**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*

* Investigated 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.** 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

**1. 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. *Under Review.*

**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.*

**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 2nd 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 (Helper/Teaching Assistant/Instructor/Course Development)**

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

Virtual Software Carpentry Workshop; *Helper August 2020*

Amplicon Analysis in R Workshop; *Instructor and Developer* *April 2020*

Virtual Software Carpentry Mini-Workshop; *Helper* *April 2020*

Research Bazaar Software Carpentry Workshop; *Helper* *Jan. 2020*

Carpentries Genomics Introduction to R; *Instructor* *Aug. 2019*

Data Carpentry Workshop Introduction to R; *Instructor* *June 2019*

Software Carpentry Workshop; *Helper* *June 2019*

Microbiome & Data Science Hubs Git/Github Pages Workshop; *Instructor and Developer* *Mar. 2019*

Resolving Microbial Communities at Strain-Level Resolution Symposium; *Teaching Assistant Aug. 2018*

ComBEE Git/Github Pages Workshop; *Instructor and Developer* *Sept. 2017*

ComBEE Anvi’o Workshop; *Teaching Assistant* *May 2017*

ComBEE Git Workshop; *Teaching Assistant*  *Mar. 2017*

ComBEE R Study Group Introduction to R; *Instructor and Developer* *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 combee-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*

**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*

**Laboratory and Computational Skills**

**Laboratory Skills:** PCR Amplification and Cloning | Quantitative PCR | Flow Cytometry | Enrichment Culture Techniques and Bioreactor Operation | HPLC Analyte Analysis

**Computational Skills:** Bash/Unix | R/RStudio | Python | Git/Github | High-Throughput Computing (HT-Condor) | 16S Sequencing Preprocessing and Analysis | Metagenomic Assembly, Mapping, Binning, and Quality Assessment | Genome-Resolved Metatranscriptomics | Comparative Genomics (Anvi’o) | Google Cloud Platform | SQL and BigQuery