Charlotte Francoeur

Microbiology Ph.D. Candidate

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Education

University of Wisconsin - Madison August 2016 - Present
Microbiology Doctoral Training Program
Laboratory of Dr. Cameron Currie, Department of Bacteriology
GPA: 4.0/4.0
2020 WISCIENCE Public Service Fellow

University of Maryland - College Park August 2012 - May 2016
Bachelor of Science in Microbiology with a Black Women's Studies Minor
GPA: 3.905/4.0
Cum Laude Latin Honors
Integrated Life Sciences Honors
Cell Biology and Molecular Genetics Departmental Honors

Research Experience

Current

Currie Lab, University of Wisconsin - Madison January 2017-Present
Graduate research assistant in the laboratory of Dr. Cameron Currie investigating bacterial and viral associations in fungus-growing ants. More details can be found at cfrancoeur.github.io/research/

Past

Wu Lab, University of Maryland - College Park September 2014 - July 2016
Institute for Bioscience and Biotechnology Research Laboratory
Volunteer undergraduate research assistant in the laboratory of Dr. Louisa Wu
Used the Drosophila Genetics Research Panel to perform a genome-wide association study (GWAS) to find genes associated with the phagocytosis of fungi in Drosophila melanogaster

Nou Lab, USDA-ARS August 2012 - May 2014
Biological Science Aid in the Environmental Microbial and Food Safety laboratory of Dr. Xiangwu Nou
Investigated biofilm formation between Ralstonia insidiosa and foodborne pathogens, Escherichia coli, Salmonella spp., and Listeria monocytogenes
Resulted in a publication (see below)

Martin Lab, USDA-ARS August 2011 - May 2012
High School Research Intern in the Invasive Insect Biocontrol and Behavior laboratory of Dr. Phyllis Martin
Investigated bacterial strains pathogenic to the brown marmorated stink bug using 16S rRNA sequencing, Biolog, and phenotypic tests (e.g. optimal growth conditions, hemolytic activity, urease production)

Peer-Reviewed Publications

Francoeur, C.B., Khadempour, L., Moreira-Soto, R.D., Gotting, K., Book, A.J., Pinto-Tomás, A.A., Keefover-Ring, K., & Currie, C.R. (2020). Bacteria contribute to plant secondary compound degradation in a generalist herbivore system. mBio 11:e02146-20. https://doi.org/10.1128/mBio.02146-20.

Liu, N. T., Bauchan, G. R., **Francoeur, C. B.**, Shelton, D. R., Lo, Y. M., & Nou, X. (2016). Ralstonia insidiosa serves as bridges in biofilm formation by foodborne pathogens Listeria monocytogenes, Salmonella enterica, and Enterohemorrhagic Escherichia coli. Food Control, 65, 14–20.

Preprints

Francoeur, C.B.#, May, D.S.#, Thairu, M., Hoang, D.Q., Panthofer, O., Bugni, T.S., Pupo, M.T., Clardy, J., Pinto-Tomás, A.A., & Currie, C.R. (2021) Burkholderia from fungus gardens of fungus-growing ants produce antifungals that inhibit the specialized

parasite Escovopsis. bioRxiv. DOI: 10.1101/2021.01.22.427492
#indicates equal contributors

Awards & Grants

1. Department of Bacteriology Allen-Lee Fellowship Award — September 2020 - 2021
2. UW-Madison CALS Dr. Leonard E. Mortenson Graduate Scholarship, $1250 — April 2020
3. O.N. Allen Soil and Environmental Microbiology Small Grant Recipient, $4000 — August 2019
4. UW-Madison Student Research Travel Grant - Conference, $1200 — June 2019
5. UW-Madison CALS Dr. Leonard E. Mortenson Graduate Scholarship, $1250 — April 2019
6. Dean's List and Academic Honors - University of Maryland — Fall 2012-Spring 2016
7. Senator Pinsky's Senatorial Scholarship — August 2012-May 2013
8. Delegate Anne Healey Scholarship — August 2012-May 2013

Teaching & Mentoring

Currie Lab Mentoring

Damayanti Rodriguez Ramos: MDTP rotation student. minION sequencing of fungus garden bacteria. — October 2020

Olivia Panthofer: Undergraduate Research Scholar. Recipient of the **UW Genetics and Genomics Distinguished Research Fellowship** 2020-2021. Isolation and metagenomic characterization of bacteriophage from fungus gardens. — 2018-Present

Jennifer Koehler: REU student. Lipid Production of Streptomyces on Conversion Residue. — Summer 2018

Donny Hoang: MDTP rotation student. Inhibition of Escovopsis by Burkholderia. — January 2018

Josh Daniels: Undergraduate student. Investigation of Bee-Associated Streptomyces species and their ability to produce lipids. — 2017-2018

Laura Williams: Undergraduate student. Characterization of Burkholderia sp. isolated from the fungus gardens of fungus farming ants. — 2017-2018

Teaching

Assistant Teacher — September 2017 - December 2017

-Assistant teacher for Pathogenic Bacteriology with Professor Joe Dillard
-Duties include giving three lectures (Antibiotics + Disinfection, Clostridia, Treponema and Borrelia), writing and grading exams, and meeting with students

Undergraduate Teaching Assistant — January 2016 - May 2016

-Teacher's assistant for Research Applications in the Life Sciences (HLSC377). Duties included weekly office hours, grading assignments, and aiding discussions about scientific papers

Oral Presentations

1. **Francoeur, C.B.** How Microbes Shape Our Lives, Transform the Environment, and Influence Climate Change. **Invited Speaker** for the 2021 UW-Madison Arboretum Winter Enrichment Lecture Series. — February 2021

