# EXPERIENCE IN COLLABORATIVE SCIENCE

My PhD project was a part of the large consortium, where eight groups from universities screened the same population of Arabidopsis accessions under various stress conditions and performed multi-trait GWAS. This collaborative team included molecular biologists, geneticists, statisticians and computational biologists, and each university had individual collaboration with commercial partner. Our group focused on studying effects of salt stress on root system architecture and collaborated with R&D team from ENZA Zaden. I learned how to present my results in front of various audiences, what are the aspects of fundamental research that are important for the breeding company, and how to collaborate with various types of people and institutions. This project resulted in one collaborative publication[[1]](#footnote-1). During my time as a PhD I also collaborated with my direct colleagues (Dr. Galvan-Ampudia, Dr. Kawa and Dr. McLoughlin), but also extended my collaborations to Institute for Biodiversity (Prof. Schranz, Dr. Wei), and international collaborators (Prof. Salt, Dr. Danku, Uni. Nottingham). All of those collaborations resulted in publications in peer-reviewed journals. Currently I am still collaborating with my former colleagues (Prof. Testerink’s lab) providing expertise on GWAS and *in silico* analysis. During my PostDoc I developed multiple collaborations with specialists in plant modeling (Dr. Lobet, Jurlich/Louvain Uni.), electrophysiology (Caitlin Byrd, Adelaide Uni./ANU), high-throughput phenotyping (PSI, Czech Republic) and abiotic stress in tomato (Prof. Assins, VIAR, Valencia). As I am supervising two PhD students, I also initiate collaborations, which are improving the research done primarily by my students. Those collaborations include implementing more complex GWAS models (Prof. Korte, Wurzburg Uni.), auxin signaling (Prof. Gray, Uni. Minnesota) and the role of flavonols in heat acclimation (Prof. Muday, Wake Forest Uni.). My collaborations within KAUST include applied mathematicians (Dr. Ait-Haddou) and colleagues working on strigolactones (Prof. Babili). I led a team of five PhD students where together we worked on designing the pipeline for data curation and alaysis (MVapp). Currently, I also share my expertise in high-throughput phenotyping with other colleagues in my department in non-formal collaborations, helping them design and set up their experiments. My experience so far thought me how to personalize my communications with the students and various collaborators, effectively deliver feedback and communicate with colleagues carrying very different cultural and academic norms and expectations. I believe that recognizing differences between individuals and working with those differences will allow for more creative and effective science.

The proposed research for BTI and my background in forward genetics, stress physiology, and high-throughput phenotyping will be complementary to the ongoing research at BTI. In particular, I see collaboration possibilities with the groups working on other plant-developmental processes, such as auxin homeostasis during fruit development (Prof. Catala’s lab) and biotechnology approaches to study crop improvement (prof. van Eck’s lab). I am confident that identification of salt-induced changes in fruit development will lead to new targets for crop improvement. My research in Arabidopsis on root-to-shoot ratio alterations in response to salt stress identified genes involved in chlorophyll degradation. Therefore, I consider collaboration with Prof. Stern’s lab on the role of chloroplast stability in salt-induced signaling leading to altered plant architecture. I am confident that my expertise in constructing open-source data analysis pipelines will form a great collaboration platform with the groups of Prof. Fei and Prof. Mueller, promoting open-science and expanding “classical” data analytic pipelines. Finally, I consider that my interest in plant architecture and unique ways of describing plant architecture using fractal derived methods will give rise to collaboration with Prof. Li’s group, where together we could study the evolutionary processes shaping fern morphology. The proposed full-plant phenotyping system and contribution model will be possibly of interest to larger group of colleagues and collaborators working on plant interactions with biotic agents, including myrorrhizal symbionts (Prof. Harrison’s lab), plant pathogens (Prof. Heck’s lab, Prof. Klessing’s lab and Prof. Martin’s lab), viruses (Prof. BLissard) and herbivores (Prof. Jander’s lab); as well as effects of epigenetic regulation (Prof. Richards’ lab) and biogenic small molecules (Prof. Schroeder’s lab) on plant architecture. The funding for this research will be obtained from fundamental research grants (NFS). As the research will be performed on the close relative of commercial tomato, I also consider that possible funding opportunities will include commercial partners, including biotech and breeding companies, which can be further supported with the government and regional grants (e.g. USDA-NIFA). The individual components of my research vision are also suitable for short-term Master and PhD projects.

1. Thoen et al., 2017 New Phytologist [↑](#footnote-ref-1)