Erin Ostrem, Ph.D.

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EDUCATION

Postdoctoral Fellow, Biochemistry, University of Wisconsin-Madison	2018-present
Ph.D., Molecular and Environmental Toxicology, University of Wisconsin-Madison	2013-2018
Post baccalaureate coursework, Environmental Science, University of Washington	2012-2013
BA, Communication Studies, University of Iowa	2005-2008

RESEARCH

Laboratory of Ophelia Venturelli — University of Wisconsin-Madison
Postdoctoral researcher — September 2018-present

Investigating the ecological interactions of a synthetic gut community to create probiotic and prebiotic therapies for human health

- Identification of generalizable ecological principles of microbial interactions in response to dietary fibers
- Designing community and fiber combinations to enhance butyrate production
- Implementation of Next Generation Sequencing, high throughput experimental methods, use of a Tecan liquid handling robot, high performance liquid chromatography, and computational modeling (i.e., interpretable ecological models, and machine learning)

Laboratory of Jae-Hyuk Yu — University of Wisconsin-Madison
Graduate Research Assistant — September 2013-August 2018

Thesis Title: Metabolism of Benzo(a)pyrene by Aspergillus sp. and the Implications for Human Health
Advisor: Professor Jae-Hyuk Yu
Committee: Professor Christina Remucal, Professor Garrett Suen, Professor Joel Pedersen, Professor Christopher Bradfield

- Investigation of *in vivo* mechanisms of BaP degradation by gene deletion, complementation, over-expression of fungal cytochrome p450s
- Implementation of RNA sequencing to identify transcriptional regulators, and biochemical processes necessary for degradation of BaP
- Quantification of degradation and degradation products by HPLC and LC-MS

National Center for Voice and Speech — Iowa City, Iowa
Laryngeal Molecular and Cell Biology Lab — October 2004- May 2005
Research Assistant

Characterized a novel vocal fold cell type to determine role in pathology and wound healing

- Utilized cell culture and adhesion assays to determine affinity towards various extracellular matrix components
- Visualized cellular adhesion and morphology using fluorescence microscopy

AWARDS

Genomic Sciences Training Program (GSTP) Post-Doctoral Trainee 2021
"Mapping gut microbial interaction networks in order to understand the impact of dietary fiber structure on community dynamics"

EPA Students To Achieve Results (STAR) Fellowship 2016
"Synthetic Fungal Biology for Human and Environmental Health through Enhanced Degradation of Benzo a)pyrene"

- Highly competitive award for doctoral students engaging in environmental research
- 4% award rate

PEER REVIEWED PUBLICATIONS

Erin Ostrem, Matthew F. Warren, Gabriel Contreras, Hailey Bussan, Mallikarjun Jillella, Jessamine Kuehn, Ruben Aquino Martinez, Eugenio Vivas, Federico Rey, Ophelia S. Venturelli**.** Dietary Fiber and Host-Derived Glycans Shape Butyrate Production through Modulation of Interspecies Interactions. *Will be available on BioRxiv 11/25/2024*.

Banka, N., **Erin M. Ostrem**, Ophelia S. Venturelli, Romero, P. ML-aided engineering of BmoR for butyrate detection. *Manuscript in progress*.

Nick Quinn-Bohmann, Tomasz Wilmanski, Katherine Ramos Sarmiento, Lisa Levy, Johanna W. Lampe, Thomas Gurry, Noa Rappaport, **Erin M. Ostrem**, Ophelia S. Venturelli, Christian Diener, Sean M. Gibbons. Microbial community-scale metabolic modeling predicts personalized short chain fatty acid production profiles in the human gut. *Nature Microbiology* 9, 1700–1712 (2024)

Ostrem Loss, EM, Thompson, J., Cheung, K. P., Qian, Y. & Venturelli, O. S. Carbohydrate complexity limits microbial growth and reduces the sensitivity of human gut communities to perturbations. *Nature Ecology and Evolution*, Nat Ecol Evol 7, 127–142 (2023).

Ostrem Loss EM Lee MK, Wu MY, Martien J, Chen W , Amador-Noguez D, Jefcoate C, Remucal C, Jung SH, Kim SC & Yu JH. (2019). Cytochrome P450 Monooxygenase-Mediated Metabolic Utilization of Benzo[a]Pyrene by Aspergillus Species. *mBio*. 10, e00558-19

Ostrem Loss EM and Yu J. (2018), Bioremediation and microbial metabolism of benzo(a)pyrene. *Molecular Microbiology*, 109: 433-444.

