Health Science Inquiry

SPOTLIGHT ON CAREERS

Interview by Ivana Nad

Dr. Scott McComb

DR. SCOTT McCOMB acquired a BSc in Biopharmaceutical Science (Genomics) from University of Ottawa and his PhD research was in the field of Microbiology and Immunology, at the University of Ottawa. He did his Postdoctoral training at University Children's Hospital Zurich, Switzerland. Through the years, Scott's long term research interest has been in better understanding how and when cells undergo various forms of programmed cell death (apoptosis and necroptosis). After receiving his PhD in Microbiology and Immunology from the University of Ottawa in 2013, he decided to shift his research interest from how programmed cell death shapes the immune system to how cell death is inhibited within cancer cells. He then joined the Leukemia research group at the University Children's Hospital of Zurich (Switzerland), where they developed new genome editing techniques to study the complex ways apoptosis and necroptosis become dysregulated in cells derived from different patients. Today, Scott is a Research Officer at National Research Council, primary national research and technology organization of the Government of Canada, in science and technology research and development.

1. Could you tell me something about your previous activities and education?

I have a BSc in Biopharmaceutical Science (Genomics) from University of Ottawa and my PhD was in Microbiology and Immunology, University of Ottawa, funded by an Ontario Graduate Scholarship. I did my Postdoctoral training at University Children's Hospital in Zurich, Switzerland.

My long-term research interest has been to improve understanding about how and when cells undergo various forms of programmed cell death (apoptosis and necroptosis). After receiving my PhD in Microbiology and Immunology from the University of Ottawa in 2013, I decided to shift my research interest from how programmed cell death shapes the immune system to how cell death is inhibited in cancer cells. I joined the Leukemia Research Group at the University Children's Hospital in Zurich (Switzerland), where we developed new genome editing techniques to study the complex ways apoptosis and necroptosis become dysregulated in cells derived from different patients.

2. Could you describe your current role as a Research Officer at the National Research Council?

I was able to combine my three research interests (immunology, cell death signaling, and cancer biology) within the fast-growing sub-field of Cancer Immunology. My lab at the National Research Council (NRC) Human Health Therapeutics has been applying synthetic biology and genome editing technologies (such as CRISPR) toward developing novel engineered cellular therapies. While chimeric antigen receptor T-cell (CAR-T) therapies are an unprecedented breakthrough for patients with relapsed B-cell leukemia, this as just the first step into a new era of potent and accessible cellular therapies for currently intractable diseases.

3. How did your PhD and Postdoctoral experience prepare you for your current position? How have your interests changed over time?

Today it is essential to have a strong grasp of all of the key elements of adaptive and innate immunology in order to contribute meaningfully to this field. My training in the University of Ottawa BMI department provided me with strong bedrock in the fundamentals of immunology, and working at the University Children's Hospital in Zurich provided excellent exposure to many cutting-edge techniques in cell biology. This is where I was lucky enough to take part in the rapid developments of CRISPR genome editing technology. With a strong grasp of fundamental concepts and openness to emerging technologies, I will position myself and my lab for scientific success.

4. What attracted you to a career at the NRC instead of academia or industry? What skills or traits led you in that direction?

The NRC is a unique organization within the Canadian Federal Government, at the intersection of academia, industry, and government. We try to translate scientific breakthroughs into practical benefits for Canadians. It has always been a dream of mine to be able to translate some of my scientific ideas into real tangible benefits for patients. By working at the NRC, I get to experience the exciting work that is happening both in academia and industry, and work to bridge these two worlds.

5. Could you explain your current job position, your duties or projects, and how this helps you develop new skills? Is your main focus still on research?

As a research officer I am responsible for leading a lab that provides key expertise for NRC realize strategic goals. In my case, my lab has expertise in immune cell assays (such as flow cytometry, cytolytic assays, and animal cancer models). In addition, I am a Project Lead at the NRC, leading work in the area of CAR-T therapies. I coordinate with people inside and outside the NRC to identify potential targets for new CAR-T therapies, and develop novel strategies to try to improve efficacy for these therapies. Day-to-day, my focus is almost 100% on research, and activities including interfacing with other scientists and Postdocs at a high level to devise new experiments. I direct the activities of research assistants, technicians, and students in the lab. I also like to spend some time at the bench if I can, but don't get to do this as much as I'd like.

6. What is your career goal? Do you see your position evolving over time at the NRC?

My medium-term career goal is to work with other talented people to see a made-in-Canada CAR-T therapy developed (at least partly) at NRC for patients in a clinical trial. Beyond this, I would like to help to make engineered cell therapies effective, safe, affordable, and accessible to Canadians.

7. Do you have any advice for graduate students who wish to follow a similar career path outside of academia? Do employers look beyond scholarships, publications and Postdoc experience?

Always try to keep aware of how your research can be applied.

8. What is the future for the NRC? How do you envision the future of healthcare research?

I believe 20 years from now, engineered cell therapies will make up a significant proportion of medical therapies. I can't think of a disease which couldn't be potentially cured with the right engineered cell therapy, no matter how serious and intractable it might seem today. Leveraging genome editing and synthetic biology we can re-engineer cells to bring the right treatment to the right place within the body, at the right time, for the right patient... and with the right engineering, we can grow as many (or as few) of these cells as we need at any time.