Synthetic Biology Methods and Systems to Synthesize Strigolactone

Tech ID: 32544 / UC Case 2021-817-0

BACKGROUND

Strigolactones (SLs) are identified as a novel class of plant hormones that control shoot branching, leaf growth and senescence, and promote the formation of lateral root and growth of primary root. SLs thus have been considered as a promising agrochemicals tool for applications such as biostimulants and is newly undergoing development as a medical tool. However, SLs are typically difficult to synthesize in large enough quantities for agrichemical applications.

BRIEF DESCRIPTION

Prof. Yanran Li and colleagues from the University of California, Riverside have developed a biosynthetic method for producing different strigolactones by designing different biosynthetic pathways in engineered microbial systems. The invention includes engineered E. coli - *S. cerevisiae* co-culture systems for the biosynthesis of both non-canonical and canonical SLs, including but not limited to carlactone (CL), carlactonic acid (CLA), 5-deoxystrigol(5DS), 4-Deoxyorobanchol (4DO) and orobanchol. This technology allows SLs to be biosynthetically produced in large scale for use in innovative agrochemicals such as phyto-regulators, fertilizers, biostimulants that enhance the nutrient uptake efficiency.

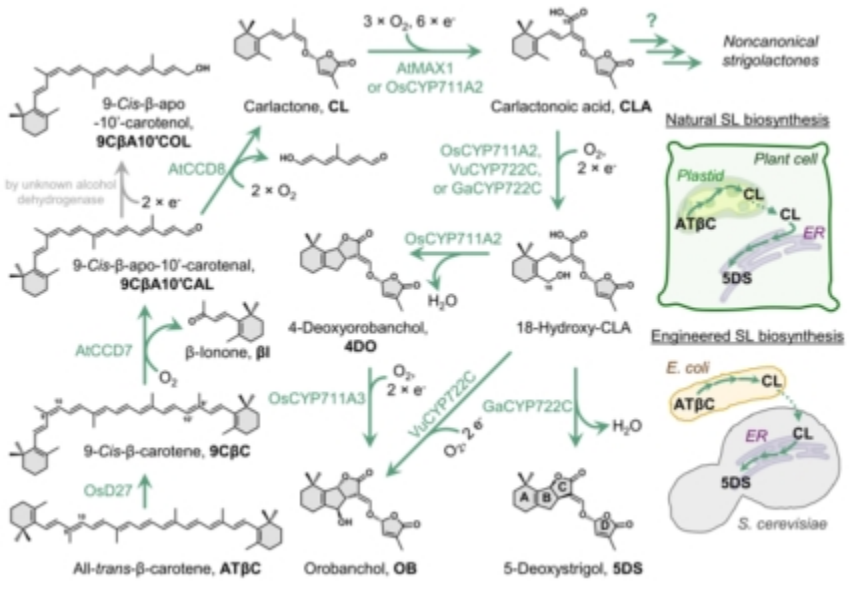

Fig 1: Mimicking plant strigolactone pathway distribution in the engineered *E. coli-S. cerevisiae* coculture.

APPLICATIONS

- For use to scale agrochemical products such as biostimulants and fertilizers
- For use to scale strigolactones as an anti-carcinogen in fields like medicine and biotechnology

PATENT STATUS

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OTHER INFORMATION

KEYWORDS

synthetic biology, strigolactones, carlactone, biosynthesis, natural products

CATEGORIZED AS

- Agriculture & Animal Science
  - Other
- Biotechnology
  - Other

RELATED CASES

2021-817-0

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Published Application	WO 2023/244802	02/08/2024	2021-817

RELATED MATERIALS

- Establishment of Strigolactone-Producing Bacterium-Yeast Consortium; Sheng Wu, Xiaoqiang Ma, Anqi Zhou, Alex Valenzuela, Kang Zhou, Yanran Li; SCIENCE ADVANCES, 2021, Vol 7, Issue 38, DOI: 10.1126/sciadv.abh4048 - 09/17/2021

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