

INTEG RNA - Seed Funding for collaborative research projects

Investigating the role of mRNA alternative splicing for the thermoresponse in seeds

Collaboration with Andreas Wachter, JGU Mainz, Germany

The seed funding initiated a collaboration with the lab of Andreas Wachter (JGU Mainz, Germany) to investigate the effects of elevated temperatures on the alternative splicing of pre-mRNA transcripts in Arabidopsis seeds. With the help of the Wachter lab, we took a candidate gene approach and listed genes that may be alternatively spliced during seed development in plants cultivated under stress conditions.

This analysis was combined with a secondment of one month of J. F. Sánchez López (PhD candidate) in the Wachter lab. In preparation of this secondment, RNAs were extracted from Arabidopsis seeds at 3 days after pollination (normal and stressed conditions). And cDNA libraries were prepared according to a protocol shared by the Wachter lab. Screening oligos were designed for the candidate genes and tested in our lab. During the secondment, the cDNA libraries were screened to transcript isoforms by RT-PCR and bioanalyser. Promising isoforms were sequenced for validation.

Given those results, we sequenced the transcriptome of seeds at 2 and 3 days of pollination in standard and stressed growth conditions, in wild-type plants and in mutant plants affected in the regulation of splicing. The bioinformatic analysis is under progress.

During his secondment, J. F. Sánchez López learnt valuable methodologies and transferred our protocol of heat stress treatment of seedlings to the members of the host lab. Collaboration is on-going with the participation of Andreas Wachter as external member of the Thesis Advisory Committee of Oussama Guennich, PhD candidate (started in November 2023). The project of Oussama Guennich is a direct continuation of the work started during this seed project.