Benjamin D. Peterson

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Education

University of Wisconsin - Madison Madison, WI
PhD candidate in Environmental Chemistry and Technology Program, current
Department of Civil and Environmental Engineering

State University of New York at Geneseo Geneseo, NY
Bachelor of Science, *summa cum laude* Biochemistry 2012
Honors Minor (Edgar Fellows Honors Program)

Employment and Research Experience

Graduate Research Assistant 2015-current
McMahon Lab – Departments of Bacteriology and Civil & Environmental Engineering
Ecophysiology of mercury-methylating organisms in freshwater ecosystems

- Dissertation project focuses on combining meta-omics techniques with functional assays and biogeochemical measurements to understand how microbes link biogeochemical cycling to the production of toxic methylmercury in freshwater ecosystems
- Serve as microbial ecology specialist on two large-scale U.S. Geology Survey projects studying mercury cycling in impacted sites (Hells Canyon Reservoir in Idaho and the Florida Everglades)
- Maintain the North Temperate Lakes Microbial Observatory time series

Animal Biologist (Contracter with Kelly's Government Services) 2014-2015
National Institute on Aging: Neuroplasticity and Behavior Unit PI: Dr. Henriette van Praag
Impacts of running on initial integration of adult-born hippocampal neurons

- Designed and led a study to characterize initial integration of new adult-born neurons into hippocampal networks
- Used fluorescent proteins delivered by injection of modified viruses into hippocampus to trace developing neural networks with two-photon microscopy
- Maintained experimental mouse colony

Postbaccalaureate IRTA Research Fellow 2012-2014
National Institute on Aging: Neuroplasticity and Behavior Unit PI: Dr. Henriette van Praag
Tracing impacts of exercise on neuronal integration of adult-born hippocampal neurons

- Performed stereotaxic surgeries, perfusions, and immunohistochemical staining
- Used two-photon microscope to analyze tracings and expression of neurotransmitter receptors and chloride transporters
- Conducted animal behavior experiments
- Developed protocol to trace initial stages of neuronal integration by adult-born hippocampal cells

Undergraduate Research Assistant 2009-2012
State University of New York at Geneseo: Biology Department PI: Dr. George Briggs
Characterization of a Novel Specifier Protein in the Glucosinolate-Myrosinase Pathway in Brassica rapa

- Identified novel protein in the glucosinolate-myrosinase pathway in *B. rapa* and cloned it into E. coli for characterization
- Designed a gas chromatography/mass spectroscopy protocol to identify the effect of the putative specifier protein on the products of the glucosinolate-myrosinase pathway
- Analyzed isothiocyanate production of B. rapa under conditions of stress

Summer Undergraduate Research Assistant Summer 2011
University of Buffalo: Department of Biological Sciences PI: Dr. Denise Ferkey
Impact of G-protein coupled signaling receptors on chemosensation of quinine in C. elegans

- Used behavioral assays to identify TRPV channel necessary for chemosensation of quinine
- Used SNP mapping to identify location of TRPV channel gene

Peer-reviewed publications

* indicates co-first authorship
** indicates undergraduate student I mentored

1. Mohammad, H., Marchisella, F., Ortega-Martinez, S., Hollos, P., Eerola, K., Komulainen, E., Kulesskaya, N., Freemantle, E., Fagerholm, V., Savontous, E., Rauvala, H., **Peterson, B.D.**, van Praag, H., Coffey, E.T., 2018. "JNK1 controls adult hippocampal neurogenesis and imposes cell-autonomous control of anxiety behaviour from the neurogenic niche." Mol Psychiatry 23, 362–374. https://doi.org/10.1038/mp.2016.203
2. Sah, N., ***Peterson, B.D.**, Lubejko, S.T., Vivar, C., van Praag, H., 2017. "Running reorganizes the circuitry of one-week-old adult-born hippocampal neurons." Sci Rep 7, 10903. https://doi.org/10.1038/s41598-017-11268-z
3. Vivar, C., **Peterson, B.D.**, van Praag, H., 2016. "Running rewires the neuronal network of adult-born dentate granule cells." NeuroImage 131, 29–41. https://doi.org/10.1016/j.neuroimage.2015.11.031

