

## TRINITY L. HAMILTON

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Department of Biological Sciences  
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### PROFESSIONAL PREPARATION

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Montana State University	Ph.D.	Chemistry & Biochemistry	2012
Montana State University	B.S.	Chemistry & Biochemistry	2006
Montana State University	B.S.	Biology	2003

### APPOINTMENTS

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UNIVERSITY OF CINCINNATI  
Assistant Professor  
Department of Biological Sciences  
2015 - present

THE PENNSYLVANIA STATE UNIVERSITY  
NASA Astrobiology Institute Postdoctoral Fellow  
Department of Geosciences  
2012 - 2014

MAX PLANCK INSTITUTE FOR MARINE MICROBIOLOGY  
Visiting Scientist  
Microsensor Group  
2013

MONTANA STATE UNIVERSITY  
PhD Research Assistantship  
Department of Chemistry and Biochemistry  
*Defining the ecological interactions that drove the evolution of biological nitrogen fixation*  
2006 - 2012

### PUBLICATIONS

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#### 2015

Telling, J., Boyd, E.S., Bone, N., Jones, E., Tranter, M., J.L., MacFarlane, Martin, P., Wadham, J., LaMarche-Gagnon, G., Skidmore, M.L., **Hamilton, T.L.**, Hill, E., Jackson, M., Hodgson, D.A. (2015) Rock comminution as a source of hydrogen for subglacial ecosystems. *Accepted. Nature Geosciences.*

Mansor, M. **Hamilton, T.L.**, Fantle, M., Macalady, J.L. Metabolic diversity and ecological niches of *Achromatium* populations revealed with single-cell genomic sequencing. *Frontiers in Microbiology* **6**:822 (doi: 10.3389/fmicb.2015.00822)

Havig, J., McCormick, M.L., **Hamilton, T.L.**, Kump, L.R. (2015) The behavior of biologically important trace elements across the oxic/euxinic transition of meromictic Fayetteville Green Lake, New York, USA. *Geochimica et Cosmochimica Acta.* **165**:389-406. (doi: 10.1016/j.gca.2015.06.024)

**Hamilton, T.L.**, Jones, D.S., Schaperdoth, I., Macalady, J.L. (2015) Metagenomic insights into S(0) precipitation in a terrestrial subsurface lithoautotrophic ecosystem. *Frontiers in Microbiology* 5:756. (doi: 10.3389/fmicb.2014.00756)

Boyd, E.S., Garcia Costas, A.M., **Hamilton, T.L.**, Mus, F., Peters, J.W. (2015) Evolution of molybdenum nitrogenase during the transition from anaerobic to aerobic metabolism. *Journal of Bacteriology*. (doi: 10.1128/JB.02611-14)

Lincoln, S.A., **Hamilton, T.L.**, Juárez, A.G.V, Schedlerb, M., Macalady, J.L., Müller, R., Freeman, K.H. (2015) Draft genome sequence of the piezotolerant, crude oil-degrading bacterium *Rhodococcus qingshengii* strain TUHH-12. *GenomeA* 3:e00268-15. (doi: 10.1128/genomeA.00268-15)

## 2014

Boyd, E.S., **Hamilton T.L.**, Swanson, K.D., Howells, A.E., Baxter, B.K., Meuser, J.E., Posewitz, M.C., Peters, J.W. (2014). [FeFe]-Hydrogenase abundance and diversity along a vertical redox gradient in Great Salt Lake, USA. *International Journal of Molecular Sciences* 15: 21947-21966. (doi: 10.3390/ijms150x000x)

Thiel T., **Hamilton, T.L.**, Tomsho, L.P., Burbans, R., Gay, S.E., Ramaley, R.F., Schuster, S.C., Steinke, L.A., Bryant, D.A. (2014) Draft genome sequence of the moderately thermophilic bacterium *Schleiferia thermophila* strain Yellowstone (*Bacteroidetes*). *GenomeA* 2:4. (doi: 10.1128/genomeA.00860-14)

