

Elizabeth McDaniel
Microbiology PhD Student
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Education

University of Wisconsin – Madison

Aug. 2016-present

Ph.D. candidate in the Microbiology Doctoral Training Program

- Laboratory of Dr. Katherine McMahon, Departments of Bacteriology and Civil and Environmental Engineering

University of Arkansas – Fayetteville

Aug. 2012-May 2016

Bachelor of Science in Biology with Statistics Minor, Cum Laude Honors

- GPA: 3.71/4.0
- Honors Thesis: Natural Variation of the Ena1p Sodium Pump in *S. cerevisiae*

Research Experience

Graduate Research Assistant

Jan. 2017 - present

McMahon Lab – Departments of Bacteriology and Civil & Environmental Engineering, University of Wisconsin – Madison, Madison WI

- Main dissertation project studying bacterial communities of engineered wastewater systems using a combination of genome-resolved metagenomics approaches and enrichment culture techniques
- Developing computational workflows and approaches for high-throughput assembly and analysis of freshwater lake metagenomes
- Lab data and systems administrator for storing large-scale metagenomic data and associated metadata

Undergraduate Research Assistant

Aug. 2013-Aug. 2016

Lewis Lab – Department of Biological Sciences, University of Arkansas, Fayetteville, AR

- Studied the natural variation of stress defense mechanisms in the budding yeast *Saccharomyces cerevisiae*, specifically salt stress
- Developed a protocol for creating transposon deletion libraries in wild strains of *S. cerevisiae*

Summer Undergraduate Research Intern

May-Aug. 2014

Broach Lab – Department of Biochemistry and Molecular Biology, Penn State Hershey, Hershey, PA

- Studied the interactions and movements of chromosomes during quiescence in the budding yeast *S. cerevisiae* using fluorescence microscopy

Peer-Reviewed Publications

1. McDaniel E.A., Stuecker T.N., Veluvolu M., Gasch A.P., Lewis J.A. Independent Mechanisms for Acquired Salt Tolerance versus Growth Resumption Induced by Mild Ethanol Pretreatment in *Saccharomyces cerevisiae*. mSphere. Editor's Pick. Nov 2018, 3 (6) e0057418; DOI: 10.1128/mSphere.00574-18

Preprints and Submissions

2. McDaniel E.A., Peterson B., Stevens S.L.R., Tran P.Q., Anantharaman K., McMahon K.D.. Expanded Phylogenetic Diversity and Metabolic Flexibility of Microbial Mercury Methylation. Jan. 2020. bioRxiv. DOI: 10.1101/2020.01.16.909358

1. McDaniel E.A., Anantharaman, K., McMahon K.D. metabolisHMM: Phylogenomic analysis for exploration of microbial phylogenies and metabolic pathways. Dec. 2019. bioRxiv. DOI: 10.1101/2019.12.20.884627. Submitted.

Oral Presentations

Invited Talks and Plenary Sessions

5. Examining Long-Term Microbial Population Dynamics At Multiple Scales Using Enrichment Bioreactors As Model Ecosystems. **Microbial Ecology and Water Engineering (MEWE) conference**. Hiroshima, Japan. Nov. 2019.
4. Expanded Phylogenetic Diversity and Metabolic Flexibility of Microbial Mercury Methylation. Evolution Series Seminar. **University of Wisconsin – Madison JF Crow Institute for the Study of Evolution**. Sept. 2019.
3. Integrating Anvi'o Tools into your Workflow: Insights from a Biological Nutrient Removal (BNR) System. **Resolving Microbial Communities at Strain-Level Symposium**. Penryn, UK. Aug. 2018.
2. Natural Variation in Yeast Uncovers Novel Regulation of the Ena1p Sodium Pump. **Southeastern Regional Yeast Meeting**. Tuscaloosa, AL. March 2016.
1. Natural Variation in Yeast Uncovers Novel Regulation of the Ena1p Sodium Pump. **Southeastern Regional Yeast Meeting**. Little Rock, AR. March 2015.

