

## University of Toronto Graduate Positions: Soil Microbial Niche Breadth

**\*\*Please note that our graduate program is no longer reviewing international applicants for 2023 entry, so applicants must be Canadian citizens or permanent residents. Canadian graduate students are heavily subsidized, making grad positions for international students highly competitive.\*\***

I moved my lab from The Pennsylvania State University to the University of Toronto in Scarborough in the Department of Physical and Environmental Sciences in January 2023. I am looking for graduate students to start in 2023 to help launch my new program.

Student projects can focus on the fundamental and/or applied consequences of microbial niche breadth. Fundamentally, microbial compatibility with various environments helps to determine microbial biogeography. While a broad environmental range may provide benefits to a microbe, there are likely costs to carrying more survival traits; however, we know little about the relative costs of different types of generalism (e.g. resource generalists vs. thermal generalists). From an applied perspective, understanding the factors that shape the niche breadth of microorganisms can help us in designing more effective microbial inoculants, for agriculture and otherwise. Such inoculants are promising alternatives to chemical additives, such as inorganic fertilizers and pesticides, but are still largely unpredictable in field settings.

Project development will depend on a combination of lab needs and student interests, but I expect most student projects will contribute to one of the following three areas:

1.Environmental filtering to collect microbes with unique ecological traits 2.Directed evolution to modify microbial niche breadth 3.Modification of environmental stressors and opportunities to affect in-field microbial survival and function

To date, I have worked with an amazing and diverse group and appreciate the value that many types of diversity have brought to our work. This includes, but is not limited to, diversity in academic training, problem-solving approaches, and personal backgrounds and experiences. Je suis content d'intégrer en anglais ou en français.

If interested, please send a CV, a letter of interest, unofficial transcripts, and contact info for 3 references to [terrence.bell@utoronto.ca](mailto:terrence.bell@utoronto.ca).

Information on the Department can be found here: <https://www.uts.utoronto.ca/physsci/>