2. **Francoeur, C.B.**, May, D.S., Thairu, M., Hoang, D.Q., Panthofer, O., Bugni, T.S., Pupo, M.T., Clardy, J., Pinto-Tomás, A.A., & Currie, C.R. Attine fungal garden Burkholderia produce antifungals and inhibit the specialized parasite Escovopsis. **Student Speaker** at the Entomology 2020 Virtual Annual Meeting. — November 2020

3. **Francoeur, C.B.**, Khadempour, L., Moreira-Soto, R.D., Gotting, K., Book, A.J., Pinto-Tomás, A.A., Keefover-Ring, K., & Currie, C.R. Bacteria contribute to plant secondary compound degradation in a generalist herbivore system. **Winner** of the **Lightning Talk Competition** at the 9th Annual UW-Madison Plant Sciences Symposium. — November 2019

4. **Francoeur, C.B.**, Khadempour, L., Keefover-Ring, K., & Currie, C.R. Garden bacteria in fungus-farming ants can metabolize plant secondary compounds. **Selected Speaker** at the Gordon Research Seminar on Animal-Microbe Symbioses. — June 2019

5. **Francoeur, C.B.** & Currie, C.R. Characterizing microbial associations in leaf-cutter ant fungus gardens. **MDTP Student Seminar Series Talk** at University of Wisconsin - Madison. — October 2018

6. **Francoeur, C.B.**, Nazario-Toole, A., & Wu., L. Genome Wide Assocation Study on Phagocytosis of Zymosan in Drosophila melanogaster. **Senior Thesis Talk** at University of Maryland - College Park. — May 2016

7. **Francoeur, C.B.**, Nazario-Toole, A., & Wu., L. Genome Wide Assocation Study on Phagocytosis of Zymosan in Drosophila melanogaster. **ILS Student Seminar Series** at — March 2016

University of Maryland - College Park.

8. **Francoeur, C.B.**, Price, T., & Martin, P. Isolation and Identification of Pathogenic Bacteria From Stink Bugs. **Research Symposium Talk** at Eleanor Roosevelt High School. April 2012

Poster Presentations

1. **Francoeur, C.B.**, Khadempour, L., Moreira-Soto, R.D., Gotting, K., Book, A.J., Pinto-Tomás, A.A., Keefover-Ring, K., & Currie, C.R. Bacteria contribute to plant secondary compound degradation in a generalist herbivore system. **Poster Presentation** at the 9th Annual UW-Madison Plant Sciences Symposium (Nov. 15) and the Entomological Society of America 2019 Conference (Nov. 18). November 2019

2. **Francoeur, C.B.**, Khadempour, L., Keefover-Ring, K., & Currie, C.R. Garden bacteria in fungus-farming ants can metabolize plant secondary compounds. **Poster Presentation** at the Gordon Research Seminar and Gordon Research Conference on Animal-Microbe Symbioses. June 2019

3. **Francoeur, C.B.**, Khadempour, L., Currie, C.R. Microbial tolerance of plant defense compounds in the fungus-farming ant system. **Poster Presentation** at the 8th Annual UW-Madison Plant Sciences Symposium. November 2018

4. **Francoeur, C.B.**, Hoang, D., Carlos, C., & Currie, C.R. Potential roles of Burkholderia in the fungus-farming ant system. **Poster Presentation** at the Beneficial Microbes Meeting. July 2018

5. **Francoeur, C.B.**, Khadempour, L., Currie, C.R. Microbial tolerance of plant defense compounds in the fungus-farming ant system. **Poster Presentation** at Madison Microbiome Meeting. April 2018

6. **Francoeur, C.B.**, Khadempour, L., Currie, C.R. Microbial tolerance of plant defense compounds in the fungus-farming ant system. **Poster Presentation** at the DOE Joint Genome Institute Genomics of Energy and Environment Meeting. March 2018

7. **Francoeur, C.B.** & Martin, P. Identifying Bacteria From Stink Bugs. **Poster Presentation** at Eleanor Roosevelt High School Research Symposium. April 2012

Professional Development & Fieldwork

1. **WISCIENCE Public Service Fellows** January 2020-February 2021

-Developed an illustrated booklet for the UW-Madison Arboretum about microbes, titled **The Wonderful World of Microbes**, that will be freely available in English, Spanish, and Hmoob in March.
-Participant in the Winter Enrichment Lecture Series.

2. **Active Learning Ambassadors Workshop** California State University, Northridge October 2019

3. **Costa Rica Fieldwork** at La Selva Biological Station March-April 2019

4. **Ant Course** French Guiana, Nouragues Research Station August-Sept 2018

-Acquired training on classification, identification, sample preparation, dissection, and general roles of ants.

5. **Costa Rica Fieldwork** at La Selva Biological Station March-April 2018

-Trained on the collection, upkeep, and transportation of fungus-growing ants

6. **Anvi'o Workshop** UW-Madison May 2017

7. **Microbiota Analysis in R** UW-Madison November 2016

8. **Microbiota Processing in mothur** UW-Madison November 2016

Committees

MDTP Steering Committee 2019-2020

MDTP Student Invited Speaker Committee 2017-2019

Leadership & Volunteering

MDTP Student Host 2018-2020

UW-Madison Women's Club Ultimate Frisbee B Team Coach 2018-2020

Junior Science Cafe (through the Morgridge Institute for Research) Fall 2017

Women's Maryland Club Ultimate B Team Captain 2014-2016

Women's Maryland Club Ultimate Treasurer 2013-2016

Relevant Classes

2017 CS 301: Introduction to Data Programming (Python)
MICROBIO526: Microbial Physiology
MICROBIO875: Bioinformatics for Microbiologists

2016 MICROBIO655: Biology and Genetics of Filamentous Fungi
ENST432: Environmental Microbiology

2015 BSCI467: Freshwater Biology
BSCI424: Pathogenic Microbiology