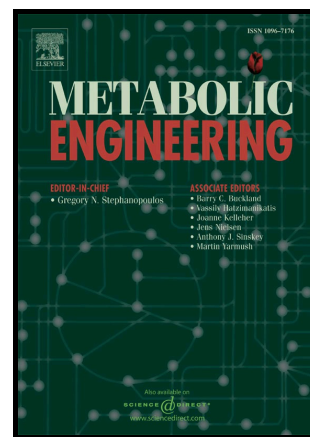


Author's Accepted Manuscript

Engineering a short, aldolase-based pathway for (R)-1,3-butanediol production in *Escherichia coli*

Kayla Nemr, Jonas E.N. Müller, Jeong Chan Joo, Pratih Gawand, Ruhi Choudhary, Burton Mendonca, Shuyi Lu, Xiuyan Yu, Alexander F. Yakunin, Radhakrishnan Mahadevan



www.elsevier.com/locate/ymben

PII: S1096-7176(17)30399-3
DOI: <https://doi.org/10.1016/j.ymben.2018.04.013>
Reference: YMBEN1388

To appear in: *Metabolic Engineering*

Received date: 27 October 2017
Revised date: 17 April 2018
Accepted date: 18 April 2018

Cite this article as: Kayla Nemr, Jonas E.N. Müller, Jeong Chan Joo, Pratih Gawand, Ruhi Choudhary, Burton Mendonca, Shuyi Lu, Xiuyan Yu, Alexander F. Yakunin and Radhakrishnan Mahadevan, Engineering a short, aldolase-based pathway for (R)-1,3-butanediol production in *Escherichia coli*, *Metabolic Engineering*, <https://doi.org/10.1016/j.ymben.2018.04.013>

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.

Engineering a short, aldolase-based pathway for (*R*)-1,3-butanediol production in *Escherichia coli*

Kayla Nemr^a, Jonas E. N. Müller,^{a,1} Jeong Chan Joo,^{a,2} Pratish
Gawand,^{a,1} Ruhi Choudhary^a, Burton Mendonca^a, Shuyi Lu^a, Xiuyan Yu^a,
Alexander F. Yakunin^a, Radhakrishnan Mahadevan,^{a,*}

^a*Department of Chemical Engineering and Applied Chemistry, University of Toronto,
200 College Street, Toronto, ON, M5S 3E5 Canada*

Abstract

Microbial processes can produce a wide range of compounds; however, producing complex and long chain hydrocarbons remains a challenge. Aldol condensation offers a direct route to synthesize these challenging chemistries and can be catalyzed by microbes using aldolases. Deoxyribose-5-phosphate aldolase (DERA) condenses aldehydes and/or ketones to β -hydroxyaldehydes, which can be further converted to value-added chemicals such as a precursor to cholesterol-lowering drugs. Here, we implement a short, aldolase-based pathway in *Escherichia coli* to produce (*R*)-1,3-BDO from glucose, an essential component of pharmaceutical products and cosmetics. First, we expressed a three step heterologous pathway from pyruvate to produce 0.3 g/L of (*R*)-1,3-BDO with a yield of 11.2 mg/g of glucose in wild-type *E.*

*Corresponding author, E-mail address: krishna.mahadevan@utoronto.ca

¹Current address: Ardra Bio Inc., 661 University Avenue suite 1300, Toronto, ON, M5G 0B7, Canada

²Current address: Centre for Bio-Based Chemistry, Division of Convergence Chemistry, Korea Research Institute of Chemical Technology, 141 Gajeong-ro, Yuseong-gu, Daejeon 34114, Republic of Korea

Download English Version:

<https://daneshyari.com/en/article/6494032>

Download Persian Version:

<https://daneshyari.com/article/6494032>

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