

**Erin Margaret Nawrocki**  
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## Education

2018      **Ph.D. in Microbiology**, University of Wisconsin-Madison

*Dissertation:* Mechanisms underlying the transfer of plasmid-borne botulinum neurotoxins in Group I *C. botulinum*

2013      **B.S. in Biology**, *summa cum laude*, Allegheny College

*Thesis:* Formation and structure of biofilms in wildtype and mutant *Haemophilus ducreyi*  
*Minor:* American Studies

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## Research Experience

2023-      **Staff Scientist**, University of Pittsburgh (PI: Vaughn S. Cooper)

- Managed laboratory tasks including routine sequencing of pathogens from clinical samples
- Developed high-throughput molecular barcoding tools for studying bacterial evolution

2019-2023    **Postdoctoral Fellow**, Pennsylvania State University (PI: Edward G. Dudley)

- Characterized the production and regulation of an antimicrobial peptide that increases Shiga toxin expression in enterohemorrhagic *E. coli*
- Contributed to GenomeTrakr, a national network for surveillance of foodborne pathogens, by performing whole genome sequencing of bacterial isolates
- Analyzed adherence of *E. coli* to primary bovine cells to address persistence and colonization in the animal reservoir

2013-2018    **Graduate Student**, University of Wisconsin-Madison (PI: Eric A. Johnson)

- Demonstrated that plasmid-encoded botulinum neurotoxin could be transferred between phylogenetically distant strains of *Clostridium* and expressed in transconjugants
- Maintained appropriate clearances to research *C. botulinum* and its neurotoxins through the Federal Select Agent Program

2010-2013    **Undergraduate Research Fellow**, Allegheny College (PI: Tricia L. Humphreys)

- Optimized assays for investigating biofilm formation in *H. ducreyi*, a fastidious organism that causes the genital ulcer disease chancroid
- Determined the susceptibility of *H. ducreyi* and *Lactobacillus* to the natural product resveratrol
- Received funded fellowships from Allegheny College, the American Society for Microbiology, and the National Science Foundation (REU in Prokaryotic Biology at the University of Georgia)

**Support**

2021-2023 **Agriculture and Food Research Initiative Postdoctoral Fellowship**, \$165,000

*Funding Agency:* USDA NIFA

*Role:* Project Director

*Title:* "Identifying bacterial factors involved in bovine colonization: a comparative genomics approach to adherence in Shiga toxin-producing *E. coli*"

*Award Number:* 2021-67034-35120

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**Teaching Experience**

2019-2023 **Guest Lecturer**, Pennsylvania State University

*Course:* Food Microbiology

- Prepared instructional materials and delivered lectures on foodborne clostridia

2015-2017 **Microbiology Teaching Fellow**, University of Wisconsin-Madison

*Course:* Current Topics in Microbiology

- Developed and implemented a "teachable unit" that included lecture materials, homework assessments, and discussion questions
- Led weekly discussions of primary literature articles with classes of 16 students
- Served as instructor of record and evaluated all student work

*Course:* General Microbiology Laboratory

- Gave introductory lectures and demonstrated laboratory techniques to sections of 30-40 undergraduates
- Graded problem sets, reports, and exams and shared responsibility for writing assessments

2011-2013 **Undergraduate Teaching Assistant**, Allegheny College

*Course:* Investigative Approaches in Biology

- Aided students in designing and interpreting experiments and editing laboratory reports
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**Mentoring Experience**

2019-2023 **USDA Research Experience & Extension for Undergraduates**

- Participated in an annual departmental summer program hosting 10-20 students from small colleges and the University of Puerto Rico
- Trained all students in proper laboratory methods and supervised 3-4 students' research projects each year

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## Publications

### Peer-Reviewed Articles

Soku YK, Dessai U, Walls I, Catherine R, Berutti T, Nieves-Miranda SM, **Nawrocki EM**, Fu Y, Mamber S, Dudley EG, Hicks J, Beck BH, Fortenberry G, Bentum K, Samuel T, Mohamed A. 2023. A comparative study on antimicrobial resistance in *Escherichia coli* isolated from channel catfish and Siluriformes products. [In revision, *Journal of Food Protection*.]

Rivera-Diaz J, Phillippi H, Mbogo N, **Nawrocki EM**, Dudley EG. 2022. Comparison of genotypic and phenotypic predictions for heavy metal resistance in *Salmonella enterica* and *Escherichia coli*. *American Journal of Undergraduate Research* 19(3):3-15.

Fu Y, M'ikanatha NM, Lorch JM, Blehert DS, Berlowski-Zier B, Whitehouse CA, Li S, Deng X, Smith JC, Shariat NW, **Nawrocki EM**, Dudley EG. 2022. *Salmonella enterica* serovar Typhimurium from wild birds in the United States represent distinct lineages defined by bird type. *Applied and Environmental Microbiology* AEM-01979.

**Nawrocki EM**, Hutchins LE, Eaton KA, Dudley EG. 2021. Mcc1229, an Stx2a-amplifying microcin, is produced *in vivo* and requires CirA for activity. *Infection and Immunity* IAI-00587.

Connolly CJ, Kaminsky L, Pinto GN, Sinclair PC, Bajracharya G, Yan R, **Nawrocki EM**, Dudley EG, Kovac J. 2020. Whole-genome sequences of *Salmonella* isolates from an ecological wastewater treatment system. *Microbiology Resource Announcements* 9(23).

**Nawrocki EM\***, Mosso HM\*, Dudley EG. 2020. A toxic environment: a growing understanding of how microbial communities affect *E. coli* O157:H7 Shiga toxin expression. *Applied and Environmental Microbiology* 86:e00509-20. \*Equal contributions. Selected for "Spotlight" feature highlighting articles of significant interest in this issue.

