**Systems Metabolic Engineering for the Production of Aromatics in Yeast**

Nils JH Averesch1,3 and Jens O Krömer1,2

1 The University of Queensland, Brisbane, QLD 4072, Australia

2 Department Solar Materials, Helmholtz Centre of Environmental Research - UFZ, Leipzig, Germany

3 NASA, NASA Ames Research Center, Moffett Field, CA, USA

Aromatics are amongst the most important bulk feedstocks for the chemical industry, however, no viable bioprocess exists today and production is still dependent on petro-chemistry. In order to develop p-hydroxybenzoic acid (PHBA) and p-amino benzoic acid (PABA) production in *Saccharomyces cerevisiae* we employed *in-silico* analysis for the prediction of suitable targets for strain improvement of the shikimate pathway [1]. A key reaction in metabolism was the knockout of pyruvate kinase, which is known to be non-viable on glucose. In addition, the knockout of competing pathways led to very poor growth and auxotrophic strains. To address these problems we have engineered dynamic regulation using a synthetic quorum sensing circuit in *Saccharomyces cerevisiae* [2]. The circuit activates gene expression at a high population density, and is linked with an RNA interference (RNAi) module to enable targeted gene silencing. The circuit was used to control flux through the shikimate pathway for the production of PHBA. Following this, strain and media optimization lead to production in the g/L range [3,4]. This is a starting point for future process development.

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