Internal Seminars

4. Characterizing Ecological Roles and Interactions of '*Candidatus Accumulibacter phosphatis*' in Wastewater Systems. **Microbiology Doctoral Training Program Seminar**. University of Wisconsin – Madison. Apr. 2020
3. "Best" Practices in Metagenomic Binning and Annotation. **Computational Biology, Ecology, and Evolution (ComBEE) 'Omics Study Group session**. University of Wisconsin – Madison. ComBEE 'Omics Study Group Session. Dec. 2019.
2. Eco-systems biology of a Microbial Community Performing Enhanced Biological Phosphorus Removal. **Microbiology Doctoral Training Program Seminar**. University of Wisconsin – Madison. Nov. 2018.
1. Bacterial Communities of Lab-Scale Wastewater Enrichments. **UW-Madison Bioscience Opportunities Preview Weekend Lightning Talk**. Sept. 2018.

Poster Presentations

11. ComBEE: Computational Biology, Ecology, and Evolution: Enhancing computational literacy in the life sciences through peer-led study groups. **UW-Madison Data Science Hub Data Science Research Bazaar and Wisconsin Institute for Discovery "Illuminating Discovery" events**. Jan. & Feb. 2020. (Poster constructed and presented on behalf of ComBEE Team)
10. Microbiomes of Freshwater Lakes and Engineered Wastewater Systems. **Water @ UW Symposium**. Madison, WI. Oct. 2018. (Poster constructed and presented on behalf of McMahon Lab)
9. Expanded Phylogenetic and Metabolic Diversity of Microbial Mercury Methylation. **Department of Bacteriology Raper Symposium**. Madison, WI. Sept. 2018.
8. Comparative Genomics of Microbial Mercury Methylation. **International Society of Microbial Ecology Meeting**. Leipzig, Germany. Aug. 2018.
7. Long-Term Population Dynamics of '*Candidatus Accumulibacter phosphatis*' in Enhanced Biological Phosphorus Removal Sequencing-Batch Reactors. **Population, Evolutionary, Quantitative Genetics Conference**. Madison, WI. May 2018.
6. Comparative Genomics of Microbial Methylmercury Production. **Madison Microbiome Meeting**. Madison, WI. April 2018.
5. Comparative Genomics of Microbial Methylmercury Production. **Joint Genome Institute User Meeting: Genomics of Energy and Environment**. San Francisco, CA. Mar. 2018

4. Natural Variation in Yeast Uncovers Novel Regulation of the Ena1p Sodium Pump. **Arkansas IDeA Network of Biomedical Research Excellence Meeting**. Fayetteville, AR. Nov. 2015
3. Natural Variation in Yeast Uncovers Novel Regulation of the Ena1p Sodium Pump. **27th International Conference on Yeast Genetics and Molecular Biology**. Levico, Terme, Trentino, Italy. Sept. 2015
2. Natural Variation in Yeast Uncovers Novel Regulation of the Ena1p Sodium Pump. **South Central Branch of the American Society for Microbiology Joint Meeting**. Fayetteville, AR. Sept. 2014
1. Chromosome Interactions in Quiescent Yeast. **Penn State Hershey Summer Undergraduate Research Internship Programs Symposium**. Hershey, PA. Aug. 2014.

Honors and Awards

Civil and Environmental Engineering Becker Travel Supplement Award - \$500	Nov. 2019
O.N. Allen Soil and Environmental Microbiology Small Grants Award - \$3,290	Aug. 2019
Department of Bacteriology Betley-Allen Fellowship Award	May 2019
University of Wisconsin-Madison Student Travel Grant - \$600	April 2019
Microbiology Doctoral Training Program Travel Award - \$1000	May 2018
Department of Bacteriology Travel Award - \$1000	May 2018
Southeastern Regional Yeast Meeting Travel Award - \$250	Mar. 2016
University of Arkansas Honors College Research Grant - \$1200	Jan. 2016
University of Arkansas Honors College Travel Grant - \$1200	Aug. 2015
Southeastern Regional Yeast Meeting Travel Award - \$250	Mar. 2015
University of Arkansas Honors College Research Grant - \$2500	Jan. 2015
University of Arkansas Academic Scholarship - \$2500	2014-2015
ASM South Central Branch Meeting 2 nd Place Poster Award	Sept. 2014
University of Arkansas Academic Scholarship - \$1000	2013-2014
University of Arkansas Symphony Orchestra Scholarship - \$1000	2012-2016
University of Arkansas New Arkansan Non-Resident Tuition Award - \$39,040	2012-2016

Teaching, Mentoring, and Service

Bioinformatics Workshops (Teaching Assistant/Instructor/Course Development)