**Nawrocki EM**, Bradshaw M, Johnson EA. 2018. Botulinum neurotoxin–encoding plasmids can be conjugatively transferred to diverse clostridial strains. *Scientific Reports* 8(1):1-11.

Pellett S, Tepp WH, Bradshaw M, Kalb SR, Dykes JK, Lin G, **Nawrocki EM**, Pier CL, Barr JR, Maslanka SE, Johnson EA. 2016. Purification and characterization of botulinum neurotoxin FA from a genetically modified *Clostridium botulinum* strain. *mSphere* 1(1):e00100-15.

**Nawrocki EM**, Bedell HW, Humphreys TL. 2013. Resveratrol is cidal to both classes of *Haemophilus ducreyi*. *International Journal of Antimicrobial Agents* 41(5):477-479.

### Book Chapters

Kovac J, Dudley EG, **Nawrocki EM**, Yan R, Chung T. 2021. Whole Genome Sequencing: The Impact on Foodborne Outbreak Investigations. In: Cifuentes, A. (Ed.), *Comprehensive Foodomics*, vol. 1. Elsevier, pp. 147–159.

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**Selected Presentations**

**Nawrocki EM**, Kudva IT, Dudley EG. “Pangenome analyses of bovine rectoanal junction squamous epithelial cell–specific adherence factors in *E. coli*.” Presented as a poster at VTEC, the International Symposium on Shiga Toxin (Verocytotoxin) Producing *E. coli* Infections, Banff, Alberta, Canada, May 2023.

**Nawrocki EM**. “Pangenome analyses of bovine cell–specific adherence factors in *E. coli*.” Invited speaker in Penn State’s Food Science Seminar Series, University Park, PA, February 2023.

**Nawrocki EM**, Dudley EG. “Genome-wide analyses of *E. coli* adherence to bovine cells.” Presented as a poster at the American Society for Microbiology’s Microbe Meeting in Washington, DC, June 2022.

**Nawrocki EM**, Dudley EG. “CirA and TonB are critical for the import of Mcc1229, an Stx2a-amplifying microcin.” Presented as a poster at the World Microbe Forum online, June 2021.

Fu Y\*, M’ikanatha NM, Lorch JM, **Nawrocki EM**, Dudley EG. “*Salmonella enterica* serovar Typhimurium isolates from wild birds in the U.S. represent distinct lineages defined by bird type.” \*Presented as a poster at the World Microbe Forum online, June 2021.

**Nawrocki EM**, Dudley EG. “CirA is the receptor for Mcc1229, an Stx2a-amplifying microcin.” Accepted as a poster at the American Society for Microbiology’s Microbe Meeting in Chicago, IL, June 2020 (conference cancelled).

Loperena-González PN, Padin-López AF, Miranda-Nieves SM\*, Yoder K, **Nawrocki EM**, Dudley EG, Malavez-Acevedo Y. “Whole genome sequencing and bioinformatics analysis of *E. coli* isolates from different farm management systems in Puerto Rico.” \*Presented as a poster at the Allegheny Branch of the American Society for Microbiology’s Annual Meeting in Loretto, PA, November 2019.

**Nawrocki EM**, Fredrick CM, Bradshaw M, Johnson EA. “Group I *C. botulinum* plasmids are capable of conjugation.” Presented as a poster at the Molecular Genetics of Bacteria and Phages Meeting in Madison, WI and at the Interagency Botulism Research Coordinating Committee Meeting in San Francisco, CA, Fall 2017.

**Nawrocki EM**, Bradshaw M, Johnson EA. “Large BoNT-encoding plasmids are transferred by conjugation.” Presented as a poster at the Interagency Botulism Research Coordinating Committee Meeting in Atlanta, GA, October 2016.

**Nawrocki EM**, Humphreys TL. “Biofilm formation in wildtype and mutant *Haemophilus ducreyi*.” Presented as a poster at the American Society for Microbiology General Meeting in Denver, CO, May 2013.

**Nawrocki EM**, Humphreys TL. “Biofilm formation in wildtype and mutant *Haemophilus ducreyi*.” Presented orally at the Penn State Behrend-Sigma Xi Undergraduate Research and Creative Accomplishment Conference in Erie, PA, April 2013.

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**Honors and Awards**

- 2023 Travel Award, VTEC 2023 Organizing Committee  
2017 Graduate Travel Award, UW-Madison Bacteriology Department  
2017 Dorothy Strong Scholarship, UW-Madison College of Agricultural & Life Sciences  
2013 Molecular Biosciences Training Grant, UW-Madison (NIH T32 Award)  
2013 Outstanding Senior Major Award, Allegheny College Biology Department  
2013 Harold M. State Research Fellowship, Allegheny College  
2012 Inductee, Phi Beta Kappa  
2012 Undergraduate Research Fellowship, American Society for Microbiology  
2012 Travel Grant, Council for Undergraduate Research  
2012 Outstanding Junior Major Award, Allegheny College Biology Department  
2012 Honorable Mention, Barry M. Goldwater Scholarship  
2011 Research Experience for Undergraduates Fellowship, NSF

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**Outreach and Service**

- 2023 Speaker, Penn State Phi Tau Sigma Chapter's "Food Science in Action" Day  
2020- Ad Hoc Reviewer: *Frontiers in Microbiology*, *Frontiers in Sustainable Food Systems*, *Microbial Genomics*, *mSpectrum*, *mSphere*, *PeerJ*  
2019 Mentorship Training Certificate, Penn State Office of Postdoctoral Affairs  
2016-2017 Alumni Mentor, Pennsylvania Governor's School for the Sciences  
2014 Mentor, Madison Middle School Science Symposium  
2012-2013 Chapter President, Beta Beta Beta Biology Honor Society