Western Faculty Profile: Dr. John McCormick

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“As someone who really loves science, if you actually get into the lab and work on something for multiple years, to actually figure things out and how they work ... I find that really satisfying ... to figure out these really complex questions.”

While completing his undergraduate degree at Queen’s University in the Life Sciences program, Dr. McCormick’s journey into microbiology began after his third year as an undergraduate gaining a job with Health Canada in the Bureau of Microbial Hazards in Ottawa. Having sparked his interest in microbiology and bacteriology in particular, he proceeded to do a fourth year Honours thesis project at Queen’s in an immunology lab where he worked on natural killer T-cells. Later, he moved to the University of Alberta to do graduate work involving food microbiology, an experience he considered very application driven. However, while there, Dr. McCormick also developed skills mainly pertaining to molecular biology.

After completing his PhD, Dr. McCormick soon moved to North Carolina State University to

complete a post-doctoral research fellowship. Despite having a good scientific environment, the techniques he were using were very similar to what he had already learned in his PhD studies. He later accepted a second post-doctoral fellowship at the University of Minnesota. Here, he developed an aptitude for infectious disease models, an area of research much closer to medical microbiology. This experience expanded his knowledge in immunology and biochemistry. After remaining in this position for three years, Dr. McCormick made the decision to return to Canada. Moving back to London, Ontario in 2001, he was initially recruited by the Lawson Research Health Institute and moved his laboratory to the University of Western Ontario campus in 2006. When asked how he likes London, he casually replies: “We like the city, good school, strong department, all the resource resources you need are here ... haha, and students are good.”

Dr. McCormick’s laboratory currently investigates the pathogenesis of bacteria that cause very severe disease, as well as their natural life cycle. Detailing further this research focus, he explains:

“There are lots of very dangerous bacterial infections that can happen, but in most cases, bacteria don’t actually cause disease, but actually live among humans.” Investigating primarily the role of bacterial toxins called “superantigens”, he elaborates: “One of the major themes we’ve been working on is that we’re studying these toxins called “superantigens” which are well known to cause a very dangerous disease called the Toxic Shock Syndrome ... We’ve been trying to understand the role of toxins not in Toxic Shock Syndrome but in the life cycle of the bacteria.” A major concept in bacteriology underlying Dr. McCormick’s research is that “as a general rule, infectious agents don’t evolve to kill their hosts. The analogy is similar to burning your house down. If you’re a hypervirulent organism and you kill your host, you have no host to live in.” As he points out, the natural life cycle of these organisms is not actually causing disease. The latest research done in his laboratory has involved *Streptococcus pyogenes*, known for causing strep throat. “One of the interesting things about these organisms is that they only infect humans specifically ... and we’ve figured out the molecular basis explaining why.” Some interesting information uncovered during this research was that a human gene was responsible and, when inserted into mice, allowed the mice to become infected with *S. pyogenes*.

When asked about the greatest academic challenges he faced, the major barriers Dr. McCormick cited were time and funding. “If you’re an academic and you’re actually doing your job, you probably don’t have enough time to do everything you’re supposed to do ... I have a large class, this pretty large research lab and all this administrative stuff that goes on in the background ... Figuring out how to manage your time effectively is a challenge.” Pausing for a breath, he dryly reflects: “I think I’ve figured that out now.” He moves on to remark on the problems regarding funding: “Everyone who is doing research will tell you funding is a problem.”

“We’ve invested a lot of money into training people to where they can run their own independent research program ... but we still face hurdles to get research funded. So we often spend a lot of time writing grants, instead of actually doing the research.” When elaborating on administrative problems, Dr. McCormick noted: “You have to say ‘no’ to some things or you’ll never do the things that you need to do, like teaching and research.”

However, despite the challenges of research, Dr. McCormick shared what he felt were the most rewarding aspects of doing research. He expressed an immense satisfaction in discovering solutions to complex problems after potentially doing years of research as well as sharing discoveries with media and a broader public in general. Another aspect he shared was a human element: “It’s really nice to bring people into the lab and see them develop and get trained from people who are very ‘green’ in research to becoming total research powerhouses.” Comparing his training as a graduate student and the training now, he remarks: “the training students can get now would blow away what I would have been able to do during my graduate training 20 years ago.”

On participating in undergraduate research, Dr. McCormick expresses the problem of resources when accepting new people into the lab. “My advice is when you apply to do research, you have to think about that lab from the other side.” Elaborating further he explains: “What I find will open my eyes is when a student contacts me ... it is important that they have actually looked at what we do ... many students appear to be looking for any position but what I like is someone who is actually interested in the research that we are doing.” Another recommendation he gives for entering research is entrance into the work-study program and summer programs, such as SURF and NSERC, and the possibility of doing an Honours thesis project in the fourth year.

Overall, Dr. McCormick encourages students to express interest in any research they would like to

get involved in. As an academic with many years of research experience, he points out: “Research is fun. It is challenging and hard work, but it gives students the opportunity to learn so many things that you won’t learn sitting in the classroom.”

To read more on Dr. McCormick’s lab and research, please visit his website at:

http://publish.uwo.ca/~jmccorm8/McCormick_Laboratory/Home.html