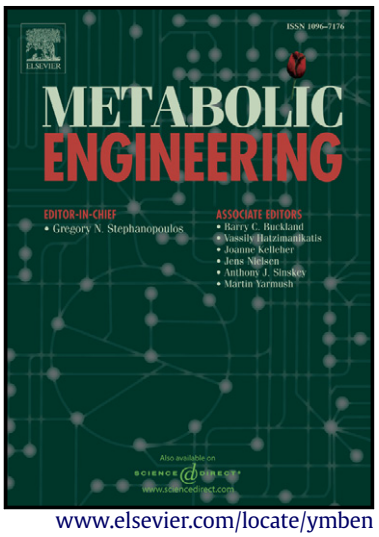

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PII: S1096-7176(14)00147-5
DOI: http://dx.doi.org/10.1016/j.ymben.2014.11.009
Reference: YMBEN943

To appear in: *Metabolic Engineering*

Received date: 16 August 2014
Revised date: 25 November 2014
Accepted date: 26 November 2014

Cite this article as: Anastasia Krivoruchko, Yiming Zhang, Verena Siewers, Yun Chen, Jens Nielsen, Microbial acetyl-CoA metabolism and metabolic engineering, *Metabolic Engineering*, http://dx.doi.org/10.1016/j.ymben.2014.11.009

Microbial Acetyl-CoA Metabolism and Metabolic Engineering

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Abstract

Recent concerns over the sustainability of petrochemical-based processes for production of desired chemicals have fueled research into alternative modes of production. Metabolic engineering of microbial cell factories such as *Saccharomyces cerevisiae* and *Escherichia coli* offers a sustainable and flexible alternative for the production of various molecules. Acetyl-CoA is a key molecule in microbial central carbon metabolism and is involved in a variety of cellular processes. In addition, it functions as a precursor for many molecules of biotechnological relevance. Therefore, much interest exists in engineering the metabolism around the acetyl-CoA pools in cells in order to increase product titers. Here we provide an overview of the acetyl-CoA metabolism in eukaryotic and prokaryotic microbes (with a focus on *S. cerevisiae* and *E. coli*), with an emphasis on reactions involved in the production and consumption of acetyl-CoA. In addition, we review various strategies that have been used to increase acetyl-CoA production in these microbes.

Key words: yeast, bacteria, acetyl-CoA, central carbon metabolism, industrial biotechnology