



Production of cyclic terpenoids

Description of Technology: This invention is in the field of microbiology. More specifically, this invention pertains to methods for the production of cyclic terpenoid compounds in microbial hosts that metabolize single carbon substrates as a sole carbon source.

Patent Listing:

1. **US Patent No. 6,818,424**, Issued November 16, 2004, "Production of cyclic terpenoids"
<http://patft.uspto.gov/netacgi/nph-Parser?Sect2=PTO1&Sect2=HITOFF&p=1&u=%2Fnetacgi%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&d=PALL&RefSrch=yes&Query=PN%2F6818424>

Market Potential: Monoterpenes have value in the flavor and fragrance industries, as components in industrial solvents and in the pharmaceutical industry where selected compounds have shown promise as both chemopreventive and chemotherapeutic agents for solid tumors.

At present the monoterpenes may be obtained either by extraction from natural sources or by chemical synthesis. Both processes are time consuming and expensive. Although small scale production of selected monoterpenes has been demonstrated in microbial hosts, a facile method for the production of monoterpenes on an industrial scale has yet to be reported. For example some monoterpene synthases have been successfully cloned and expressed in *Escherichia coli*. Specifically, limonene synthase, which catalyzes the cyclization of geranyl diphosphate to yield the olefin 4(S)-limonene in *Perilla frutescens* has been cloned into *Escherichia coli* and functionally expressed (Yuba et al. *Arch Biochem Biophys* 332:280-287, (1996)). Reports of microbial expression however have been limited to microbe traditionally used for fermentative production were grown on complex carbon substrates.

A need exists therefore for a method of production of highly valuable monoterpenes from an inexpensive feedstock. Applicants have solved the stated problem by providing a C1 metabolizing microorganism having transformed with a gene encoding a cyclic terpene synthase, having the ability to produce to a variety of monoterpenes.

Benefits:

- Production of monoterpenes from an inexpensive feedstock
- Produces a variety of monoterpenes

Applications:

- Microbiology
- Pharmaceutical industry
- Flavor and fragrance industry

Contact: *Ken Anderson*

*Director, Entrepreneurial & Small Business Support, Delaware Economic Development Office (DEDO)
Cawel State Building, 820 French Street, Wilmington, DE, 19801
Phone: (302) 577-8496, Fax: (302) 577-8499, Email: Kenneth.R.Anderson@state.de.us*

Contact: Ken Anderson

Director, Entrepreneurial & Small Business Support, Delaware Economic Development Office (DEDO)

Cawel State Building, 820 French Street, Wilmington, DE, 19801

Phone: (302) 577-8496, Fax: (302) 577-8499, Email: Kenneth.R.Anderson@state.de.us