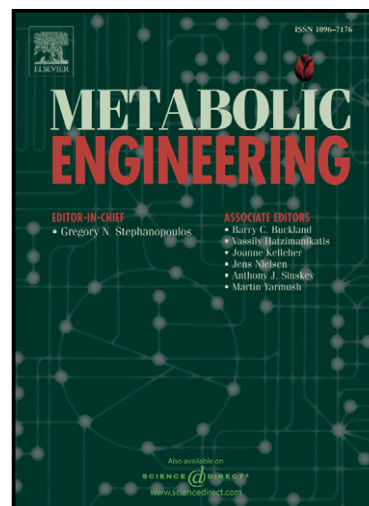


# Author's Accepted Manuscript

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PII: S1096-7176(15)00098-1  
DOI: <http://dx.doi.org/10.1016/j.ymben.2015.08.001>  
Reference: YMBEN1026

To appear in: *Metabolic Engineering*

Received date: 27 January 2015  
Revised date: 15 June 2015  
Accepted date: 3 August 2015

Cite this article as: Marja Ilmén, Merja Oja, Anne Huuskonen, Sangmin Lee, Laura Ruohonen, Simon Jung, Identification of novel isoprene synthases through genome mining and expression in *Escherichia coli*, *Metabolic Engineering*, <http://dx.doi.org/10.1016/j.ymben.2015.08.001>

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# Identification of Novel Isoprene Synthases through Genome Mining and Expression in *Escherichia coli*

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## Abstract

Isoprene is a naturally produced hydrocarbon emitted into the atmosphere by green plants. It is also a constituent of synthetic rubber and a potential biofuel. Microbial production of isoprene can become a sustainable alternative to the prevailing chemical production of isoprene from petroleum. In this work, sequence homology searches were conducted to find novel isoprene synthases. Candidate sequences were functionally expressed in *Escherichia coli* and the desired enzymes were identified based on an isoprene production assay. The activity of three enzymes was shown for the first time: expression of the candidate genes from *Ipomoea batatas*, *Mangifera indica*, and *Elaeocarpus photiniifolius* resulted in isoprene formation. The *Ipomoea batatas* isoprene synthase produced the highest amounts of isoprene in all experiments, exceeding the isoprene levels obtained by the previously known *Populus alba*

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