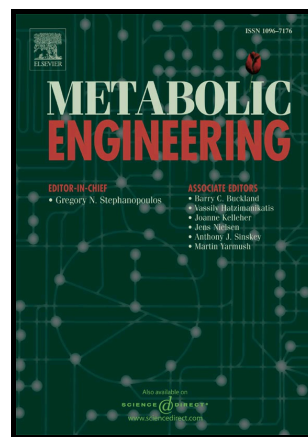


Author's Accepted Manuscript

Production of 2-methyl-1-butanol and 3-methyl-1-butanol in engineered *Corynebacterium glutamicum*

Michael Vogt, Christian Brüsseler, Jan van Ooyen, Michael Bott, Jan Marienhagen



www.elsevier.com/locate/ymben

PII: S1096-7176(16)30163-X
DOI: <http://dx.doi.org/10.1016/j.ymben.2016.10.007>
Reference: YMBEN1161

To appear in: *Metabolic Engineering*

Received date: 25 July 2016
Revised date: 11 October 2016
Accepted date: 12 October 2016

Cite this article as: Michael Vogt, Christian Brüsseler, Jan van Ooyen, Michael Bott and Jan Marienhagen, Production of 2-methyl-1-butanol and 3-methyl-1-butanol in engineered *Corynebacterium glutamicum*, *Metabolic Engineering* <http://dx.doi.org/10.1016/j.ymben.2016.10.007>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Production of 2-methyl-1-butanol and 3-methyl-1-butanol in engineered *Corynebacterium glutamicum*

Michael Vogt, Christian Brüsseler, Jan van Ooyen, Michael Bott, Jan Marienhagen*

Institute of Bio- and Geosciences, IBG-1: Biotechnology, Forschungszentrum Jülich, D-52425 Jülich, Germany

*Corresponding author. Dr. Jan Marienhagen, Tel.: +49 2461 61 2843, j.marienhagen@fz-juelich.de

Abstract

The pentanol isomers 2-methyl-1-butanol and 3-methyl-1-butanol represent commercially interesting alcohols due to their potential application as biofuels. For a sustainable microbial production of these compounds, *Corynebacterium glutamicum* was engineered for producing 2-methyl-1-butanol and 3-methyl-1-butanol via the Ehrlich pathway from 2-keto-3-methylvalerate and 2-ketoisocaproate, respectively. In addition to an already available 2-ketoisocaproate producer, a 2-keto-3-methylvalerate accumulating *C. glutamicum* strain was also constructed. For this purpose, we reduced the activity of the branched-chain amino acid transaminase in an available *C. glutamicum* L-isoleucine producer (K2P55) via a start codon exchange in the *ilvE* gene enabling accumulation of up to 3.67 g/l 2-keto-3-methylvalerate. Subsequently, nine strains expressing different gene combinations for three 2-keto acid decarboxylases and three alcohol dehydrogenases were constructed and characterized. The best strains accumulated 0.37 g/l 2-methyl-1-butanol and 2.76 g/l 3-methyl-1-butanol in defined medium within 48 h under oxygen deprivation conditions, making these strains ideal candidates for additional strain and process optimization.

Keywords: biofuels, *Corynebacterium glutamicum*, 2-keto acids, 2-methyl-1-butanol, 3-methyl-1-butanol, Ehrlich pathway

Download English Version:

<https://daneshyari.com/en/article/6494224>

Download Persian Version:

<https://daneshyari.com/article/6494224>

[Daneshyari.com](https://daneshyari.com)