Certified Carpentries Instructor as of June 2019

Carpentries Mini-Workshops: Git/Github Pages; <i>Instructor and Developer</i>	April 2020
Research Bazaar Software Carpentry Workshop; <i>Helper</i>	Jan. 2020
Carpentries Genomics Introduction to R; <i>Instructor</i>	Aug. 2019
Data Carpentry Workshop Introduction to R; <i>Instructor</i>	June 2019
Software Carpentry Workshop; <i>Helper</i>	June 2019
Microbiome & Data Science Hubs Git/Github Pages Workshop; <i>Instructor and Developer</i>	Mar. 2019
Resolving Microbial Communities at Strain-Level Resolution Symposium; <i>Teaching Assistant</i>	Aug. 2018
ComBEE Git/Github Pages Workshop; <i>Instructor and Developer</i>	Sept. 2017
ComBEE Anvi'o Workshop; <i>Teaching Assistant</i>	May 2017
ComBEE Git Workshop; <i>Teaching Assistant</i>	Mar. 2017
ComBEE R Study Group Introduction to R; <i>Instructor and Developer</i>	Sp. 2017

Computational Biology, Ecology, and Evolution (ComBEE) Study Group Co-Chair Jan. 2017-present

ComBEE is a peer-led group for computational biology researchers on the UW-Madison campus. We hold study groups on the R and python programming languages, current topics in genomics, and host seminars from graduate students, postdocs, and professors on topics broadly ranging in ecology and evolution. Website at combe-uw-madison.github.io.

McMahon Lab Mentoring

2017-present

Graduate Student Mentor for Undergraduate Students, Research Experience Undergraduate Interns (REUs), and Masters Students carrying out independent projects and/or routine maintenance and sampling

- *Kaela Amundson*: Characterization and Enrichment of Microorganisms Capable of Extracellular Electron Transfer. *Undergraduate Mentee* Fa. 2017-Sp. 2018.
- *Matthew Wollf*: Metagenomics of Freshwater Lake and Engineered Wastewater Microbial Communities. *Undergraduate Mentee* Sp.-Fa. 2018
- *Kali Denis*: Time-Series Analysis of Under-Ice Freshwater Bacterial Communities. *Undergraduate Mentee* Sp. 2018.
- *EBPR Team*: Mentored to date **6 undergraduate** students performing routine maintenance and sampling of lab-scale bioreactors simulating Enhanced Biological Phosphorus Removal (EBPR). Additionally mentored **2 masters** students through their thesis projects on EBPR.

UW-Madison Metagenomics Workshop Development Team	<i>Sp. 2019 - present</i>
Ad-hoc Journal Reviewer: <i>Nature Microbiology</i>, <i>ISMEJ</i>, <i>mSystems</i>	<i>Fa. 2017-present</i>
Topics in Biotechnology Guest Lecturer on Wastewater Microbial Ecology	<i>Sp. 2020</i>
Microbiology 551: Senior Capstone Guest Lecturer on 16S Workflows and Bioinformatics	<i>Sp. 2020</i>
MEWE Multi-Omics Methods for Water Engineering Workshop Developer and Assistant	<i>Nov. 2019</i>
Microbiology Doctoral Training Program Admissions Committee	<i>Fa. 2019</i>
Data Science Hub Research Bazaar Planning Committee	<i>Fa. 2019</i>
Microbiology 304: Biology of Microorganisms Laboratory Teaching Assistant	<i>Sp. 2018</i>
BIOL 2323: General Genetics Drill Instructor	<i>Sp. 2015</i>
University of Arkansas Office of Admissions Ambassador	<i>Aug. 2013-Dec. 2015</i>

Professional Development and Society Memberships

Association for the Sciences of Limnology and Oceanography	<i>2020-current</i>
International Society of Microbial Ecology	<i>2018-current</i>
Genetics Society of America	<i>2018-current</i>
DELTA Research Mentor Training	<i>Summer 2019</i>
Carpentries Instructor Training	<i>April 2019</i>
IMG Microbial Genomics and Metagenomics Workshop, FISABIO	<i>June 2017</i>
Anvi'o Workshop, University of Chicago	<i>April 2017</i>
Data Carpentry Workshop, University of Wisconsin-Madison	<i>Jan. 2017</i>