

# Joshua J. Hamilton

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## Employment History

- **Federation Bio, Inc.** South San Francisco, CA  
*Data Scientist* 2019-present
- **University of Wisconsin-Madison (UW-Madison)** Madison, WI  
*Postdoctoral Associate, Department of Biochemistry* 2018-2019
- **UW-Madison** Madison, WI  
*Postdoctoral Associate, Department of Bacteriology* 2014-2017

## Education and Academic Positions

- **UW-Madison** Madison, WI  
*Ph.D., Chemical Engineering* 2009-2014
- **Case Western Reserve University (CWRU)** Cleveland, OH  
*B.S., Chemical Engineering* 2005-2009

## Manuscripts

2. Clark RL, Connors B, Stevenson DM, Hromada SE, **Hamilton JJ**, Amador-Noguez D, and OS Venturelli. (2020) *Design of synthetic human gut microbiome assembly and function*. bioRxiv. doi:10.1101/10.1101/2020.08.19.241315.
1. Scarborough MJ, **Hamilton JJ**, Erb EA, Donohue TJ, and DR Noguera. (2020) *Diagnosing and predicting mixed culture fermentations with unicellular and guild-based metabolic models*. bioRxiv. doi:10.1101/759548.

## Publications

12. Cao X\*, **Hamilton JJ\***, and OS Venturelli. (2019) *Understanding and Engineering Distributed Biochemical Pathways in Microbial Communities*. Biochemistry. 58(2): 94-107. doi:10.1021/acs.biochem.8b01006.
11. Dwulit-Smith JR, **Hamilton JJ**, Stevenson DM, He S, Oyserman BO, Moya-Flores F, Amador-Noguez D, McMahon KD, and KT Forest. (2018) *acI Actinobacteria Assemble a Functional Actinorhodopsin with Natively-synthesized Retinal*. Applied and Environmental Microbiology. 84(24): e01678-18. doi:10.1128/AEM.01678-18.
10. Scarborough MJ, Lawson CE, **Hamilton JJ**, Donohue TJ, and DR Noguera. (2018) *Metatranscriptomic and Thermodynamic Insights into Medium-Chain Fatty Acid Production Using an Anaerobic Microbiome*. mSystems. 3(6): e00221-18. doi:10.1128/mSystems.00221-18.

9. Rohwer RR, **Hamilton JJ**, Newton, RJ, and KD McMahon. (2018) *TaxAss: Leveraging a Custom Freshwater Database Achieves Fine-Scale Taxonomic Resolution*. mSphere. 3(5): e00327-18. doi:10.1128/mSphere.00327-18.
8. Garcia SL, Buck M, **Hamilton JJ**, Wurzbacher C, Grossart HP, McMahon KD, and A Eiler. (2018) *Model Communities Hint at Promiscuous Metabolic Linkages between Ubiquitous Free-Living Freshwater Bacteria*. mSphere. 3(3): e00202-18. doi:10.1128/mSphere.00202-18.
7. **Hamilton JJ**, Garcia SL, Brown BS<sup>†</sup>, Oyserman BO, Moya F, Bertilsson S, Malmstrom RR, Forest KT, and KD McMahon. (2017) *Metabolic Network Analysis and Metatranscriptomics Reveals Auxotrophies and Nutrient Sources of the Cosmopolitan Freshwater Microbial Lineage acI*. mSystems. 2(4): e00091-17. doi:10.1128/mSystems.00091-17.
6. Lawson CE, Wu S, Bhattacharjee AS, **Hamilton JJ**, McMahon KD, Goel R, and DR Noguera. (2017) *Metabolic network analysis reveals microbial community interactions in anammox granules*. Nature Communications. 8: 15416. doi:10.1038/ncomms15416.
5. **Hamilton JJ**, Calixto Contreras M<sup>†</sup>, and JL Reed. (2015) *Thermodynamics and H<sub>2</sub> Transfer in a Methanogenic, Syntrophic Community*. PLoS Computational Biology. 11(7): e1004364. doi:10.1371/journal.pcbi.1004364.
4. Vinay-Lara E, **Hamilton JJ**, Stahl B, Broadbent JR, Reed JL, and JL Steele. (2014) *Genome-Scale Reconstruction of Metabolic Networks of Lactobacillus casei ATCC 334 and 12A*. PLoS ONE. 9(11): e110785. doi:10.1371/journal.pone.0110785.
3. **Hamilton JJ** and JL Reed. (2014) *Software platforms to facilitate reconstructing genome-scale metabolic networks*. Environmental Microbiology. 16(1): 49-59. doi:10.1111/1462-2920.12312.
2. **Hamilton JJ**, Dwivedi V<sup>†</sup>, and JL Reed. (2013) *Quantitative Assessment of Thermodynamic Constraints on the Solution Space of Genome-Scale Metabolic Models*. Biophysical Journal. 105(2): 512-522. doi:10.1016/j.bpj.2013.06.011.
1. **Hamilton JJ** and JL Reed. (2012) *Identification of Functional Differences in Metabolic Networks Using Comparative Genomics and Constraint-Based Models*. PLoS ONE. 7(4): e34670. doi:10.1371/journal.pone.0034670.

