Elizabeth McDaniel

Microbiology PhD Student

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Education

University of Wisconsin – Madison *Aug. 2016-present*

Ph.D. student 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

McMahon Lab – University of Wisconsin – Madison *Jan. 2017 - present*

Graduate research assistant in the laboratory of Dr. Katherine McMahon investigating bacterial communities of engineered wastewater systems. I use a combination of genome-resolved metagenomics approaches and enrichment culture techniques to probe the diversity, functional activity, and population dynamics of microorganisms that perform phosphorus removal.

Lewis Lab – University of Arkansas – Fayetteville *Aug. 2013-Aug. 2016*

Undergraduate research assistant in the laboratory of Dr. Jeffrey Lewis studying the natural variation of stress defense mechanisms in the budding yeast *Saccharomyces cerevisiae.*

Broach Lab – Penn State Hershey College of Medicine *May-Aug. 2014*

Intern in the Summer Undergraduate Research Internship Program in the laboratory of Dr. James Broach studying the interactions and movements of chromosomes during quiescence in the budding yeast *S. cerevisiae.*

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) e00574-18; **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.*

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. McDaniel, E.A., Moya, F.M., van Steenbrugge, J., Oyserman, B.O., McMahon, K.D. 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. McDaniel, E.A., Peterson, B., Tran, P., Anantharaman, K., Krabbenhofft, D., McMahon, K.D. 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. McDaniel, E.A., Moya, F., Camejo, P., He, S., McMahon, K.D. 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. McDaniel, E.A., Stuecker, T.N., Elkon, I.M., Gasch, A.P., Lewis, J.A. Natural Variation in Yeast Uncovers Novel Regulation of the Ena1p Sodium Pump. **Southeastern Regional Yeast Meeting**. Tuscaloosa, AL. *March 2016.*

1. McDaniel, E.A. Stuecker, T.N., Elkon, I.M., Gasch, A.P., Lewis, J.A. Natural Variation in Yeast Uncovers Novel Regulation of the Ena1p Sodium Pump. **Southeastern Regional Yeast Meeting**. Little Rock, AR. *March 2015.*

Internal Seminars

3. McDaniel, E.A. "Best" Practices in Metagenomic Binning and Annotation. **Computational Biology, Ecology, and Evolution (ComBEE) 'Omics Study Group session**. University of Wisconsin – Madison. *Dec. 2019.*

2. McDaniel, E.A., van Steenbrugge, J., Oyserman, B.O, Moya, F., McMahon K.D. Eco-systems biology of a Microbial Community Performing Enhanced Biological Phosphorus Removal. **Microbiology Doctoral Training Program Seminar**. University of Wisconsin – Madison. *Nov. 2018.*

1. McDaniel, E.A., McMahon, K.D. Bacterial Communities of Lab-Scale Wastewater Enrichments. **UW-Madison Bioscience Opportunities Preview Weekend Lightning Talk**. *Sept. 2018.*

Poster Presentations

11. McDaniel, E.A. 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" event. *Jan. & Feb. 2020*. (Poster constructed and presented on behalf of ComBEE Team)

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

9. McDaniel, E.A., Peterson, B. Stevens, S.L.R., Krabbenhoft, D., McMahon, K.D. Expanded Phylogenetic and Metabolic Diversity of Microbial Mercury Methylation. Department of Bacteriology Raper Symposium. Madison, WI. *Sept. 2018.*

8. McDaniel, E.A.**,** Peterson, B. Stevens, S.L.R., Krabbenhoft, D., McMahon, K.D. Comparative Genomics of Microbial Mercury Methylation. International Society of Microbial Ecology Meeting. Leipzig, Germany. *Aug. 2018.*

7. McDaniel, E.A., Moya, F. Camejo, P. He, S. McMahon, K.D. 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. McDaniel, E.A., Peterson, B. Stevens, S.L.R., Krabbenhoft, D., McMahon, K.D. Comparative Genomics of Microbial Methylmercury Production. Madison Microbiome Meeting. Madison, WI. *April 2018.*

5. McDaniel, E.A., Peterson, B. Stevens, S.L.R., Krabbenhoft, D., McMahon, K.D. Comparative Genomics of Microbial Methylmercury Production. Joint Genome Institute User Meeting: Genomics of Energy and Environment. San Francisco, CA. *Mar. 2018*

4. McDaniel, E.A., Stuecker, T.N., Elkon, I.M., Gasch, A.P., Lewis, J.A. 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. McDaniel, E.A.**,** Stuecker, T.N., Elkon, I.M., Gasch, A.P., Lewis, J.A. 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. McDaniel, E.A.**,** Stuecker, T.N., Elkon, I.M., Gasch, A.P., Lewis, J.A. 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. McDaniel, E.A. Rutledge, M.T., Broach, J.R. 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 *November 2019*
O.N. Allen Soil and Environmental Microbiology Small Grants Award - $3,290 *August 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 (Teaching Assistant/Instructor/Course Development)
Certified Carpentries Instructor as of June 2019

Genome-Resolved Metagenomics Binning Workshop Instructor and Developer *April 2020*
Introduction to Github Pages Carpentries Workshop Instructor and Developer *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 *March 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 *March 2017*
ComBEE R Study Group Instructor and Developer *Spring 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 Summer REUs and Undergraduate Research Students
- Kaela Amundson: Characterization and Enrichment of Microorganisms Capable of External Electron Transfer. *Fa. 2017-Sp. 2018. Currently pursuing a Ph.D. in Microbiology at Colorado State University*
- Matthew Wollf: Metagenomics of Freshwater Lake and Engineered Wastewater Microbial Communities. *Fa, Sp. 2018*
- Kali Denis: Time-Series Analysis of Under-Ice Freshwater Bacterial Communities. *Sp. 2018.*
- EBPR Reactor Maintenance Team: Oversaw **6** undergraduate students and **2** masters students for maintenance of lab-scale wastewater bioreactors. *Fall 2018-current.*

UW-Madison Metagenomics Workshop Development Team *Sp. 2019 - present*
Topics in Biotechnology Guest Lecturer *Sp. 2020*
Microbiology 551 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 *Fall 2019*
Data Science Hub Research Bazaar Planning Committee *Fall 2019*
Microbiology 304: Biology of Microorganisms Laboratory TA *Spring 2018*
BIOL 2323: General Genetics Drill Instructor *Spring 2015*
University of Arkansas Office of Admissions Ambassador *Aug. 2013-Dec. 2015*
Ad-hoc* Journal Reviewer: *Nature Microbiology, ISMEJ, mSystems *Fa. 2017-present*

Professional Development

DELTA Research Mentor Training *Summer 2019*
Carpentries Instructor Training *April 2019*
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*

Technical Skills

Laboratory Skills:
DNA Extraction, PCR Amplification, qPCR, RNA Extraction, Primer Construction, Cloning, HPLC Chemical Analysis, Enrichment Lab-Scale Bioreactor Operation
Computational Skills:
Languages and Platforms: R/RStudio, python, bash, Unix, High-Throughput Computing (HT-Condor), Docker
Reproducible Research Skills: Command-line pipelines/packages in R and python, workflow managers, git/Github
Bioinformatics and (Meta)Genomics: Genome Assembly (short Illumina reads, long PacBio reads, and hybrid approaches), Functional Annotation and Metabolic Reconstruction, Mapping and Alignment, Variant Calling and Filtering, Metagenomic Binning and Quality Filtering, Genome-Resolved Metatranscriptomics, Comparative Genomics and Phylogenomics Platforms (KBase, anvi'o, iTOL, etc.), 16S Amplicon Analysis