

**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*

- Dissertation project investigating 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*

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

## Peer-Reviewed Publications

**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.** *mSystems*. In Press. Preprint available on *bioRxiv* DOI: 10.1101/2020.01.16.909358

**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

**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. **Mercury methylation traits dispersed across diverse anaerobic microbial guilds in a eutrophic sulfate-enriched lake.** April 2020. *bioRxiv*. DOI: 10.1101/2020.04.01.018762

## Datasets, Software, and Teaching Resources (non-peer reviewed)

2. **McDaniel E.A.** elizabethmcd/R-amplicons: Analyzing 16S Amplicon Data in R Course (Version v1.0). Zenodo. July 2020. <http://doi.org/10.5281/zenodo.3942709>. Course website at <http://elizabethmcd.github.io/R-amplicons/>.

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.

## **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**

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.

### **Virtual Seminars and Plenary Sessions**

2. Characterizing Ecological Roles and Interactions of ‘*Candidatus Accumulibacter phosphatis*’ in Wastewater Systems. **MicroSeminar**. August 2020.

1. Applying Genome-Resolved Metagenomics to Elucidate the Microbial “Black Box” in Model Wisconsin Lakes. **Incorporating Data Science and Open Science Techniques in Limnology and Oceanography Virtual Summit**. July 2020. Recording available at <https://bit.ly/2BAOSGC>

## **Poster Presentations**

7. ComBEE: Computational Biology, Ecology, and Evolution: Enhancing computational literacy in the life sciences through peer-led study groups. Presented at **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)

6. Microbiomes of Freshwater Lakes and Engineered Wastewater Systems. **Water @ UW Symposium**. Madison, WI. Oct. 2018. (Poster constructed and presented on behalf of McMahon Lab)

5. Expanded Phylogenetic and Metabolic Diversity of Microbial Mercury Methylation. Presented at **International Society of Microbial Ecology Meeting**. Leipzig, Germany. *Aug. 2018.*, and **Department of Bacteriology Raper Symposium**. Madison, WI. *Sept. 2018.*
4. 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.*
3. Comparative Genomics of Microbial Methylmercury Production. Presented at **Joint Genome Institute User Meeting: Genomics of Energy and Environment**. San Francisco, CA. *Mar. 2018*, and **Madison Microbiome Meeting**. Madison, WI. *April 2018.*
2. Natural Variation in Yeast Uncovers Novel Regulation of the Ena1p Sodium Pump. Presented at **South Central Branch of the American Society for Microbiology Joint Meeting**. Fayetteville, AR. *Sept. 2014*, **27<sup>th</sup> International Conference on Yeast Genetics and Molecular Biology**. Levico, Terme, Trentino, Italy. *Sept. 2015*, **Arkansas IDeA Network of Biomedical Research Excellence Meeting**. Fayetteville, AR. *Nov. 2015.*
1. Chromosome Interactions in Quiescent Yeast. **Penn State Hershey Summer Undergraduate Research Internship Programs Symposium**. Hershey, PA. *Aug. 2014.*

### Honors and Awards

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

### Teaching, Mentoring, and Service

#### **Bioinformatics Workshops (Helper/Teaching Assistant/Instructor/Course Development)**

##### ***Certified Carpentries Instructor as of June 2019***

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

**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](http://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 Wolff*: 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.

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

### Professional Development

**Google Career Readiness Data Analyst Challenge** Summer 2020  
 - *Google Cloud Essentials Quest Badge*  
 - *From Data to Insights with Google Cloud Platform Specialization*

**DELTA Research Mentor Training** Summer 2019  
**Carpentries Instructor Training and Certification** April 2019  
**IMG Microbial Genomics and Metagenomics Workshop, FISABIO** June 2017  
**Anvi'o Workshop, University of Chicago** April 2017  
**Data Carpentry Workshop, University of Wisconsin-Madison** Jan. 2017