Pre-prints and submissions

1. **Peterson, B.D.**, McDaniel, E.A., Schmidt, A.G., Lepak, R.F., Tran, P.Q., Marick, R.A., Ogorek, J.M., DeWild, J.F., Krabbenhoft, D.P., McMahon, K.D., 2020. "Mercury methylation trait dispersed across diverse anaerobic microbial guilds in a eutrophic sulfate-enriched lake". bioRxiv. https://doi.org/10.1101/2020.04.01.018762
2. McDaniel, E.A., **Peterson, B.D.**, Stevens, S.L.R., Tran, P.Q., Anantharaman, K., McMahon, K.D., 2020. "Expanded Phylogenetic Diversity and Metabolic Flexibility of Microbial Mercury Methylation". bioRxiv. https://doi.org/10.1101/2020.01.16.909358 *Submitted*

Oral presentations

Invited talks

1. Identification of Mercury Methylating Organisms along a Trophic Gradient. **Greater Everglades Ecosystem Restoration Conference**. Coral Springs, Florida. *April 2019*

Contributed talks

1. Novel hgcA+ organisms dominate mercury-methylating community in water column of sulfate-enriched lake. **International Conference on Mercury as a Global Pollutant**. Krakow, Poland. *September 2020*
2. Mercury-methylating organisms in Lake Mendota. **American Water Resources Association Wisconsin Section Annual Meeting**. Delavan, WI. *March 2019*

Internal Seminars

1. Identification and activity of mercury-methylating microbes in Lake Mendota. **NTL-LTER Early Career Scientist Meeting**, University of Wisconsin - Madison. *April 2020*
2. Identification and activity of mercury-methylating microbes in Lake Mendota. **Environmental Chemistry and Technology Seminar**, University of Wisconsin - Madison. *March 2020*
3. Mercury-methylating organisms in Lake Mendota. **Environmental Chemistry and Technology Seminar**, University of Wisconsin - Madison. *April 2019*
4. Mercury-methylating organisms in Lake Mendota. **Center for Limnology Weekly Seminar**. University of Wisconsin - Madison. *May 2019*
5. Distribution of mercury-methylating microbes along spatial and temporal redox gradients in a freshwater lake. **Environmental Chemistry and Technology Seminar**, University of Wisconsin - Madison. *April 2018*
6. Meta-omics, microbes, and freshwater biogeochemistry! Oh My! **Environmental Chemistry and Technology Seminar**, University of Wisconsin - Madison. *April 2017*

Poster Presentations

1. Distribution of mercury-methylating microbes along spatial and temporal redox gradients in a freshwater lake. **International Society for Microbial Ecology Conference**. Leipzig, Germany. *August 2018*
2. Distribution of mercury-methylating microbes along spatial and temporal redox gradients in a freshwater lake. **SETAC Young Environmental Scientist Meeting**. University of Wisconsin - Madison. *March 2018*
3. Distribution of mercury-methylating microbes along spatial and temporal redox gradients in a freshwater lake. **International Conference on Mercury as a Global Pollutant**. Providence, RI. *July 2017*
4. Spatial distribution of ultramicrobacteria along Lake Erie. **IAGLR's Conference on Great Lakes Research**. Detroit, MI. *May 2017*
5. Vertical distribution of microbial communities during late stratification in a eutrophic, dimictic lake. **International Society for Microbial Ecology Conference**. Montreal, Canada *September 2016*

Teaching and Mentoring

ComBEE presentations

Undergraduate Mentor in McMahon Lab 2015-present
- Anna Grace Schmidt:
- North Temperate Lakes Microbial Observatory Team: Led team, including 7 undergraduates, in maintaining 20+ year time series.

Organic Chemistry Tutor and Grader 2010-2012
Chemistry Department, SUNY-Geneseo

Service

Water at UW grad rep

Organizer, SETAC YES meeting

Postbac IRTA Representative 2013-2015
National Institute on Aging

Geneseo Presidential Scholar 2011-2012
State University of New York at Geneseo

Grants

Honors

NSF GRFP	2016
Anna Grant Birge Memorial Scholarships	2016, 2017
Becker Travel Award	2016
Phi Beta Kappa	2012
Ulmer-Jackson Biochemistry Award	2012
Goldwater Scholar	2011
CRC Award to the Best Overall Student in Introductory Chemistry	2009
Geneseo Dean's List	7 semesters