Thiel T., **Hamilton, T.L.**, Tomsho, L.P., Burbans, R., Gay, S.E., Schuster, S.C., Ward, D.M., Bryant, D.A. (2014) Draft genome sequence of the filamentous anoxygenic phototrophic bacterium *Chloroflexus* sp. strain MS-G (*Chloroflexi*). *GenomeA* 2:5. (doi: 10.1128/genomeA.00872-14)

Boyd, E.S., **Hamilton, T.L.**, Havig, J.R., Skidmore, M., Shock, E.S. (2014) Chemolithotrophic primary production in a subglacial ecosystem. *Applied and Environmental Microbiology*. 80: 6146-6132. (doi: 10.1128/AEM.01956-14)

**Hamilton, T.L.**, Bovee R.J., Thiel, V., Sattin S.R., Mohr, W., Schaperdoth, I., Vogl K., Gilhooly III, W.P., Lyons, T.W., Tomsho, L.P., Schuster, S.C., Overmann, J., Bryant D.A., Pearson, A., Macalady, J.L. (2014) Coupled reductive and oxidative sulfur cycling in the phototrophic plate of a meromictic lake. *Geobiology*. 12: 451-468. (doi: 10.1111/gbi.12092)

**Hamilton, T.L.**, Koonce, E., Howells, A., Havig, J.R., Jewell, T., de la Torre, J., Peters, J.W., Boyd, E.S. (2014) Competition for ammonia influences the structure of chemotrophic communities in geothermal springs. *Applied and Environmental Microbiology* 80: 653-661. (doi: 10.1128/AEM.02577-13)

## 2013

Macalady, J.L., **Hamilton, T.L.**, Grettenberger, C.L., Jones, D.S., Tsao, L.E., Burgos, W.D. (2013) Energy, ecology and the distribution of microbial life. *Philosophical Transactions of the Royal Society B* 368: 1622. (doi: 10.1098/rstb.2012.0383)

Boyd, E.S., **Hamilton, T.L.**, Wang, J., He, L., Zhang, C.L. (2013) The role of tetraether lipid composition in the adaptation of thermophilic archaea to acidity. *Frontiers in Terrestrial Microbiology* 4: 62. (doi: 10.3389/fmicb.2013.00062)

**Hamilton, T.L.**, Peters, J.W., Skidmore, M.L., Boyd, E.S. (2013) Molecular evidence for an active endogenous microbiome beneath glacial ice. *The ISME Journal* 7: 1402-1412. (doi: 10.1038/ismej.2013.31)

## 2012

Duffus, B.R., **Hamilton, T.L.**, Shepard, E., Boyd, E.S., Peters, J.W., Broderick, J. B. (2012) Radical AdoMet Enzymes in Complex Inorganic Metal Cluster Biosynthesis. *Biochimica et Biophysica Acta (BBA)-Proteins and Proteomics* 1824: 1254-1263. (doi: 10.1016/j.bbapap.2012.01.002)

## 2011

Peters, J.W., Boyd, E.S., and **Hamilton, T.L.**, Rubio, L. (2011) Chapter 4: Biochemistry of Mo-Nitrogenase. In *Nitrogen Cycling in Bacteria: Molecular Analysis*. Ed. J.W.B. Moir. Norfolk: Caister Academic Press. (ISBN: hisb978-1-904455-86-8)

Boyd, E.S., **Hamilton, T. L.**, Peters, J.W. (2011) An alternative path for the evolution of biological nitrogen fixation. *Frontiers in Microbiology* 2: 205. (doi: 10.3389/fmicb.2011.00205).

**Hamilton, T.L.**, Vogl, K., Bryant, D.A., Boyd, E.S., Peters, J.W. (2011) Environmental constraints define the distribution, composition, and evolution of chlorophototrophs in thermal features of Yellowstone National Park. *Geobiology* 10: 236-249. (doi: 10.1111/j.1472-4669.2011.00296.x)

**Hamilton, T.L.**, Jacobson, M., Ludwig, M., Boyd, E.S., Bryant, D.A., Dean, D.R., Peters, J.W. (2011) Differential accumulation of *nif* structural gene mRNA in *Azotobacter vinelandii*. *Journal of Bacteriology* 193: 4534-4536. (doi: 10.1128/JB.05100-11)

