


Deanna M. Pepin, MSc, PhD


Postdoctoral Fellow

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 Google Scholar
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Education

 University of British Columbia Vancouver, Canada
Doctor of Philosophy, Department of Microbiology and Immunology 09/2018 - 09/2024

- Advisor: Dr. Carolina Tropini.
- Thesis title: The functional impact of osmotic perturbation on the gut microbiota.
- Characterized the impact of osmotic stress on the gut microbiota and the loss of bacterial family Muribaculaceae, a vanishing family of gut commensal bacteria.
- Results identified long-term changes to intestinal physiology and lost colonization resistance against enteric pathogens *Salmonella* and *Citrobacter rodentium*.


 University of Alberta Edmonton, Canada
Master of Science, Department of Agricultural, Food and Nutritional Science 05/2016 - 08/2018

- Advisor: Dr. Benjamin Willing.
- Thesis title: The microbial modifying properties of re-used chicken litter and iodinated water on poultry health and disease resistance.
- Investigated the effects of iodinated water and chicken litter exposure on early establishment of intestinal microbiota, *Salmonella* resistance, growth performance, and host intestinal transcriptome in poultry.
- Results indicated the importance for the early development of the stable microbiome in young chicks for improved growth performance and infection resistance in poultry.


 The King's University Edmonton, Canada
Bachelor of Science 09/2010 - 04/2014


- Major: Biology
- Double minor: Chemistry and Psychology.


Awards and Grants

 NSERC PGS-D Scholarship
Doctoral Award program provides financial support to high-calibre students who are engaged in a doctoral program in the natural sciences.

 UBC 4YF Award
Four Year Doctoral Fellowship (4YF) program is awarded to UBC's best PhD students to provide financial support for up to four years of their doctoral studies.


 UBC Faculty of Science PhD Tuition Award
4-year full tuition coverage, Estimated value \$22,000.

 Best Poster, Judge's Choice
Conference: Having IMPACTT: Advancing Microbiome Research.
Title: Mechanisms of tolerance to osmotic perturbations by the gastrointestinal microbiota.

 Award of Excellence
Conference: Canadian Institutes of Health Research National Research Poster presentation.
Title: Impact of osmotic perturbations on the gut microbiota and host health.

 Poster Award - 1st Place
Conference: UBC School of Biomedical Engineering 2nd Annual Symposium. Title: Impact of osmotic perturbations on the gut microbiota and host health.

 AFNS Outstanding Graduate Student Research Award (Nominee)
Department of Agricultural, Food & Nutritional Science award to the top MSc student at each convocation determined by the Graduate Program Committee.

 Mitacs Accelerate Internship
Co-authored a successful proposal for Mitacs Accelerate Internship (PI: Ben Willing, Value: \$30,000).

 Food and Health Innovation Initiative Vitamin Fund
Authored a successful proposal for Food and Health Innovation Initiative Vitamin Fund (PI: Ben Willing, Value: \$10,000).

Employment

Willing Lab, University of Alberta Edmonton, Canada
Research Assistant 07/2015 - 04/2016

Researched and developed standard of procedures, conducted animal experiments, collected samples, ran data analysis, and generated reports to present at company-wide meetings with the following companies:

- BioLargo Water Inc.: Tested new water iodination techniques to reduce *Salmonella enterica* infection in poultry to be used in agricultural processes. Results identified safe concentrations of iodine in water for poultry consumption.
- NovoBind Livestock Therapeutics Inc.: Ran pharmacokinetic studies and tested novel single-domain antibodies in poultry to reduce *Salmonella enterica* infection. Findings helped to improve development of active oral antibody treatment for *Salmonella* infection in poultry.

Exciton Technologies Inc. Edmonton, Canada
Research Technician 05/2014 - 06/2015

Evaluated the antimicrobial properties of novel silver-based wound care products to control infection in chronic wounds and developed and validated an FDA compliant antimicrobial susceptibility test method.

Publications

Ghezzi, H., Fan, Y.M., Ng, K.M., Burckhardt, J.C., **Pepin, D. M.**, Lin, X., Ziels, R.M. and Tropini, C. (2024). PUPpy: a primer design pipeline for substrain-level microbial detection and absolute quantification. *Mosphere*, 9(7), pp.e00360-24.

