



Microbial Biosynthesis Produces Unique Flavonoids, Chalcones and Stilbenes Used in Nutraceuticals

Technology No. z04007

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Chalcones, Flavonoids and Stilbenes from Lignin Using Microbial Biosynthesis

Microbial biosynthesis of chalcones, stilbenes and flavonoids in engineered microbes offers a production route with greater selectivity and purity than current methods that rely on chemical extraction from plants. In addition, the feedstock for microbial biosynthesis (phenylpropionic acid) can be derived from lignin, an inexpensive agricultural byproduct. Microbial biosynthesis of flavonoids and stilbenes also allows for production of novel compounds that aren't found in nature, either through pathway evolution and extension with additional modifying enzymes, altering the media feed stream, or using fermentation to create intermediates for additional chemical modifications.

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Microbial Biosynthesis Produces Chalcones, Flavonoids and Stilbenes Without Production of Cinnamic Acid

A genetically engineered microbe has been produced that uses a biological pathway for producing chalcones, flavonoids and stilbenes. This pathway bypasses the bottleneck of producing the precursor cinnamic acid, which improves the yield. The use of engineered biosynthetic pathways allows the synthesis of chemical structures that cannot be readily obtained in high yields by chemical synthesis.

Flavonoids and Stilbenes Are Used in the Nutraceutical Field

The most visible application of this technology is in the nutraceutical field, particularly in the production of Resveratrol, the antioxidant in red wine responsible for heart health benefits, as well as Piceatannol, Naringenin, Eriodictyol (cancer prevention antioxidants).

FEATURES AND BENEFITS OF THE MICROBIAL PRODUCTION OF CHALCONES, FLAVONOIDS & STILBENES:

- Allows high-yield production of chalcone and flavonoid structures
- Opportunity to be labeled 100% natural and high-purity compared with natural extracted flavonoids and stilbenes
- Applications in nutraceuticals, particularly Resveratrol, the antioxidant found in red wine
- Biosynthesis in microbes allows manufacturing of flavonoids and stilbenes that aren't found in nature
- Feedstock for microbial biosynthesis can be derived from lignin

Phase of Development E. coli strains have been used for laboratory production and have produced up to 100 mg/L. University strains or a licensee's host strains can now be used for scale-up to commercial production levels.

Researchers: Claudia Schmidt-Dannert, PhD Department of Biochemistry, Molecular Biology, and Biophysics, College of Biological Sciences

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