

Hannah M. McMillan

Ph.D. Candidate | Kuehn Lab
hannah.mcmillan@duke.edu
hamcmillan.com | linkedin.com/in/hamcmillan

EDUCATION

Duke University, Durham, NC (May 2021)
Ph.D. in Molecular Genetics and Microbiology
Program in Cell and Molecular Biology
Certificate in College Teaching

Davidson College, Davidson, NC (May 17, 2015)
Bachelor of Science in Biology
Minor in Dance
Magna Cum Laude, Honors in Biology

RESEARCH AND PROFESSIONAL EXPERIENCE

- 2015-present** **Duke University Department of Microbial Genetics and Microbiology, Program in Cell and Molecular Biology**, Durham, NC
Graduate Research Assistant, Kuehn Lab
Project: Defining the role of *Pseudomonas* outer membrane vesicles in plant infection; NSF Convergence RAISE Grant Collaboration: Harnessing extracellular vesicle mediated interkingdom communication
- 2014-2015** **Duke University Department of Biological Sciences**, Durham, NC
Undergraduate Research Assistant, Dong Lab
Projects: Profiling Calcium Dynamics in *Arabidopsis thaliana* during Effector Triggered Immunity; Developing Stably Expressing Mutant Lines using the CRISPR Targeted Genome Editing System in *Arabidopsis thaliana*
- 2013-2014** **Davidson College Department of Biology**, Davidson, NC
Undergraduate Research Assistant, Hales Lab
Project: Characterization of mitochondrial phenotypes in *Drosophila melanogaster* PINK1 and Parkin overexpression lines during spermatogenesis
- Summers 2010-2013 and Winters 2011-2013** **Duke University Department of Biological Sciences**, Durham, NC
High School/Undergraduate Research Assistant, Dong Lab
Projects: Bimolecular Fluorescence Complementation in *Arabidopsis thaliana* and *Escherichia coli*; Characterization of protein pathways and protein interactions using yeast two-hybrid techniques in *Saccharomyces cerevisiae*; Exploring the relationship between the circadian clock and plant immunity in *Arabidopsis thaliana*

PUBLICATIONS

- 2020** **MCMILLAN, H. M., ZEBELL, S. G., RISTAINO, J. B., DONG, X. & KUEHN, M. J.** 2020. Protective Plant Immune Responses are Elicited by Bacterial Outer Membrane Vesicles. bioRxiv, 2020.07.24.220160. (*In Press, Cell Reports*)
- 2020** **MCMILLAN, H. M. and KUEHN, M.J.** 2020. The Bacterial EV Generation Paradox: A Bacterial Point of View. (*In Preparation*)
- 2020** **MCMILLAN, H. M., ROGERS, N., WADLE, A., KUEHN, M. J., HSU-KIM, H., WIESNER, M. R., HENDREN, C. O.** 2020. Understanding Vesicle-Mediated Interkingdom Communication: A Convergence of Environmental Nanomaterial Science, Biogeochemistry, and Cellular Biology. (*In Preparation*)

TEACHING AND MENTORING

- Fall 2020** **Graduate Student Rotation Mentor**
Duke University Kuehn Lab, Durham, NC
Student: Alex Hofler
Projects: biochemical fractionation of *Pseudomonas aeruginosa* vesicles and characterization of their immunogenicity in plants
- Fall 2019** **Graduate Student Rotation Mentor**
Duke University Kuehn Lab, Durham, NC
Student: George Georgiou
Projects: surface properties of bacterial vesicles and biotin labeling
- Spring 2019** **Teaching Assistant, Microbial Pathogenesis**
Duke University Molecular Genetics and Microbiology Department, Durham, NC
Responsibilities: Lead four paper discussion sessions, write and grade exam questions
- Spring 2019** **Graduate Student Rotation Mentor**
Duke University Kuehn Lab, Durham, NC
Students: Zeni Ramirez, MS; Clariss Limso, MS
Projects: bacterial vesicle interaction with the plant cell wall (ZR) and within biofilms (CL)
- 2018-2019** **Preparing Future Faculty Fellow**
*Duke University Graduate School, Durham, NC and
NC State University Department of Biology, Raleigh, NC*
Mentor: Jean Ristaino, Ph.D.
- Spring 2018** **Teaching Assistant, Introductory Biochemistry I**
Duke University Department of Biochemistry, Durham, NC
Responsibilities: Lead two recitation sessions, hold two office hours per week, grade exams
- Spring 2018** **Microbiology Workshop Designer**
Catalyst Program for Students with Disabilities Saturday Workshop, Raleigh, NC
Responsibilities: Design lesson plan and teach workshop to Catalyst students
- 2017-present** **Lesson Plan Developer**
The Scientific Research and Education Network, Raleigh, NC
Responsibilities: Design lesson plan for NC educators to implement in classrooms
- 2016-2018** **Outreach Coordinator and Curriculum Developer**
Molecular Genetics and Microbiology Department Outreach, Durham, NC
Responsibilities: Design new curriculum for activities, plan ~10 events per year, organize volunteers, secure funding for activities and supplies
- 2012-2015** **Biology and Chemistry Tutor**
Math and Science Center at Davidson College, Davidson, NC
Responsibilities: Teaching assistant for Plant Biology course, hold weekly drop in tutoring hours for all courses in biology; introductory, and organic chemistry



