



Industrial *Streptomyces* with Capability to Grow on Cheap and Abundant Cellulose

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WARF: P160252US02

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing modified *Streptomyces* bacteria for the production of high value chemicals, antibiotics and biofuel.

Overview

Many species of *Streptomyces* are used industrially in the production of medicines, proteins and other fine commodity chemicals. However, the vast majority must be grown on high-cost glucose feedstock because they are unable to use cellulosic biomass as a source of nutrition.

One notable exception is a strain called ActE, recently isolated and extensively studied by UW–Madison researchers. The researchers have identified a series of genes that enable the organism to survive on cellulose and other types of biomass, and constructed expression plasmids comprising the most useful genes for producing cellulose-degrading enzymes.

The Invention

Building on their work, the researchers have developed an optimized set of enzymes useful to create *Streptomyces* with the capability to grow on cellulosic polysaccharide substrates. The method enables industrially relevant strains to grow on cellulose as the sole carbon source.

Using an engineered plasmid expression system derived from the ActE strain, the researchers transformed two commercial species (*S. lividans* and *S. venezuelae*) and showed that they were able to grow on filter paper as the sole carbon source. Other suitable host strains include *S. coelicolor*, *S. griseus*, *S. clavuligerus*, *S. hygroscopicus*, *S. viridochromogenes* and *S. avermitilis*.

Applications

- Modified *Streptomyces* for the production of high value chemicals and antibiotics
- Could enable other bacterial species to convert cellulosic biomass into a feedstock for eventual ethanol production

Key Benefits

- Relevance to industrialized strains
- Lower cost feedstocks

Stage of Development

Optimization of the plasmid expression system is ongoing. We are currently pursuing marketing efforts. By continuing to browse without changing your browser settings to block or delete cookies, you agree to the storing of cookies and related technologies on your device. [See our privacy policy.](#)

Additional Information

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For More Information About the Inventors

- [Cameron Currie](#)
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Related Technologies

- [For more information about the researchers' work on the ActE species, see WARF reference number P110314US03.](#)

Tech Fields

- [Clean Technology: Biobased & renewable chemicals & fuels](#)

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854

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