Ng, K. M.* , Pannu, S.* , Liu, S., Burckhardt, J. C., Hughes, T., Van Treuren, W., Nguyen, J., Naqvi, K., Nguyen, B., Clayton, C. A., **Pepin, D. M.**, Collins, S. R., & Tropini, C. (2023). Single-strain behavior predicts responses to environmental pH and osmolality in the gut microbiota. *Mbio*, e00753-23.

Ju, T., Bourrie, B. C., Forgie, A. J., **Pepin, D. M.**, Tollenaar, S., Sergi, C. M., & Willing, B. P. (2023). The Gut Commensal *Escherichia coli* Aggravates High-Fat-Diet-Induced Obesity and Insulin Resistance in Mice. *Applied and Environmental Microbiology*, 89(3), e01628-22.

Forgie, A. J., **Pepin, D. M.**, Ju, T., Tollenaar, S., Sergi, C. M., Gruenheid, S., & Willing, B. P. (2023). Over supplementation with vitamin B12 alters microbe-host interactions in the gut leading to accelerated *Citrobacter rodentium* colonization and pathogenesis in mice. *Microbiome*, 11(1), 1-22.

Nguyen, J., **Pepin, D. M.**, & Tropini, C. (2021). Cause or effect? The spatial organization of pathogens and the gut microbiota in disease. *Microbes and Infection*, 23(6-7), 104815.

Forgie, A.J., Gao, Y., Ju, T., **Pepin, D.M.**, Yang, K., Gänzle, M.G., Ozga, J.A., Chan, C.B. and Willing, B.P. (2019). Pea polyphenolics and hydrolysis processing alter microbial community structure and early pathogen colonization in mice. *The Journal of Nutritional Biochemistry*, 67, 101-110.

*Willing, B. P., **Pepin, D. M.**, Marcolla, C. S., Forgie, A. J., Diether, N. E., & Bourrie, B. C. (2018). Bacterial resistance to antibiotic alternatives: a wolf in sheep's clothing?. *Animal Frontiers*, 8(2), 39-47. (*All authors are co-first authors).

Kalan, L. R., **Pepin, D. M.**, Ul-Haq, I., Miller, S. B., Hay, M. E., & Precht, R. J. (2017). Targeting biofilms of multidrug-resistant bacteria with silver oxynitrate. *International Journal of Antimicrobial Agents*, 49(6), 719-726.

Oral presentations

Immunology 2023 - Washington, DC. 05/2023

A vanishing family of commensal bacteria and its impact on host health and disease.
Pepin, D. M., Popple, S., Ghezzi, H., Seo, J., Osborne, L., & Tropini, C.

Canadian Digestive Diseases Week (Research Topics) - Montreal, Canada. 02/2020

Impact of osmotic perturbations on the gut microbiota and host health.
Pepin, D. M. & Tropini, C.

Symposium on Gut Health in Production of Food Animals - St. Louis, U.S.A. 11/2017

Microbial modifying properties of re-used litter and iodinated water in poultry production.
Pepin, D. M., Munyaka, M.P., Kommadath, A., Stothard, P., and Willing, B.P.

Poster presentations

Keystone Symposia - The Human Microbiome: Ecology and Evolution. Banff, Canada. Mechanisms of tolerance to osmotic perturbations by the gastrointestinal microbiota. Pepin, D. M., He, J., Burckhardt, J.C., Ng, K., & Tropini, C.	12/2022
Having IMPACTT: Advancing Microbiome Research Symposium. Virtual meeting. Mechanisms of tolerance to osmotic perturbations by the gastrointestinal microbiota. Pepin, D. M., Ng, K., Sonnenburg, J., & Tropini, C.	06/2021
Canadian Student Health Research Forum. Virtual meeting. Impact of osmotic perturbations on the gut microbiota and host health. Pepin, D. M. & Tropini, C.	08/2020
University of British Columbia School of Biomedical Engineering 2nd Annual Symposium. Vancouver, Canada. Impact of osmotic perturbation on gut microbiota resilience and host health. Pepin, D. M. & Tropini, C.	05/2019
Keystone Symposia Conference: Microbiome, Host Resistance and Disease. Banff, Canada. The effect of vitamin B12 on the intestinal microbiota and infection resistance. Pepin, D. M., Yousefi, M., Gruenheid, S., Willing, B.P.	02/2018