LEADERSHIP EXPERIENCES

- 2020-2021** **Duke Student Alumni Board**
Duke University Alumni Association, Durham, NC
- 2020-2021** **Co-Chair Campus Pantry Collaborative**
Duke University GPSC Community Pantry, Durham, NC
- 2019-2020** **Chair of Resource Directory Task Force**
Graduate and Professional Student Council, Durham, NC
- 2018-2021** **Bacterial Pathogenesis Symposium Organizer**
Duke Cell Host and Microbial Interactions Supergroup, Durham, NC
- 2018-2021** **Campus Food Insecurity Symposium Organizer**
Duke-UNC Campus Pantry Collaborative Initiative, Durham, NC
- Spring 2019** **Emerging Leaders Institute**
Duke University Graduate School, Durham, NC
- 2018-2019** **Director of Community Outreach**
Executive Board Graduate and Professional Student Council, Durham, NC
- 2018-2019** **Outreach Coordinator**
Duke University Biochemistry Department Graduate Student Council, Durham, NC
- 2018-present** **Laboratory Safety and Chemical Hygiene Officer**
Duke University Kuehn Lab, Durham, NC
- 2017-present** **Operations and Donations Volunteer**
Graduate and Professional Student Council Food Pantry, Durham, NC
- 2017-2018** **Cell and Molecular Biology Representative**
Graduate and Professional Student Council, Durham, NC
- Spring 2017** **Panelist Recruiter and Event Coordinator**
Alternative Career Panel, Durham, NC
- 2016-2017** **Content Developer**
Cell and Molecular Biology Website Committee, Durham, NC

PRESENTATIONS

CONFERENCES

- Nov. 2020** **McMillan HM, Zebell S, Dong X, Kuehn MJ.** “Bacterial Vesicles: Vehicles for Inter-kingdom Communication and Modulators of Plant Immune Response.” *2020 Annual Meeting of the American Society for Exosomes and Microvesicles. Virtual. (Speaker selected from abstracts)*

- July 2020** **McMillan HM**, Zebell S, Ristaino JB, Dong X, Kuehn MJ. “Bacterial Vesicles Elicit Protective Plant Immune Responses.” *ASPB: Plant Biology 2020. Virtual. (iPoster)*
- July 2019** **McMillan HM**, Zebell S, Dong X, Kuehn MJ. “Bacterial vesicles: double agents for plant defense.” *Gordon Research Conference: Microbial Adhesion and Signal Transduction. Newport, RI. (Poster)*
- July 2019** **McMillan HM**, Zebell S, Dong X, Kuehn MJ. “Bacterial vesicles: double agents for plant defense.” *XVII Congress of the International Society for Molecular Plant Microbe Interactions. Glasgow, Scotland. (Poster)*
- June 2018** **McMillan HM**, Kuehn MJ. “Small Vesicles Pack a Big Punch: Bacterial Outer Membrane Vesicles Activate Plant Immune Responses.” *American Society for Microbiology: Microbe. Atlanta, GA. (Poster)*
- Mar. 2018** **McMillan HM**, Kuehn MJ. “Bacterial Vesicles as Novel Plant Immune Activators: Plants Take the W in the Fight for Defense Response.” *Cells vs. Pathogens: Intrinsic Defenses and Counterdefenses. Monterey, CA. (Poster)*
- Sept. 2017** **McMillan HM**, Dong X, Kuehn MJ. “Bacterial vesicles: novel plant immune activators.” *Bayer Crop Science 3rd Research Symposium. Durham, NC. (Poster)*
- June 2017** **McMillan HM**, Kuehn MJ. “A novel OMV-mediated bacterial mechanism for plant innate immune activation.” *American Society for Microbiology: Microbe. New Orleans, LA. (Poster)*
- Aug. 2014** **McMillan HM**, Zebell S, Dong X, Ph. D. “Profiling Calcium Dynamics during Effector Triggered Immunity.” *28th Annual Plant Molecular Biology Retreat. Wrightsville Beach, NC. (Chalk Talk)*

