i.e. they are taller, have larger leaves, yield more seeds, etc.). Although this phenomenon has been exploited extensively in commercial crop breeding for decades, its molecular mechanisms are not completely understood. Previous work in our lab has shown that epigenetic factors, such as DNA methylation, have an important role in heterosis. We have recently generated a large population of experimental hybrids in the model plant *Arabidopsis* and phenotyped >20k plants using an automated phenotyping platform. In this project we will analyze the methylomes, transcriptomes and small RNA profiles of a large sample of these hybrids, and integrate these data with our phenotypic measurements. Our goal is to understand how DNA methylation differences between parents determine heterotic phenotypes in their offspring, and how these parental differences contribute to functional re-modeling of hybrid genomes. This project uses a unique combination of high-throughput phenotyping, next generation sequencing and quantitative genetic analysis.

*What are we looking for:* The prospective candidate will be in charge of integrating data from methylomes, transcriptomes, small RNAs with phenotypic measurements from a large number of hybrids and their parental lines. Training and support will be available for all segments of this project. We are particularly interested in applicants with a background in bioinformatics, computational biology, statistics (or related fields). However, biologists with knowledge of programming and next-generation sequencing data analysis are also encouraged to apply.

*Location:* The Johannes lab is embedded in the TUM School of Life Sciences, and is a member of the Collaborative Research Centre (SFB 924) “Molecular mechanisms regulating yield and yield stability in plants”. We are also part of the prestigious TUM Institute for Advanced Study. The TUM is rated among the best in Germany and ranked well internationally. The Freising Life Sciences campus is located about 20 minutes from the city center of Munich and 15 minutes from the Munich international airport.

*Application:* Send your application directly to [work@johanneslab.org](mailto:work@johanneslab.org). The application should include: 1) a full CV, 2) a short statement of research interests and experience, and 3) contact information for two references (preferably everything in a single pdf file).

*Application deadline:* April 15, 2020, but applications will be accepted until the position is filled.

*Salary:* The salary is 65% of a standard E13 pay scale depending on qualifications. The TUM is interested in fostering career opportunities for women, therefore women are strongly encouraged to apply. Applicants with disabilities and more or less equal qualifications will be favoured.

***Relevant links:***

Johannes group: [www.johanneslab.org](http://www.johanneslab.org), <http://www.epi.wzw.tum.de/>

Technical University of Munich (TUM): <https://www.tum.de/en/homepage/>

SFB924: <http://www.sfb924.wzw.tum.de>