Teaching

Sessional Lecturer, Microbiology 430B - Seminars in Microbiological Research Responsible for designing and delivering lectures on microbiome colonization resistance, leading discussions, guiding students in critically evaluating primary research papers, grading assessments, and managing final grade submissions.	University of British Columbia 01/2025 - Present
Guest Lecture, Microbiology 413 - Topics in Microbiome Research Developed and instructed a lecture to 30+ students on ethical standards in human microbiome research.	University of British Columbia 04/2023
Life Sciences Institute Teaching Assistant Training Program Instructor for LSI TATP Summer Workshop responsible for generating training materials and educating 30+ graduate student TAs on ways to develop and improve their teaching skills.	University of British Columbia 2020 - 2022
Teaching Assistant, Microbiology 302 - Immunology Instructed twice-weekly tutorials to 30+ students to review concepts covered in lectures and developed and instructed a lecture to 200+ students on the relationship between the microbiome and mucosal immunity.	University of British Columbia 2019 - 2021
Animal Science 311 - Metabolic Physiology of Domestic Animals Instructed three lab sections biweekly of 20+ Bachelor of Animal Science students, demonstrating experimental techniques for evaluating animal digestive physiology, held office hours for students, & graded lab reports.	University of Alberta 2018

Mentorship

Undergraduate and Graduate Research Supervisor

University of British Columbia
2019 - Present

Supervised and trained undergraduate students in the lab to complete their Directed Studies Course and research internships to develop and conduct independent research projects. PI: Carolina Tropini.

- Sarah Popple (September 2019-August 2020). Mentee advanced to graduate school at UBC, Osborne Lab.
- Bachviet Nguyen (September 2020-August 2021). Mentee advanced to medical school at UBC.
- Jerry He (May 2022-August 2022). Mentee advanced to graduate school at UBC, Tropini Lab.
- Claire Siu (April 2023-December 2023). Mentee advanced to graduate school at UBC, Tropini Lab.
- Apsara Srinivas (May 2023-Present). Mentee advanced to graduate school at UBC, Tropini Lab.

National Summer Undergraduate Research Project Mentor

University of British Columbia
2020

Virtual summer research internship program to support traditionally underrepresented students to experience scientific research. Participated in Black, Indigenous, People of Color (BIPOC) weekly seminars and online lectures focused on science, ethics, and professional development. PI: Carolina Tropini. Mentee: Shirmarie Starks.

- Supported the collection, interpretation and organization of 100+ scientific research articles characterizing key findings in the literature involving Muribaculaceae, an important gut commensal.
- Mentee advanced to Doctor of Optometry program at Massachusetts College of Pharmacy and Health Sciences School of Optometry.

Summer Student Supervisor

University of Alberta
2018

Supervised international summer students to develop a research project, and supported the creation of a final poster and presentation. PI: Benjamin Willing.

- Mentees: Lisa Franke & Pravina Yadav.

Volunteering

Graduate Student Seminar Series

Coordinator

2021 - 2023

Responsible for organizing and managing a regular series of seminars given by graduate students, including raising financial sponsorship, selecting and scheduling presenters, promoting the series, and ensuring the execution of each seminar.

M&I Graduate Student Society

Event Coordinator

2019 - 2022

Planned and executed various events, such as social mixers, seminars, and networking events, that provide valuable opportunities for graduate students.

M&I Graduate Student Society

Graduate Student Mentor

2019 - 2023

Provide guidance, support, and advice to newer graduate students, including helping them navigate their academic program, helping to foster a supportive and inclusive community within the department.

Hobbies



Music

Royal Conservatory of Music Level 9 (Piano), Royal Conservatory of Music Level 3 (Voice).



Sport

Running, beach volleyball, rock climbing.



Sailing

Sail Canada Intermediate Sailing and Sail Canada Navigation Certification.