TALKS

- Nov. 2020** **McMillan HM**, Kuehn MJ. “Bacterial Vesicles Activate Protective Plant Immune Responses.” *Biochemistry Department Research Meeting. Virtual. (Seminar Speaker)*
- Oct. 2020** **McMillan HM**, Kuehn MJ. “Bacterial Vesicles Protect Against Pathogen Challenge in Plants.” *Cell Host and Microbial Interactions Supergroup: Bacterial Pathogenesis Symposium. Virtual. (Flash Talk Speaker)*
- June 2020** **McMillan HM**, Kuehn MJ. “Bacterial outer membrane vesicles activate plant immune responses.” *Molecular Genetics and Microbiology Department Research Meeting. Durham, NC. (Seminar Speaker)*
- Jan. 2020** **McMillan HM**, Kuehn MJ. “Bacterial outer membrane vesicles activate protective plant immune responses.” *VESICLE Quarterly Workshop. Durham, NC. (Speaker)*
- Feb. 2019** **McMillan HM**, Kuehn MJ. “When Bacteria Attack: Vesicles and the Plant-Pathogen Interaction.” *Cell and Molecular Biology Program Recruitment. Durham, NC. (Requested Flash Talk Speaker)*

- Dec. 2018** **McMillan HM**, Kuehn MJ. “Small Vesicles Pack a Big Punch: Bacterial Outer Membrane Vesicles Activate Plant Immune Responses.” *Duke University Cell and Molecular Biology Student Symposium: Proteins, to Pathways, to Patients. Durham, NC (Invited Speaker)*
- Oct. 2018** **McMillan HM**, Kuehn MJ. “Bacterial Vesicles: Double Agents for Plant Defense.” *Duke University Biochemistry Departmental Retreat. Wrightsville Beach, NC. (Speaker)*
- Sept. 2018** **McMillan HM**, Kuehn MJ. “Bacterial Vesicles: Double Agents for Plant Defense.” *Duke University Molecular Genetics and Microbiology Departmental Retreat. Wrightsville Beach, NC. (Speaker)*
- May 2018** **McMillan HM**, Kuehn MJ. “Bacterial vesicles induce protective plant immune responses.” *Molecular Genetics and Microbiology Department Research Meeting. Durham, NC. (Seminar Speaker)*
- Mar. 2018** **McMillan HM**, Kuehn MJ. “Tiny but Mighty: Bacterial Vesicles Induce Protective Plant Immune Responses.” *University of California Berkeley. Berkeley, CA. (Invited Seminar Speaker)*
- Feb. 2018** **McMillan HM**, Kuehn MJ. “When Bacteria Attack: Vesicles and the Plant-Pathogen Interaction.” *Cell and Molecular Biology Program Recruitment. Durham, NC. (Requested Flash Talk Speaker)*
- Mar. 2017** **McMillan HM**, Kuehn MJ. “A novel vesicle-mediated bacterial mechanism for plant innate immune activation.” *Cell Host and Microbial Interactions Supergroup. Durham, NC. (Seminar Speaker)*
- April 2015** **McMillan HM**. "Helping Plants Fight Back: Calcium's Nuclear Role in Plant Immunity." *Davidson College Honors Thesis Presentation. Davidson, NC. (Seminar Speaker)*

POSTERS

- Jan. 2020** **McMillan HM**, Zebell S, Dong X, Kuehn MJ. “Bacterial vesicles: double agents for plant defense.” *North Carolina State University Emerging Plant Disease Symposium. Raleigh, NC.*
- Nov. 2019** **McMillan HM**, Zebell S, Dong X, Kuehn MJ. “Bacterial vesicles: double agents for plant defense.” *Symposium on Food Systems, Nutrition, and the Microbiome. Durham, NC.*
- Sept. 2019** **McMillan HM**, Zebell S, Dong X, Kuehn MJ. “Bacterial vesicles: double agents for plant defense.” *Duke University Molecular Genetics and Microbiology Department Retreat. Durham, NC.*
- May 2019** **McMillan HM**, Zebell S, Dong X, Kuehn MJ. “Small Vesicles Pack a Big Punch: Bacterial Outer Membrane Vesicles Activate Plant Immune Responses.” *Innate Immunity, Inflammation, and Disease. Durham, NC.*
- Dec. 2018** **McMillan HM**, Kuehn MJ. “Small Vesicles Pack a Big Punch: Bacterial Outer Membrane Vesicles Activate Plant Immune Responses.” *Duke University Cell and Molecular Biology Student Symposium: Proteins, to Pathways, to Patients. Durham, NC.*

