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Root of an ACC mutant grown  
on isoxaben

### **CRISPR/Cas9 Mediated Disruption of Genes that Regulate Levels of 1-Aminocyclopropane-1-Carboxylic Acid (ACC) in *Arabidopsis thaliana* to Study the Role of ACC Signaling in Plants**

Ethylene is a gaseous plant hormone that regulates many aspects of plant growth and development. 1-aminocyclopropane-1-carboxylic acid (ACC) is well-known as the immediate ethylene precursor, but its non-canonical role hasn't been well-elucidated. Previous studies have implicated ACC as a signaling molecule in a novel pathway regulating cell wall synthesis in *Arabidopsis thaliana*. ACC is synthesized from S-Adenosyl methionine (AdoMet) by ACC synthase (ACS), and is converted to ethylene by ACC oxidase (ACO). Using CRISPR-Cas9, the eight functional ACS genes and five functional ACO genes were disrupted in separate plant lines, and confirmed using restriction digest and agarose gel electrophoresis. CRISPR-Cas9 gene editing has been successfully used to disrupt all ACS and ACO genes, but not in the same plant line. Obtained higher-order mutant lines will be used to study the effect of low and high levels of ACC on cell wall perturbations. This can be used to determine potential downstream effectors of ACC and shed light on its non-canonical role as a regulator of cell wall synthesis.