

Joshua K. Michener

1 Bethel Valley Road
Oak Ridge, TN, 37830

michenerjk@ornl.gov
(865) 576-7957

Education:

California Institute of Technology	Bioengineering	PhD	2012
Massachusetts Institute of Technology	Chemical Engineering	S.B.	2006
Massachusetts Institute of Technology	Biology	S.B.	2006

Research Experience:

2018-Present	Adjunct Professor, Bredesen Center, University of Tennessee
2018-Present	Staff Scientist, Biosciences Division, Oak Ridge National Laboratory
2015-2018	Wigner Fellow, Biosciences Division, Oak Ridge National Laboratory
2014-2015	NRSA Fellow, Biological Engineering, MIT
2012-2014	NRSA Fellow, Organismal and Evolutionary Biology, Harvard University

Publications: (*: Corresponding author)

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- Close D, Cooper SJ, Wang X, Giannone RJ, Engle NL, Tschaplinski TJ, Hedstrom L, Parks JM, and **Michener JK***, Horizontal transfer of a pathway for coumarate catabolism unexpectedly inhibits purine nucleotide biosynthesis. *In revision*. [Preprint](#).
- Cecil JH, Garcia DC, Giannone RJ, and **Michener JK***, Rapid, parallel identification of pathways for catabolism of lignin-derived aromatic compounds in *Novosphingobium aromaticivorans*. *In revision*. [Preprint](#).
- Standaert RF, Giannone RJ, and **Michener JK***. Identification of parallel and divergent optimization solutions for homologous metabolic enzymes. *Metab Eng Comm* 2018. 6:56-62. [Link](#).
- Clarkson SM, Giannone RJ, Kridelbaugh DM, Elkins JG, Guss AM*, and **Michener JK***, Construction and optimization of a heterologous pathway for protocatechuate catabolism in *Escherichia coli* enables bioconversion of model aromatic compounds. *Appl Env Microbiol* 2017 Aug 31;83(18). [Link](#).
- Michener JK***, Vuilleumier S, Bringel F, and Marx CJ. Transfer of a catabolic pathway for chloromethane in *Methylobacterium* strains highlights different limitations for growth with chloromethane or with dichloromethane. *Front Microbiol* 2016. [Link](#)
- Houser JR, Barnhart C, Boutz DR, Carroll SM, Dasgupta A, **Michener JK**, et al. Controlled measurement and comparative analysis of cellular components in *E. coli* reveals broad regulatory changes in response to glucose starvation. *PLoS Comput Biol* 2015; 11(8): e1004400. [Link](#)
- Michener JK**, Camargo Neves AAC, Vuilleumier S, Bringel F, and Marx CJ. Effective use of a horizontally-transferred pathway for dichloromethane catabolism requires post-transfer refinement. *eLife*. 2014;10.7554/eLife.04279 [Link](#).
- Michener JK**, Vuilleumier S, Bringel F, and Marx CJ. Phylogeny poorly predicts the utility of a challenging horizontally-transferred gene in *Methylobacterium* strains. *J Bacteriol.*, June

2014 196:2101-2107 [Link](#).

Michener JK and Smolke CD. Synthetic RNA switches for yeast metabolic engineering. *Methods in Molecular Biology, Yeast Metabolic Engineering*. 2012; 1152:125-36 [Link](#).

Michener JK, Nielsen J, and Smolke CD. Identification and treatment of heme depletion due to over-expression of a lineage of evolved P450 monooxygenases. *Proc Natl Acad Sci U S A*. 2012 Nov 20;109(47):19504-9. [Link](#).

Michener JK and Smolke CD. High-throughput enzyme evolution in *Saccharomyces cerevisiae* using a synthetic RNA switch. *Metabolic Engineering*. 2012 Jul; 14(4):306-16. [Link](#)

Michener JK, Thodey K, Liang JC, and Smolke CD. (2011) Applications of genetically-encoded biosensors for the construction and control of biosynthetic pathways. *Metabolic Engineering*. 2012 May; 14(3):212-22. [Link](#)

Advisees:

Gerald Presley (2018 – present) – Postdoc. PhD, University of Minnesota.

Julie Chaves (2018 – present) – Postdoc. PhD, University of California, Berkeley

Zach Schmitz (2018) – Undergraduate, MIT

Jacob Cecil (2017) – Undergraduate, University of Tennessee

Jessica Velez (2017) – PhD student, University of Tennessee

Danika Nimlos (2016) – Undergraduate, University of California, Berkeley

Aline Carmago-Neves (2014) – PhD student, University of São Paulo

Professional Affiliations:

American Institute of Chemical Engineers (AIChE)

International Metabolic Engineering Society (IMES)

American Society for Microbiology (ASM)

Awards:

DOE Distinguished Staff Fellowship (2015-2018)

NIH NRSA Postdoctoral Fellowship (2012-2015)

Nordic Research Fellowship (2011)

NSF Graduate Research Fellowship (2018-2011)

Roger de Friez Hunneman Prize (2006)

Phi Beta Kappa (2006)

Professional Service:

Session chair, AIChE Annual Meeting (2015, 2018)

iGEM Championship Judge (2012-2014, 2018)

Invited panelist, NSF workshop on “Creating a Research Agenda for the Ecological Implications of Synthetic Biology” (January 2014)

Invited panelist, Sloan Foundation workshop on “Governance Approaches for Synthetic Biology” (June 2014)