

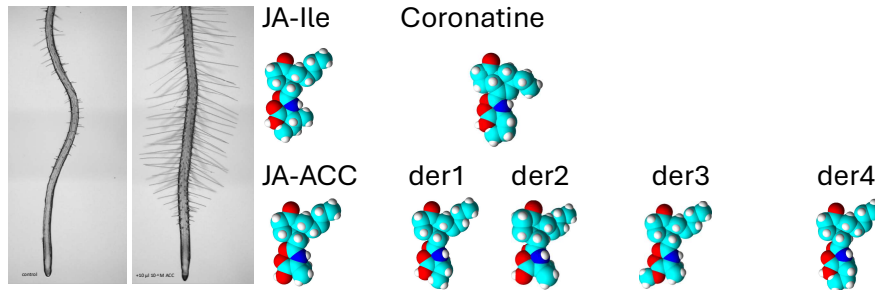
ACC, A signaling molecule neglected for 50 years

Description

The phytohormone ethylene is known to be a crucial player in stress control. Apart from being the direct precursor of ethylene, there is recently clear evidence that the non-proteinogenic three-membered ring alpha-amino acid ACC, occurs as different metabolites *in planta* and acts as a signaling molecule independent of ethylene. ACC can be considered a signaling molecule neglected during the 50 years since its discovery.

This project aims to unravel the biosynthetic pathway and further metabolization of ACC into the different conjugates. The function of these identified metabolites will be further evaluated to answer the questions how and under which form ACC regulates normal plant growth and the responses under different abiotic stress conditions.

Experiments used will involve UPLC-MS/MS for the identification and quantification of ACC metabolites, the recognition of different ACC metabolites by the recently identified ACC transport protein LHT1, the role of individual metabolites in specific ethylene- involved processes such as root formation and root hair development, the quantification of the steady state level of ACC and metabolites under different stress conditions, and finally the cross-talk between ACC and the Jasmonate signaling pathway.



Methods

- Identification and quantification of metabolites using UPLC-MS/MS
- *In situ* mass spectrometry by DESI
- Binding and competition assays
- Plant growth analysis using digital image analysis
- Bright-field and confocal laser scanning microscopy

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