- Oct. 2018** **McMillan HM**, Kuehn MJ. “Small Vesicles Pack a Big Punch: Bacterial Outer Membrane Vesicles Activate Plant Immune Responses.” *Duke University Biochemistry Department Retreat. Wrightsville Beach, NC.*
- Sept. 2018** **McMillan HM**, Kuehn MJ. “Small Vesicles Pack a Big Punch: Bacterial Outer Membrane Vesicles Activate Plant Immune Responses.” *Duke University Molecular Genetics and Microbiology Department Retreat. Wrightsville Beach, NC.*
- May 2018** **McMillan HM**, Kuehn MJ. “Bacterial Vesicles as Novel Plant Immune Activators: Plants Take the W in the Fight for Defense Response.” *Innate Immunity, Inflammation and Disease. Durham, NC.*
- April 2018** **McMillan HM**, Kuehn MJ. “Bacterial Vesicles as Novel Plant Immune Activators: Plants Take the W in the Fight for Defense Response.” *Women in Science Symposium. Durham, NC.*
- Oct. 2017** **McMillan HM**, Dong X, Kuehn MJ. “Bacterial vesicles: novel plant immune activators.” *Duke University Biochemistry Department Retreat. Wrightsville Beach, NC.*
- Sept. 2017** **McMillan HM**, Dong X, Kuehn MJ. “Bacterial vesicles: novel plant immune activators.” *Duke University Molecular Genetics and Microbiology Department Retreat. Wrightsville Beach, NC.*
- June 2017** **McMillan HM**, Kuehn MJ. “A novel OMV-mediated bacterial mechanism for plant innate immune activation.” *Innate Immunity, Inflammation, and Disease. Durham, NC.*
- April 2017** **McMillan HM**, Kuehn MJ. “A novel OMV-mediated bacterial mechanism for plant innate immune activation.” *Women in Science Symposium. Durham, NC.*
- Feb. 2017** **McMillan HM**, Kuehn MJ. “A novel OMV-mediated bacterial mechanism for plant innate immune activation.” *Duke University Biochemistry Department Retreat. Wrightsville Beach, NC.*
- May 2014** **McMillan HM**, Regruto L, Hales K, Ph. D. “Effects of PINK1 and Parkin on Mitochondrial Morphology during *Drosophila melanogaster* Spermatogenesis.” *Davidson College Spring Poster Fair. Davidson, NC.*

ACADEMIC HONORS

- 2020** **Young Investigator Award**, Virtual
American Society for Exosomes and Microvesicles 2020 Annual Meeting.
- 2019** **Mitchell Meritorious Research Travel Award**, Durham, NC
Duke University Center for Host-Microbial Interactions (CHoMI).
- 2019** **Poster Award**, Durham, NC
Symposium on Food Systems, Nutrition, and the Microbiome.
- 2019** **Shimamoto Travel Award**, Glasgow, Scotland
International Society for Molecular Plant-Microbe Interactions 2019 Congress.

- 2019** **Kamin Travel Fellowship**, Durham, NC
Duke Biochemistry Department.
- 2019** **Duke Graduate School Conference Travel Award**, Durham, NC
Awarded upon competitive application.
- 2018** **Best Talk Award**, Wrightsville Beach, NC
Molecular Genetics and Microbiology Departmental Retreat.
- 2018** **Poster Award**, Durham, NC
Innate Immunity, Inflammation, and Disease Symposium.
- 2018** **Kamin Travel Fellowship**, Durham, NC
Duke Biochemistry Department. Receipt of two awards in one year is decided selectively by the department chair.
- 2018** **Kamin Travel Fellowship**, Durham, NC
Duke Biochemistry Department.
- 2018** **Duke Graduate School Conference Travel Award**, Durham, NC
Awarded upon competitive application.
- 2017** **Mitchell Meritorious Research Travel Award**, Durham, NC
Duke University Center for Host-Microbial Interactions (CHoMI).
- 2015** **Sigma Xi Grants in Aid of Research**, Durham, NC
Grants awarded to students in all areas of science and engineering based on competitive research proposal.
- 2015** **Phi Beta Kappa Society**, Davidson College Gamma Chapter
The nation's oldest honor society. Highly competitive selection is based on high academic achievement, broad academic interests, tolerance for other views, and intellectual integrity.
- 2015** **Sigma Xi Award**, Davidson, NC
Davidson College selects one student each year for this award, which recognizes excellence in scientific research.
- 2015** **Chancellor's Scholars Fellowship**, Durham, NC
Awarded to the top five applicants to Duke's Cell and Molecular Biology Ph.D. program. Funding is provided by the Chancellor of the Duke Health System.
- 2013** **GlaxoSmithKline Women in Science Scholarship**, Davidson, NC
Davidson College selects one student in their junior year for this scholarship. Funding may be applied towards tuition or research.

PROFESSIONAL SOCIETIES

- 2020-present** **American Society of Plant Biologists**
Student Member
- 2019-present** **International Society for Molecular Plant-Microbe Interactions**
Student Member
- 2018-present** **American Society for Biochemistry and Molecular Biology**
Student Member
- 2016-2019** **American Society for Microbiology**
Student Member
- 2015-present** **Phi Beta Kappa**
Student Member