

## Production of jet fuel precursor monoterpenoids from engineered *Escherichia coli* - DTU Orbit (09/11/2017)

### Production of jet fuel precursor monoterpenoids from engineered *Escherichia coli*

Monoterpenes (C<sub>10</sub> isoprenoids) are the main components of essential oils and are possible precursors for many commodity chemicals and high energy density fuels. Monoterpenes are synthesized from geranyl diphosphate (GPP), which is also the precursor for the biosynthesis of farnesyl diphosphate (FPP). FPP biosynthesis diverts the carbon flux from monoterpene production to C<sub>15</sub> products and quinone biosynthesis. In this study, we tested a chromosomal mutation of *Escherichia coli*'s native FPP synthase (IspA) to improve GPP availability for the production of monoterpenes using a heterologous mevalonate pathway. Monoterpene production at high levels required not only optimization of GPP production but also a basal level of FPP to maintain growth. The optimized strains produced two jet fuel precursor monoterpenoids 1,8-cineole and linalool at the titer of 653mg/L and 505mg/L, respectively, in batch cultures with 1% glucose. The engineered strains developed in this work provide useful resources for the production of high-value monoterpenes.

### General information

State: Published

Organisations: Novo Nordisk Foundation Center for Biosustainability, Synthetic Biology Tools for Yeast, Joint Bioenergy Institute

Authors: Mendez-Perez, D. (Ekstern), Alonso-Gutierrez, J. (Ekstern), Hu, Q. (Ekstern), Molinas, M. (Ekstern), Baidoo, E. E. K. (Ekstern), Wang, G. (Ekstern), Chan, L. J. G. (Ekstern), Adams, P. D. (Ekstern), Petzold, C. J. (Ekstern), Keasling, J. D. (Intern), Lee, T. S. (Ekstern)

Pages: 1703-1712

Publication date: 2017

Main Research Area: Technical/natural sciences

### Publication information

Journal: Biotechnology and Bioengineering

Volume: 114

Issue number: 8

ISSN (Print): 0006-3592

Ratings:

BFI (2017): BFI-level 1

Web of Science (2017): Indexed yes

BFI (2016): BFI-level 1

Scopus rating (2016): CiteScore 4.14 SJR 1.411 SNIP 1.163

Web of Science (2016): Indexed yes

BFI (2015): BFI-level 1

Scopus rating (2015): SJR 1.613 SNIP 1.37 CiteScore 4.44

Web of Science (2015): Indexed yes

BFI (2014): BFI-level 1

Scopus rating (2014): SJR 1.589 SNIP 1.401 CiteScore 4.16

Web of Science (2014): Indexed yes

BFI (2013): BFI-level 2

Scopus rating (2013): SJR 1.621 SNIP 1.425 CiteScore 4.44

ISI indexed (2013): ISI indexed yes

Web of Science (2013): Indexed yes

BFI (2012): BFI-level 2

Scopus rating (2012): SJR 1.639 SNIP 1.366 CiteScore 4.04

ISI indexed (2012): ISI indexed yes

Web of Science (2012): Indexed yes

BFI (2011): BFI-level 2

Scopus rating (2011): SJR 1.668 SNIP 1.483 CiteScore 4.08

ISI indexed (2011): ISI indexed yes

Web of Science (2011): Indexed yes

BFI (2010): BFI-level 2

Scopus rating (2010): SJR 1.538 SNIP 1.357

Web of Science (2010): Indexed yes

BFI (2009): BFI-level 2

Scopus rating (2009): SJR 1.491 SNIP 1.356

Web of Science (2009): Indexed yes

BFI (2008): BFI-level 1

Scopus rating (2008): SJR 1.238 SNIP 1.288

Web of Science (2008): Indexed yes

Scopus rating (2007): SJR 1.368 SNIP 1.362

Web of Science (2007): Indexed yes

Scopus rating (2006): SJR 1.458 SNIP 1.43

Web of Science (2006): Indexed yes

Scopus rating (2005): SJR 1.123 SNIP 1.239

Web of Science (2005): Indexed yes

Scopus rating (2004): SJR 1.094 SNIP 1.249

Web of Science (2004): Indexed yes

Scopus rating (2003): SJR 1.041 SNIP 1.228

Web of Science (2003): Indexed yes

Scopus rating (2002): SJR 1.197 SNIP 1.278

Web of Science (2002): Indexed yes

Scopus rating (2001): SJR 1.07 SNIP 1.177

Web of Science (2001): Indexed yes

Scopus rating (2000): SJR 1.102 SNIP 1.541

Web of Science (2000): Indexed yes

Scopus rating (1999): SJR 1.511 SNIP 1.567

Original language: English

Monoterpenes, Jet fuel, Metabolic engineering, 1 ,8-cineole, Linalool, Mevalonate pathway

DOIs:

10.1002/bit.26296

Source: FindIt

Source-ID: 2355970616

Publication: Research - peer-review › Journal article – Annual report year: 2017