Western Faculty Profile: 
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No conflicts of interest declared

Tell us about your job and how microbiology became of interest to you?

I completed my Bachelor of Sciences in Winnipeg at the University of Manitoba where I took over 20 microbiology courses. The lab work introduced during my second-year microbiology courses got me very interested in the field. I then decided to apply, like many students at Western do, to a summer position in a research lab at the University. I worked under a PhD student named Susanne Kohalmi and she is now a biology (genetics) professor at Western – small world! Dr. Kohalmi was an exciting individual to work with, and I think she greatly influenced my decision to pursue a career in academic research.

During my third and fourth years of undergrad, I took microbiology courses of many kinds including environmental microbiology, industrial microbiology, and gene expression. I was fascinated with the topic in general and took all the courses I could. I did my fourth year Honors thesis in a lab looking at fungal genetics.

I chose to do my PhD at Queens after receiving a really nice letter from my eventual supervisor, Dr. Keith Poole. Dr. Poole couldn’t believe how many microbiology courses I had taken and told me I was the perfect candidate to be his first graduate student. For this reason, my advice to all students looking to find a supervisor is to be personable and specific with your interests. During my five years at Queens, I published a number of papers on iron acquisition in Pseudomonas aeruginosa and its relevance to infection and was also involved in the exciting discovery of a drug efflux pump in this bacterium. From there I went on to do my post doctorate at the University of Guelph with one of the leading microbiologists in the country, Dr. Chris Whitfield, working on lipopolysaccharide biosynthesis.

I chose to come to Western in 1998 and started to work with Staphylococcus aureus. Interestingly, before I became a faculty member at Western, I had never even cultured S. aureus. So, if you have a passion for something, don’t let lack of experience stop you!

What made you pick S. aureus?

My postdoctoral research was on Escherichia coli genetics; I didn’t want to stay in that nor did I see myself competing against my postdoctoral supervisor Dr. Chris Whitfield, one of Canada’s leading microbiologists. I decided that I wanted to go back to iron for my own research because I did my PhD in iron acquisition and was knowledgeable in the field. I picked S. aureus at the time because I couldn’t find very many papers in the literature looking at iron acquisition in Staphylococci. I thought it was a young field to get into and gave me the opportunity to identify something new and publish some papers early in my independent faculty career.

What was the most memorable moment of your career?

The most memorable moment of my career was getting my first paper published out of my own lab. Directing my laboratory to research on my own ideas and then getting that acceptance letter stands out as one of the happiest and memorable moments of my career. I also have had several other memorable moments from watching my students thrive and develop their own passion for research.

What advice would you give to an undergraduate student interested in doing research in microbiology?

When you contact someone to say you want to work for them, you need to be prepared. With the internet the way it is now, you have all the resources and the information you need to research virtually anything before you even talk to anybody. I am always thrilled when I meet with a student and they have already researched what I do. They don’t have to know everything about what I do, they don’t even have to understand what I do, but I prefer to see that at least they have tried. To me that shows independence, critical thinking, and the interest level that I’m looking for in someone I want in my laboratory.
I would also recommend not looking into just one person to work under. You should be interested in many different things, and absolutely no one should fault you for saying that you have talked to, or still want to talk to, other faculty members; I actually encourage it. You cannot be interested in only one thing and be single minded, because you will lose out on other opportunities. Broadening your scope will give you an idea of what you are truly interested in, and then you can pursue that.

**In your opinion, what is a topic in microbiology and immunology that needs to be prioritized right now?**

There are several different areas that should be prioritized. Antibiotic resistance is a significant global problem right now, impacting the health of both humans and animals by making infections difficult to treat. Another area that should be prioritized is vaccines because the use of effective vaccines is going to tackle the antibiotic resistance problem by eliminating infections in the first place.

The area that we work on in my lab is the interface of the host-pathogen relationship; it is a highly studied area but there is still so much to be discovered. By understanding bacterial mechanisms of disease causation, we start to determine how we can better treat infections without having to use antibiotics that may not be effective anymore. The study of how bacteria become virulent in a host is critical – you don’t necessarily have to kill a bacterium to have an effective therapeutic that can control a bacterial infection. My research focuses on discovering how bacteria cause infections because it allows us to better understand the interaction between hosts and pathogens.

**To learn more on Dr. Heinrichs’ lab and research, please visit their website:**

https://www.heinrichlab.com/