

Bridget O'Brien

Montréal, QC

bridget.obrien@mail.mcgill.ca, 705-734-4940

Education

PhD: Food Science and Agricultural Chemistry

McGill University MacDonald Campus, Montréal, QC

December 2022 - Present

MSc: Food Science and Agricultural Chemistry (Incomplete, Fast-tracked to PhD)

McGill University MacDonald Campus, Montréal, QC

September 2021 - November 2022

BSc: Microbiology and Immunology Major

McGill University, Montréal, QC

September 2017 - May 2021

- J W McConnell Entrance Scholarship

Laboratory Experience

Graduate Researcher

McGill Department of Food Science and Agricultural Chemistry

September 2021 - Present

- Using next generation sequencing technologies to understand *Klebsiella pneumoniae* bovine clinical mastitis infections with the goal of developing novel therapeutic strategies.

Visiting Graduate Researcher

University College Dublin

March 2022 - June 2022

March 2022 - June 2022

- Performed library preparation and whole genome sequencing on *K. pneumoniae* isolates.

Undergraduate Research Assistant

McGill Department of Food Science and Agricultural Chemistry

May 2020 - August 2021

- Performed literature-based research regarding antimicrobial properties of nanostructures and their potential application in meat packaging, as well as the potential foodborne transmission routes of respiratory viruses.
- Conducted an undergraduate research project studying the correlation between ruminal archaeal taxa and the levels of vitamin B₁₂ in dairy products.

Additional Experience

Event Coordinator

7th Environmental Dimension of Antimicrobial Resistance conference (EDAR7), McGill University

June 2023 – June 2024

- Developed the website for and assisted in organizing a social outreach event (Human Library), communicated conference updates via Twitter, LinkedIn, and Instagram.

Outreach Team Member

Antimicrobial Resistance Centre, McGill University

September 2022 - Present

- Assist in outreach activities related to antimicrobial resistance (AMR) including mentoring undergraduate students with AMR-related projects, writing newsletters, assisting in the organization of events, and producing social media content.

Grader

McGill University

FDSC545, Advances in Food Microbiology (January 2022 - May 2022)

MIMM323, Microbial Physiology (September 2022 - December 2022)

January 2022 - December 2022

- Thoroughly evaluated short and long answer questions on quizzes, exams, and assignments.

Publications

Journal Articles

- Suh, J., **O'Brien, B.**, Glenn, II PD., Cai, Z., Daigle, F., Faucher, SP., Ronholm, J. (2024). Draft genome sequences of 13 *Salmonella enterica* subsp. *enterica* isolates from chickens, cows, and Canadian *Salmonella* outbreaks. Microbiology Resource Announcements. doi: <https://doi.org/10.1128/mra.00989-23>
- Park, S., Jung D., **O'Brien, B.**, Ruffini, J., Dussault, F., Dube-Duquette, A., Demontier, É., et al. (2022). Comparative genomic analysis of *Staphylococcus aureus* isolates associated with either bovine intramammary infections or human infections demonstrates the importance of restriction-modification systems in host adaptation. Microbiology Society. *Microbial Genomics*. doi: <https://doi.org/10.1099/mgen.0.000779>
- Chufan, Z., Girouard, F., **O'Brien, B.**, Ronholm, J., and Wang, Y. (2022). Construction of chevaux-de-frise from cellulose nanocrystals to enable mechano-bactericidal activity on recycled waste cotton films. *Green Chem.* 24, no. 3: 1109–13. doi: <https://doi.org/10.1039/D2GC00073C>.
- O'Brien, B.**, Goodridge, L., Ronholm, J., & Nasheri, N. (2021). Exploring the potential of foodborne transmission of respiratory viruses. *Food Microbiology*, 95, 103709. doi:<https://doi.org/10.1016/j.fm.2020.103709>
- Zhou, C., Koshani, R., **O'Brien, B.**, Ronholm, J., Cao, X., & Wang, Y. (2021). Bio-inspired mechano-bactericidal nanostructures: a promising strategy for eliminating surface foodborne bacteria. *Current Opinion in Food Science*. doi:<https://doi.org/10.1016/j.cofs.2020.12.021>

