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Gene Editing for Improved Plant Characteristics via Modulation of Suberin Regulators

Tech ID: 32392 / UC Case 2020-541-0

ABSTRACT

Researchers at the University of California, Davis have identified specific genetic modifications to plants that impart a variety of advantages based on modulating the presence of suberin

FULL DESCRIPTION

Suberin is a natural, complex, carbon-rich, biopolymer typically found in the cell walls of plants. Plant walls form physiologically relevant interfaces between the plant and the environment, affecting water and nutrient transport and protecting plants from pathogens. Suberin is present in the internal root tissues of vascular plants, thus playing an important role in the adaptation of plants to terrestrial life. Plants also respond to some external stimuli by modifying the presence of suberin in their root cell walls. However, factors determining suberin deposition and regulation in most plant species remained largely unknown.

Prior research has confirmed that suberin levels affect water use efficiency, surrounding soil carbon sequestration, mineral ion uptake, and other, important, plant-related processes. When stressed, plants also increase their root's suberin levels. Researchers have determined that most crop varieties contain less suberin than their more stress-tolerant, wild relatives. Therefore, a method for controlling suberin deposition in crops via genetic modification would be both scientifically and economically important.

Researchers at the University of California Davis have identified genes involved in the synthesis and modulation of suberin in plants. These genes can be edited to alter suberin production – which can lead to developing new cultivars with enhanced tolerance to stresses ranging from increased soil salinity to drought to pests.

APPLICATIONS

- ▶ Improves plant characteristics via genetic modification of processes involving suberin

FEATURES/BENEFITS

- ▶ Identifies genes responsible for enhanced tolerance to environmental stresses in plant varieties
- ▶ Results have been confirmed in multiple crops of high economic importance

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20230175002	06/08/2023	2020-541

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Genes Controlling Barrier Formation in Roots](#)
- ▶ [Microbial-Induced Barriers To Striga Parasitism](#)

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OTHER INFORMATION

KEYWORDS

suberin, gene editing, plant genetics and breeding, plant genomes

CATEGORIZED AS

- ▶ **Agriculture & Animal Science**
 - ▶ Plant Traits
 - ▶ Plant Varieties
 - ▶ Transgenics
- ▶ **Biotechnology**
 - ▶ Genomics

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