Wu M-Y, Mead ME, Lee M-K, **Ostrem Loss EM**, Kim S-C, Rokas A, Yu J-H. (2018). Systematic dissection of the evolutionarily conserved WetA developmental regulator across a genus of filamentous fungi. *mBio* 9:e01130-18.

Fuja, Tannin J., **Ostrem, Erin M**., Probst-Fuja, Megan N., Titze, Ingo R. "Differential Cell Adhesion to Vocal Fold Extracellular Matrix Constituents." *Matrix Biology* 25 (2006) 240-251

PRESENTATIONS

Erin Ostrem Loss (2022) *Using metabolic niches to design human gut communities with predictable responses to environmental perturbations.* NHGRI Research Training and Career Development meeting, April 3, 2022, Salt Lake City, Utah

Erin Ostrem Loss (2022) *Fiber Complexity Shapes the Dynamics and Response of Synthetic Human Gut Communities to Perturbations.* Genomic Sciences Training Program seminar, February 24, 2022, Madison, WI

Erin Ostrem Loss (2018) *Metabolism of benzo(a)pyrene by Aspergillus sp. and the implications for human health.* Fungal Supergroup seminar, September 20, 2018, Madison, WI

Erin Ostrem Loss (2017) *Regulation of the benzo(a)pyrene metabolizing CYP in Aspergillus nidulans relies on recognition of important environmental stimuli.* Molecular and Environmental Toxicology Center program seminar, September 14, 2017, Madison, WI

Erin Ostrem Loss (2016) *Understanding the Degradation of Benzo(a)pyrene by Aspergillus sp.:The Good, the Bad, and the Ugly.* Molecular and Environmental Toxicology Center program seminar, November 3, 2016, Madison, WI

Erin Ostrem and Ahmed Alshannaq (2015) *Enhancement of Food Safety Through Biological Elimination of Toxic Carcinogens.* UW-Madison Food Research Institute annual meeting. May 20, 2015, Madison, WI

Erin Ostrem. (2015) *NIH Grant Writing.* Molecular and Environmental Toxicology grant writing seminar. May 1, 2015 Madison, WI

Erin Ostrem (2014) *Cytochrome p450 Mediated Degradation of Benzo(a)pyrene by Aspergillus sp.* Molecular and Environmental Toxicology Center program seminar, November 13, 2014, Madison, WI

Erin Ostrem and Tannin Fuja. (2005). *Vocal Fold Stellate Cells: A novel cell type*. National Center for Voice and Speech. May 16, 2005. Iowa City, IA

TEACHING AND MENTORING

Teaching Assistant, M&Envtox 631: Toxicants in the Environment, Spring 2015
Course is designed to teach fate and transport of contaminants in the environment through various modeling techniques

- Responsible for preparation and grading of weekly homework and discussion section materials
- Held weekly discussion section and office hours for individual questions and concerns

Undergraduate Mentorship

Gabriel Miranda	2023	Independent research credit
Kevin Cheung	2019	Biochemistry independent research credit
Katherine Satori	2019	Biochemistry Scholars Program
Katie Maegli	2017	Independent research credit
Nicholas Bell	2017	Independent research credit
Julia Martien	2015	Food Research Institute Summer Internship
Melanie De La Rosa	2015	Universidad del Este Internship

David Schargorodsky	2014	Integrated Biological Sciences Summer Research Program
Ethan Boynton	2014	Madison Metropolitan School Distract High School Science Research

EMPLOYMENT HISTORY

Washington Conservation Corps Olympia, Washington
WA State Department of Ecology October 2009-September 2010
Restoration Crew Member
Participation in restoration of riparian habitats, including education in land management, and active surveying of restoration projects

VOLUNTEERISM

AmeriCorps National Service Participant Olympia, Washington
Washington Conservation Corps October 2009-September 2010

REFERENCES

Ophelia Venturelli, Assistant Professor of Biochemistry, UW-Madison, 3204C HF DeLuca Biochemical Sciences Building, 440 Henry Mall, Madison, WI 53706, venturelli@wisc.edu

Federico Rey, Associate Professor of Bacteriology, 5157 Microbial Sciences Building, 1550 Linden Dr., Madison, WI, 53706, ferey@wisc.edu

Jae-Hyuk Yu, Professor of Bacteriology, UW-Madison, 3155 Microbial Sciences Building,1550 Linden Dr., Madison, WI, 53706, jyu1@wisc.edu

Christina Remucal, Associate Professor of Civil and Environmental Engineering, UW-Madison, 141 Water Science & Engineering Laboratory, Madison, WI, 53706, remucal@wisc.edu