**Hamilton, T.L.**, Ludwig, M., Dixon, R., Boyd, E.S., Dos Santos, P., Setubal, J.C., Bryant, D.A., Dean, D.R., Peters, J.W. (2011) Transcriptional profiling of nitrogen fixation in *Azotobacter vinelandii*. *Journal of Bacteriology* 193: 4477-4486. (doi: 10.1128/JB.05099-11)\*\*\**Journal Highlight, Microbe, October, 2011*\*\*\*

Boyd, E.S., Lange, R.K., Mitchell, A.C., Havig, J.R., **Hamilton, T.L.**, Lafrenière, M.J., Shock, E.L., Peters, J.W., Skidmore, M. (2011). Diversity, abundance, and potential activity of nitrifying and denitrifying microbial assemblages in a subglacial ecosystem. *Applied and Environmental Microbiology* 77: 4778-4787. (doi: 10.1128/AEM.00376-11)

**Hamilton, T.L.**, Boyd, E.S., Lange, R.K., Peters, J.W. (2011) Biological nitrogen fixation in acidic high temperature geothermal springs in Yellowstone National Park, Wyoming. *Environmental Microbiology* 13: 2204-2215. (doi: 10.1111/j.1462-2920.2011.02475.x)

**Hamilton, T.L.**, Boyd, E.S., Peters, J.W. (2011) Environmental constraints underpin the phylogenetic diversity of *nifH* in the Yellowstone Geothermal Complex. *Microbial Ecology* 10: 236-249. (doi: 10.1007/s00248-011-9824-9)

Boyd, E.S., Anbar, A.D., Miller, S., **Hamilton, T.L.**, Lavin, M., Peters, J.W. (2011) A late methanogen origin for molybdenum-dependent nitrogenase. *Geobiology* 9: 221-232. (doi: 10.1111/j.1472-4669.2011.00278.x)

Boyd, J.M., Endrizzi, J.A., **Hamilton, T.L.**, Downs, D.M., Peters, J.W. (2011) FAD binding by ApbE protein from *Salmonella enterica*: a new class of FAD binding proteins. *Journal of Bacteriology* 193: 887-895. (doi: 10.1128/JB.00730-10)

## 2010

Boyd, E.S., **Hamilton, T.L.**, Spear, J.R., Lavin, M., Peters, J.W. (2010) [FeFe]-hydrogenase In Yellowstone National Park: Evidence for dispersal limitation and phylogenetic niche conservation. *The ISME Journal* 4: 887-895. (doi: 10.1038/ismej.2010.76)

## 2008

Sarma, R, Barney, B.M., **Hamilton, T.L.**, Jones, A., Seefeldt, L.C., Peters, J.W. (2008) Crystal structure of the L protein of *Rhodobacter sphaeroides* light-independent protochlorophyllide reductase with MgADP bound: a homologue of the nitrogenase Fe protein. *Biochemistry* 47: 13004-13015. (doi: 10.1021/bi801058r)

## 2007

Taylor, R.M., Maaty, W.S., Lord, C.I., **Hamilton, T.**, Burritt, J.B., Bothner, B., Jesaitis, A.J. (2007) Cloning, sequence analysis and confirmation of derived gene sequences for three epitope-mapped monoclonal antibodies against human phagocyte flavocytochrome b. *Molecular Immunology* 44: 625-637. (doi: 10.1016/j.molimm.2005.10.022)

## INVITED SEMINARS

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University of Kentucky, Department of Biology, November 2015

The Pennsylvania State University, Ecology Program, April 2015

University of Cincinnati, Department of Biological Sciences, February 2014

Colorado School of Mines, Department of Chemistry and Geochemistry, December 2013

## PUBLISHED ABSTRACTS

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**Hamilton T.L.\***, Klatt, J. M., Bird, L.M., Freeman, K.H., de Beer, D., Macalady, J.L. (2014) A Metabolically Versatile Cyanobacterium and the Low-Oxygen Proterozoic World. *Mineralogical Magazine*, 77(5), 902.

