

**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 on bacterial communities of engineered wastewater systems using a combination of genome-resolved metagenomics approaches and enrichment culture techniques
- Developed 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 *S. cerevisiae*
- 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 of chromosomes during quiescence in the budding yeast *S. cerevisiae* using fluorescence microscopy

## Peer-Reviewed Publications

**3. 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 genes identified across diverse anaerobic microbial guilds in a eutrophic sulfate-enriched lake. *Environmental Science and Technology*. Nov. 2020. DOI: 10.1021/acs.est.0c05435**

**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 Mercury-Methylating Microorganisms. *mSystems*. Aug 2020, 5 (4) e00299-20; DOI: 10.1128/mSystems.00299-20**

**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

**\* denotes equal contribution**

**1. McDaniel E.A.\*, Moya-Flores F.\*, Keene Beach N., Camejo P.Y., Oyserman B.O., Kizaric M., Khor E.H.,**

Noguera D.N., McMahon K.D. **Metabolic differentiation of co-occurring *Accumulibacter* clades revealed through genome-resolved metatranscriptomics.** *bioRxiv*. Nov. 2020. DOI: 10.1101/2020.11.23.394700

### Software, Teaching Resources, and Editorials (Non-Peer-Reviewed)

**2. McDaniel E.A. Analyzing 16S Amplicon Data in R Course** (version 1.0). July 2020. DOI: 10.5281/zenodo.3942708. 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

**4. Characterizing Ecological Roles and Interactions of '*Candidatus Accumulibacter phosphatis*' in Engineered Bioreactors. Microbiology Doctoral Training Program.** University of Wisconsin – Madison. Sept. 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.

#### Virtual Seminars and Plenary Sessions

**2. Characterizing Ecological Roles and Interactions of '*Candidatus Accumulibacter phosphatis*' in Wastewater Systems. MicroSeminar.** August 2020. Recording available at <https://bit.ly/2Q5NCzb>

**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 Unlocks 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 Mini-Software Carpentry Docker Workshop; <i>Helper</i>	<i>Dec. 2020</i>
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>	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](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.
- *William Dunn*: Ecophysiology of the Actinobacterial class *Thermoleophilia*. Fa. 2020-current
- *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.

**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

**Ad-hoc Journal Reviewer: *Nature Microbiology* (3), *ISMEJ* (1), *mSystems* (1), *Env Micro* (1)** 2017-present

**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