

Public Abstract

First Name:Matthew

Middle Name:Jacob

Last Name:Salie

Adviser's First Name:Jay

Adviser's Last Name:Thelen

Co-Adviser's First Name:

Co-Adviser's Last Name:

Graduation Term:SP 2016

Department:Biochemistry

Degree:PhD

Title:Discovery and characterization of regulatory mechanisms affecting the heteromeric acetyl-coenzyme A carboxylase in Arabidopsis

Vegetable oil is an important global commodity that is used not only for food, but also for biofuels, plastics, cosmetics, and other industrial uses. The process of producing and storing these oils in the seeds of crops is known as fatty acid biosynthesis (FAS). One aim of biotechnology research is to find novel ways to increase vegetable oil production in crops by altering the FAS pathway to produce more fatty acids. The work described in this dissertation was performed to understand the regulation of one important enzyme in the FAS pathway: acetyl-coenzyme A carboxylase (ACCase). This enzyme plays a large role in controlling the amount of fatty acids produced in plant seeds. In this work, the known regulatory mechanisms of ACCase are reviewed. In addition, two novel discoveries related to ACCase regulation are described in detail. These discoveries further the scientific understanding of ACCase regulation and will serve as potential targets for future biotechnology research. Further understanding of these discoveries could lead to increased vegetable oil production in crops.