University of Manitoba Faculty Profiles

Dr. Jim Roth
Associate Professor, Biological Sciences
What opportunities do undergraduates have in your lab?

Much of the work in my lab involves understanding how feeding relationships among organisms drive changes in population sizes; i.e., how predator-prey interactions affect population dynamics.

We reconstruct diets of wildlife using stable isotope analysis on a variety of tissues of different species, and this method that requires a lot of sample preparation (freeze drying, lipid extraction, homogenizing, and weighing).

We also have thousands of photographs each year from trail cameras at Arctic fox dens that need to be viewed to document fox activity, including patterns of occupancy, litter sizes, and use of dens by other wildlife species. In addition to our field work, these activities in the lab provide many opportunities for students to gain research experience.

Why is research experience valuable for undergraduates?
Research experience gives students an understanding of how science is done, and how we figure out the way the world works. By participating in research, students learn if it's something they'd like to pursue later on, and become more competitive for other opportunities in science.

What value do undergraduates get from publishing?
Science builds on what has been learned in previous research, and publications are how we communicate what we've learned. Peer-reviewed publications are the litmus test by which research validity is evaluated, and publications are the standard measure of research productivity required to secure funding for more research and training.

Experiencing the process helps students understand how we communicate science and the standards we must meet.

What does it take to be successful in biology?
Hard work and persistence! Grades are important, but getting some experience is key. You need to develop skills, as well as gain knowledge. Writing ability and quantitative skills are particularly valuable.

What advice would you give students in biology?
Commit to learning as much as you can in class, and gain as many different types of experiences outside of class as possible. Biology is a diverse discipline, addressing levels of organization from molecules to ecosystems, so figure what you enjoy doing. If you like it, you'll work hard at it. If you work hard at it, you'll become good at it. If you become good at it, you could get a job doing it!

Dr. Denice Bay
Assistant Professor,
Medical Microbiology & Infectious Diseases

Why is research experience valuable for undergraduates?
That's a great question! If you are pursuing an undergraduate degree, let's say in microbiology, you are essentially studying to be a researcher and getting research exposure; "getting your hands wet" so to speak, will be the most valuable experience that you will have.

In the lab, you have the opportunity to combine the theoretical aspects, learned in class, with practical skills. It is also a great opportunity to gather valuable information on the strengths and weaknesses of the field. In addition, you are in an environment that fosters scientific thinking, where you are free to explore and learn, which does not only solidify what you've been learning in class but is also an excellent way to determine whether research is the appropriate career path for you.

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> — *Dr. Jim Roth*

What opportunities are available for undergraduate students within the Department of Medical Microbiology & Infectious Diseases?
We have a number of labs on the med-micro floor, which includes eight core members, and this number is expected grow in the next five years. The majority of this core conducts HIV research, antibiotic resistance, emerging and re-emerging pathogens in regard to viral infections.

In addition to our core members, we have a vast network of cross-appointed faculty members from a variety of departments, from Immunology to Microbiology at the main campus. We also have members within the Public Health Agency of Canada, Cadham Provincial Labs, and the National Microbiology Lab.

Finding a lab that interests you in our department is definitely possible. The limiting step is the timing for finding available positions whether as a summer, co-op, or graduate student.

This is why we are holding an open house January 9, 2019 from 4 to 6 p.m. in Room 540 BMSB to bring awareness to our department. You will get to know what the Department of Medical Microbiology & Infectious Diseases is doing and which professors are accepting students and at what level. We are also starting, in the new year, a summer undergraduate research award for two undergraduate students valued at $7,000 each, for students to work in a lab in the Department of Medical Microbiology for the summer of 2019. These are just some of the ways, if you are interested in our department, to get a taste of the environment and the types of projects that you could be involved with.

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— Dr. Denice Bay

What value do undergraduate students get from publishing their summer or co-op projects?
The value in publishing as an undergraduate student is that it sets you apart from other students that don't have publications when applying for graduate school or other professional programs. For all of the students that are working in my lab, I don't want them working on anything that is not going to be published whether as a paper on its own or contributing to another publication as this is an important training aspect.

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However, lab research is a two-way street. The student needs to put in enough work that will then lead to a publication, and this will also depend on the lab you are working in. If publishing is something you want to get out of your summer research experience, talk to the supervisor whose lab you are interested in and express this interest.

Keep in mind that not all supervisors take on summer students to contribute to a publication; you may be reorganizing a freezer. So, if publishing is something you are adamant to get out of your summer work, then make that clear and look for a professor that will provide those opportunities.

What do feel it takes to be successful in research?
Everybody is different. If you are excited, engaged, have some level of organization and you're okay with the fact that you will not succeed all time then you will do well in this field.

In addition, having perseverance, the willingness to "dust yourself off", and, most importantly, the ability to recognize an opportunity are essential skills. So, don't give up! Having that willingness and resiliance to want to learn will get you to where you want to be.