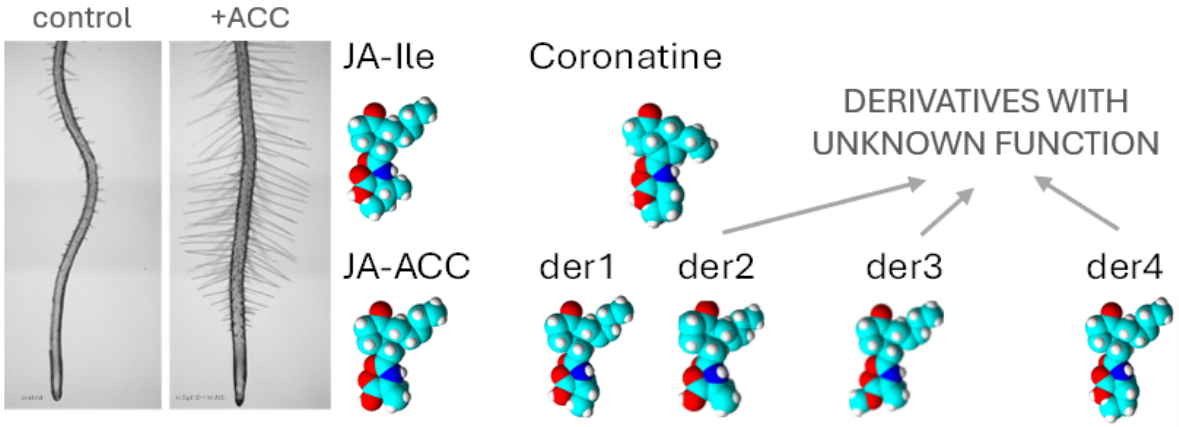
HOW DOES ACC REGULATE PLANT GROWTH AND STRESS RESILIENCE, INDEPENDENT OF ETHYLENE?

The phytohormone ethylene is a crucial player in stress control. There is clear and recent evidence that ACC, the precursor of ethylene, occurs as different metabolites *in planta* and acts as an ethylene-independent signaling molecule as well. This discovery is changing our perspective of how the ACC-ethylene pathway controls growth and resilience, and could lead to new candidate genes for targeted crop improvement.
During your thesis, you will contribute to unravelling the biosynthetic and metabolization pathways of ACC. You will use a combination of analytical chemistry (UPLC-MS/MS, mass spectrometry imaging by DESI), molecular biology (cloning, binding and competition assays) and microscopy (live cell fluorescence imaging, phenotyping assays) to evaluate the function, dynamics and whereabouts of newly identified ACC metabolites in the plant, in control and stress conditions. In addition, you will address the hormonal cross-talk between ACC and the jasmonate signaling pathway, a key feature of the plant's stress response.
Your results will contribute to our understanding of how, where and when ACC and its conjugates regulate normal plant growth and the plant's ability to respond to different abiotic stress conditions.

During your thesis period, you will receive continuous and constructive mentoring. We have an open-door policy and take pride in progressing science through teamwork. You will take active part in an ongoing state-of-the-art project.



Methods:

- Identification and quantification of metabolites using UPLC-MS/MS
- *In situ* mass spectrometry by DESI (state-of-the-art MS-imaging)
- Binding and competition assays
- Plant growth quantification using digital image analysis
- Bright-field and live-cell confocal laser scanning microscopy

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