**Hamilton, T.L.\***, Bird, LM, Freeman, KH, Macalady, JL (2013) 2-Methyl Hopanoid Production and Anoxygenic Photosynthesis: A Model Early Earth Cyanobacteria Isolated from a Proterozoic Ocean Analog. *Mineralogical Magazine*, 77(5) 1249.

## RESEARCH FIELD SITES

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Yellowstone National Park, WY, USA

Green Lake, Fayetteville, NY, USA

Little Salt Spring, North Port, FL

Robertson Glacier, Alberta, Canada

Cascade Range, Pacific Northwest, USA

Beartooth Pass, MT, USA

Daniel Boone National Forest, KY, USA

## GRANTS AND AWARDS

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2013 - present NASA Astrobiology Institute Postdoctoral Fellow 2013

2013 - 5th International Conference on Polar and Alpine Microbiology travel grant \$1200

2013 - ASM Career Development Grant for Postdoctoral Women \$1200

2012 - Women in Science and Engineering Travel Grant \$500

2012 - Montana Institute on Ecosystems Graduate Fellow-Spring \$2000

2011 - Poster award winner, Thermophiles

2011 - Journal Highlights of Microbe

2011 - Poster award winner, Origins 2011

2011 - NAI Summer School Scholar, Santander, Spain

2011 - Invited Speaker, Gordon Research Seminar, Bioinorganic Chemistry

2010 - Timothy Swager Travel Grant 2010 \$1000  
2008 - NSF IGERT Fellowship \$30000/year, 2 year appointment  
2008 - MT INBRE Travel Award 2008 \$500  
2005 - MT INBRE Summer Undergraduate Award 2005 \$4500  
2004 - MT INBRE Undergraduate Research Program \$750 per semester, 2 year appointment

### **PROFESSIONAL ASSOCIATIONS**

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American Geophysical Union (AGU)  
American Society for Microbiology (ASM)  
Ecological Society of America (ESA)

### **TEACHING ASSISTANT/LECTURES**

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Penn State University

Geosc 598 - Metagenomics Seminar  
Geosc 021 - Earth & Life  
Abiol 590 - Astrobiology Seminar

Montana State University

LRES 557 - Thermal Biology in Yellowstone National Park  
BIOL 591 - Examining Life in Extreme Environments  
Anatomy and Physiology, General Chemistry I and II, Introduction to Astrobiology

### **SYNERGISTIC ACTIVITIES**

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AbSciCon co-convenor - AbSciCon 2015 "Phototrophic Life and Earth's Redox Evolution"  
Session co-convenor - Goldschmidt 2014 "From Genes to Geochemistry"  
Goldschmidt student workshop panel speaker - Goldschmidt 2014 "What's life got to do with it: Integrating Microbiology and Geochemistry"  
Session co-convenor - Goldschmidt 2013 "Phototrophic Life and Earth's Redox Evolution"  
AbGradCon 2011 co-organizer

### **EDUCATION AND PUBLIC OUTREACH**

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Pennsylvania State University - Shake, Rattle, and Rocks  
Montana State University - MSU Science Zone  
Montana State University - Women in Science

### **EDITORIAL SERVICE**

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Review Editor, *Frontiers in Extreme Microbiology*, 2014-present  
Guest Editor, *Life*, Special Topic in "Origin and Evolution of Photosynthesis", 2015

### **PEER REVIEW**

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*NASA, NASA EPSCoR, Ohio Water Resources, Scientific Reports, PNAS, Applied and Environmental Microbiology, PLOS ONE, Frontiers in Microbiology, Chemical Geology, FEMS Microbiology, Journal of Applied Microbiology, Marine Environmental Research, Astrobiology, Microbial Ecology, International Journal of Astrobiology*

### **PROFESSIONAL CONTACTS**

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Pennsylvania State University  
State College, PA 16802  
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jlm80@psu.edu

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103 CBB  
Montana State University  
Bozeman, Montana 59717  
Tel: 406-994-7213  
john.peters@chemistry.montana.edu

Dr. Eric S. Boyd  
631A Leon Johnson  
Montana State University  
Bozeman, Montana 59717  
Tel: 406-994-7046  
eboyd@montana.edu