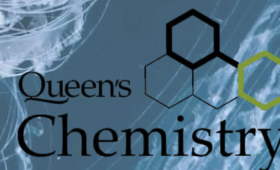


PROF of the MONTH

Queen's Chemistry Departmental Student Council (DSC)

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What aspect of teaching at Queen's is your most favourite?

"I've always enjoyed teaching; I find that it is very rewarding to interact with students and help those who are struggling to better understand the material. Participating in active learning environments is very invigorating and fills me with very positive feelings!"

What are your current research interests?

"My research group is interested in discovering new biologically active molecules (e.g., drugs, antibiotics) that are produced by marine bacteria. Many of the medicines that we see in the clinic today come from natural sources such as these organisms. We are looking to understand both how these complicated molecules are chemically synthesized by bacteria, and how they can be used as medicines."

How/why did you decide to study chemistry?

"I've always been interested in healthcare and how different medicines are discovered. My mother was a high school chemistry teacher before she pursued her PhD when I had nearly completed mine! I remember visiting her in her chemistry lab after school always stimulated my curiosity. I didn't have the best experiences with biology in high school, as the content felt very memorization-heavy and never seemed to catch my attention. However, when I did postdoctoral research with a professor who worked in oceanography, I found myself becoming very invested in biology from a chemical context."

DR. AVENA ROSS



Dr. Avena Ross is a Queen's National Scholar in Chemical Biology and Medicinal Chemistry. She pursued her PhD at the University of Alberta before acting as a postdoctoral research fellow at the Scripps Institution of Oceanography in 2012. In 2015, she joined the Chemistry Department at Queen's University, where she currently teaches and researches marine biosynthesis.



Why or how do you think your field is of importance to industry? What is unique about your field of study that has led you to pursue a career in it?

“I believe that one of the key aspects of my field is its potential as a benefit to humanity—molecules made by bacteria have a high probability of being biologically relevant as they interact with living things. In my opinion, the solution to conquering the increasing risk of antimicrobial resistance, is understanding how bacteria become resistant, as well as discovering new antimicrobial molecules from natural sources (such as bacteria). Pharmaceutical companies today invest into medicines (e.g., anti-cancer drugs) that provide more promising financial benefits than antibiotics. Therefore, academic labs such as mine are essential to maintaining the quality of global healthcare.”

What do you feel is the biggest misconception that people have in regards to what you do? Why do you think is the case?

“I feel that many chemists can be scared of biology—many have had bad experiences where they had to memorize content and asked themselves: ‘Why should I care?’ I find that seeing biology as being just another application of chemistry makes it much more approachable. In my research, being able to work with bacteria is very liberating, because in the case something does not go as planned, it is easy to grow more bacteria and start again. It is a very self-sustaining system!”

What advice do you have to offer to students who are considering a career in research?

“I would tell a student who is unsure about pursuing a research career to try working in different areas (e.g., organic, inorganic, etc.). They may even like to try research in an industrial setting versus in academic environments. It took me 4 different research experiences before I found an area I was both passionate about and good at! I encourage students to not be afraid to take their time in finding the path that is most fulfilling to them.”

Where do you see your field going in the future? What direction is it taking?

“In my research, we hope to one day engineer bacteria that are capable of synthesizing advanced molecules. In today’s industry, making a molecule can be very expensive, time-consuming, and perhaps even wasteful. By teaching bacteria how to introduce different functional groups to form the medicinal molecules that we need, we would be able to do our work on a large-scale and environmentally responsible way.”

The CHEM DSC thanks Dr. Ross for her time in participating in ‘Prof of the Month’.