Presentations

Oral

- Subtle Genomic Differences in *Klebsiella pneumoniae* May Indicate Adaptation to Distinct Hosts (2024). McGill University Antimicrobial Resistance Centre 4th Annual Symposium. Montreal, Quebec.
- Subtle Genomic Differences in *Klebsiella pneumoniae* May Indicate Adaptation to Distinct Hosts (2024). International Symposium on One Health Research: Improving Food Security and Resilience. Galveston, Texas, USA.
- Guest Lecture: Antibiotics in Agriculture and Drug-Resistant *Klebsiella pneumoniae*. (2023). FDSC545 - Advances in Food Microbiology. McGill University. Montreal, Quebec.
- Rarefaction. Theory of Microbiome Analysis Workshop. (2022). Montreal, Quebec.
- Operational Taxonomic Units. Theory of Microbiome Analysis Workshop. (2022). Montreal, Quebec.
- Variations in the Bovine Udder Microbiome of Holstein Cows with *Klebsiella pneumoniae* Clinical Mastitis Infections. (2022). Canadian Society for Microbiologists Conference. Guelph, Ontario.

Poster

- Subtle Genomic Differences in *Klebsiella pneumoniae* May Indicate Adaptation to Distinct Hosts (2024). 7th Environmental Dimension of Antimicrobial Resistance conference (EDAR7). Montreal, Quebec.
- Genomic Relationship Between *Klebsiella pneumoniae* Isolated from Bovine Clinical Mastitis Cases and Human Infections (2023). International Dairy Federation: World Dairy Summit. Chicago, Illinois, USA.
- Genomic Relationship Between *Klebsiella pneumoniae* Isolated from Bovine Clinical Mastitis Cases and Human Infections (2023). Canadian Society for Microbiologists Conference. Halifax, Nova Scotia.
- Genomic Relationship Between *Klebsiella pneumoniae* Isolated from Bovine Clinical Mastitis Cases and Human Infections (2023). McGill University Antimicrobial Resistance Centre 3rd Annual Symposium. McGill University. Montreal, Quebec.
- Variations in the Bovine Raw Milk Microbiome of Holstein Cows Correlated with Occurrence of *Klebsiella pneumoniae* Clinical Mastitis Infections (2023). Macdonald Campus Dairy Farm Open House. McGill University. Montreal, Quebec.
- Variations in the Bovine Udder Microbiome during *Klebsiella pneumoniae* Mastitis Infections. (2021). Undergraduate Student Research Award (USRA) Poster Presentations. Montreal, Canada.
- Keepin' it fresh: A Review on the Application of Nanopillars for Meat Packaging. (2020). Undergraduate Student Research Award (USRA) Poster Presentations. Montreal, Canada.

Relevant Skills

Laboratory: Aseptic technique, equipment maintenance, library preparation and DNA sequencing, microbial cell culture.

Bioinformatics: Shotgun metagenomic sequencing analysis, 16S rRNA gene amplicon sequencing analysis, whole genome sequencing analysis, R, bash, python.

Awards and Scholarships

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| Excellence in Research: Poster Winner (1 st Place) at the International Symposium on One Health Research: Improving Food Security and Resilience. | April 2024 |
| Graduate Excellence Fellowship | September 2023 |
| NSERC CGS-D | April 2023 |
| FRQNT Doctoral Training Scholarship - declined | April 2023 |
| Graduate Excellence Fellowship | September 2022 |
| Michael Smith Foreign Study Supplements | August 2021 |
| TinyEarth Studentship | April 2021 |
| Rudi Dallenbach Student Research Award | April 2021 |
| FRQNT Master's Training Scholarship | April 2021 |
| NSERC CGS-M | March 2021 |
| NSERC Undergraduate Student Research Award (USRA) | May 2020 |
| Governor General's Academic Medal | June 2017 |