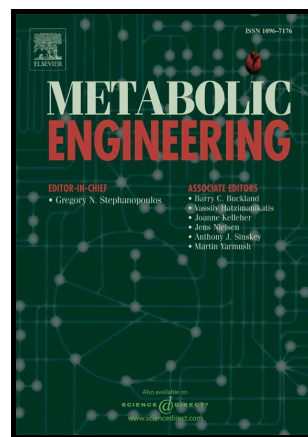


# Author's Accepted Manuscript

Balancing cellular redox metabolism in microbial electrosynthesis and electro fermentation – a chance for metabolic engineering

Frauke Kracke, Bin Lai, Shiqin Yu, Jens O. Krömer



[www.elsevier.com/locate/ymben](http://www.elsevier.com/locate/ymben)

PII: S1096-7176(17)30104-0  
DOI: <https://doi.org/10.1016/j.ymben.2017.12.003>  
Reference: YMBEN1328

To appear in: *Metabolic Engineering*

Received date: 3 April 2017  
Revised date: 15 September 2017  
Accepted date: 6 December 2017

Cite this article as: Frauke Kracke, Bin Lai, Shiqin Yu and Jens O. Krömer, Balancing cellular redox metabolism in microbial electrosynthesis and electro fermentation – a chance for metabolic engineering, *Metabolic Engineering*, <https://doi.org/10.1016/j.ymben.2017.12.003>

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.

# Balancing cellular redox metabolism in microbial electrosynthesis and electrofermentation – a chance for metabolic engineering

Frauke Kracke<sup>a</sup>, Bin Lai<sup>b,c,d</sup>, Shiqin Yu<sup>b,c</sup>, Jens O. Krömer<sup>d,§</sup>

<sup>a</sup> Department of Civil and Environmental Engineering, Stanford University, Stanford, 94305, CA, USA

<sup>b</sup> Centre for Microbial Electrochemical Systems (CEMES), The University of Queensland, St. Lucia, 4072, QLD, Australia

<sup>c</sup> Advanced Water Management Centre (AWMC), The University of Queensland, St. Lucia, 4072, QLD, Australia

<sup>d</sup> Systems Biotechnology group, Department of Solar Materials (SOMA), Helmholtz Centre for Environmental Research UFZ, Leipzig, Germany

<sup>§</sup> Corresponding author at: Jens O. Krömer (jens.kroemer@ufz.de).

## Abstract

More and more microbes are discovered that are capable of extracellular electron transfer, a process in which they use external electrodes as electron donors or acceptors for metabolic reactions. This feature can be used to overcome cellular redox limitations and thus optimising microbial production. The technologies, termed microbial electrosynthesis and electro-fermentation, have the potential to open novel bio-electro production platforms from sustainable energy and carbon sources. However, the performance of reported systems is currently limited by low electron transport rates between microbes and electrodes and our limited ability for targeted engineering of these systems due to remaining knowledge gaps about the underlying fundamental processes.

Download English Version:

<https://daneshyari.com/en/article/6494119>

Download Persian Version:

<https://daneshyari.com/article/6494119>

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