\* indicates equal contribution

† indicates an undergraduate student author

## Oral Presentations

7. **Hamilton JJ**, Garcia SL, Brown BS, Oyserman BO, Moya F, Bertilsson S, Malmstrom RR, Forest KT, and KD McMahon. *Microbial Ecosystems Biology: A Framework for Scaling from Genomes to Ecosystems*. Association of Environmental Engineering and Science Professors Research and Education Conference. Ann Arbor, MI, June 2017.
6. **Hamilton JJ**. *Diving Into Freshwater Microbial Genomes to Infer Bacterial Traits*. Wisconsin Ecology 22nd Annual Fall Symposium. Madison, WI, October 2016.
5. **Hamilton JJ** and JL Reed. *Thermodynamics and H<sub>2</sub> Transfer in a Methanogenic, Syntrophic Community*. COBRA 2014: 3rd Conference on Constraint-Based Reconstruction and Analysis, Charlottesville, VA, May 2014.

4. **Hamilton JJ** and JL Reed. *Identification of Functional Differences in Cyanobacterial Metabolic Networks Using Constraint-Based Models*. American Society of Microbiology (ASM) General Meeting, Denver, CO, May 2013.
3. **Hamilton JJ**, Dwivedi V, and JL Reed. *Thermodynamics-Based Flux-Balance Analysis: Incorporation of Thermodynamic and Metabolomic Data Into Genome-Scale Constraint-Based Models*. American Institute of Chemical Engineers Annual Meeting, Pittsburgh, PA, October 2012.
2. **Hamilton JJ** and JL Reed. *Comparison of Microbial Metabolic Networks to Guide Background Strain Selection*. American Chemical Society National Meeting, San Diego, CA, March 2012.
1. **Hamilton JJ** and JL Reed. *Genome Alignment and Pair-Wise Comparison of Microbial Metabolic Networks Identifies Novel Potential Drug Targets*. American Institute of Chemical Engineers Annual Meeting, Minneapolis, MN, October 2011.

## Poster Presentations

5. **Hamilton JJ**, Clark RL, Groblewski ES, and OS Venturelli. *A chemically-defined growth medium for a model human gut microbiome*. Madison Microbiome Meeting (M3), Madison, WI. April 2018.
4. **Hamilton JJ**, Garcia SL, Bendall ML, Brown BS, Stevens SLR, Bertilsson S, Forest KT, Malmstrom RR, Stepanauskas R, Tringe SG, Woyke T, and KD McMahon. *Metabolic Network Analysis and Metatranscriptomics of a Cosmopolitan and Streamlined Freshwater Lineage*. 16th International Symposium on Microbial Ecology, Montreal, Canada. August 2016.
3. **Hamilton JJ**, Bendall M, Glavina del Rio T, Bertilsson S, Malmstrom R, Stepanauskas R, Tringe S, Woyke T, and KD McMahon. *Ecological Niches of Freshwater Actinobacteria Revealed through Comparative Genomics and Reverse Ecology*. Gordon Research Conference on Applied and Environmental Microbiology, Mount Holyoke College, South Hadley, MA. July 2015.
2. **Hamilton JJ**, He S, Bendall M, Glavina del Rio T, Bertilsson S, Malmstrom R, Stepanauskas R, Tringe S, Woyke T, and KD McMahon. *Ecological Niches of Uncultivated Freshwater Phyla Revealed Through Comparative Genomics*. UMX: 10th Annual Department of Energy Joint Genome Institute User Meeting, Walnut Creek, CA. March 2015.
1. **Hamilton JJ** and JL Reed. *Thermodynamics and H<sub>2</sub> Transfer in a Methanogenic, Syntrophic Community*. COBRA 2014: 3rd Conference on Constraint-Based Reconstruction and Analysis, Charlottesville, VA. May 2014.

## Teaching Experience

- **Critical Analyses in Microbiology** UW-Madison  
Instructor Spring 2016
- **Environmental Microbiology** UW-Madison  
Guest Lecturer Spring 2015, Spring 2017

- **Computational Tools for Analyzing Microbial Metabolism** ASM General Meeting  
*Instructor* May 2013
- **Biochemical Engineering** UW-Madison  
*Guest Lecturer* Fall 2011, Fall 2012, Fall 2015
- **Biochemical Engineering** UW-Madison  
*Teaching Assistant* Fall 2011
- **Mass Transfer Operations** UW-Madison  
*Teaching Assistant* Spring 2011
- **Organic Chemistry** CWRU  
*Supplemental Instructor* Fall 2008
- **Chemistry of Materials** CWRU  
*Supplemental Instructor* Fall 2007, Spring 2008, Spring 2009

## Mentoring Experience

- **Emma S. Groblewski** UW-Madison  
*Undergraduate Student* Fall 2017 to present
- **Robin R. Rohwer** UW-Madison  
*Ph.D. Student* Fall 2015 to present
- **Christopher E. Lawson** UW-Madison  
*Ph.D. Student* Fall 2015 to present
- **Brittany S. Brown** UW-Madison  
*Undergraduate Student* Summer 2015
- **Montserrat Calixto Contreras** UW-Madison  
*Undergraduate Student* Fall 2013
- **Stan Anderson** UW-Madison  
*Undergraduate Student* Spring 2012
- **Vivek Dwivedi** UW-Madison  
*Undergraduate Student* Summer 2011
- **Emely Y. Medina Chapparo** UW-Madison  
*Undergraduate Student* Summer 2010