

Energy Crops Engineered for Increased Sugar Extraction through Inhibition of snl6 Expression

Tech ID: 21238 / UC Case 2010-074-0

FULL DESCRIPTION

Pamela Ronald and a team of researchers at the Joint BioEnergy Institute (JBEI) have engineered plants with inhibited expression of snl6, a cinnamoyl-CoA reductase-like (CCR-like) gene. As a result, the JBEI plants have reduced lignin or phenolic compounds compared to wild type plants and yield an increase of up to 10 percent of sugar extracted. The JBEI technology can be applied to a wide range of plants including rice, miscanthus, switchgrass, sugarcane, sugar beet, sorghum and corn, among others.

In addition, the JBEI-engineered plants are developmentally normal. Until now, plants with decreased lignin content have exhibited defects such as reduced size or sturdiness that made them unsuitable biofuel feedstocks.

Lignin significantly hinders the extraction of sugars from plant cells walls for saccharification, a key step in the production of biofuels from cellulosic biomass. The JBEI-engineered plants present less lignin or phenolics than control plants and lack the defects of other engineered species making them a superior biofuel feedstock.

The Joint BioEnergy Institute (JBEI, www.jbei.org) is a scientific partnership led by the Lawrence Berkeley National Laboratory and including the Sandia National Laboratories, the University of California campuses of Berkeley and Davis, the Carnegie Institution for Science and the Lawrence Livermore National Laboratory. JBEI's primary scientific mission is to advance the development of the next generation of biofuels.

APPLICATIONS

- Biofuel feedstock plants

FEATURES/BENEFITS

- Reduced lignin or phenolic compounds compared with wild type plants
- Up to a 10 percent increase in sugar extracted
- Yields developmentally normal plants

RELATED MATERIALS

- [Bart RS, Chern M, Vega-Sánchez ME, Canlas P, Ronald PC. 2010. Rice Snl6, a cinnamoyl-CoA reductase-like gene family member, is required for NH1-mediated immunity to Xanthomonas oryzae pv. oryzae. PLoS Genet. 6\(9\). pii: e1001123.](#)
- [Lawrence Berkeley National Laboratory \(LBNL\) Reference Number: EIO-2763](#)

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20130160161	06/20/2013	2010-074

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OTHER INFORMATION

KEYWORDS

biofuel feedstock, biofuel
feedstock plant, snl6, snl7,
cinnamoyl-CoA reductase-
like gene, CCR-like gene,
reduced lignin, efficient
saccharification, increase
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engineered feedstock
plant, rice, miscanthus,
switchgrass, sugarcane,
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Pamela Ronald, Pam
Ronald, JBEI, energy crops,
Joint BioEnergy Institute

CATEGORIZED AS

- **Agriculture & Animal Science**
- Other
- Plant Traits
- **Energy**
- Bioenergy

- **Materials & Chemicals**
- Agricultural

RELATED CASES

2010-074-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- [Improved Xylan Extraction](#)
- [Novel Peptide Capable of Stimulating Disease Resistance in Plants](#)
- [Improved Saccharification Efficiency by Inhibiting a Xylosyltransferase](#)

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