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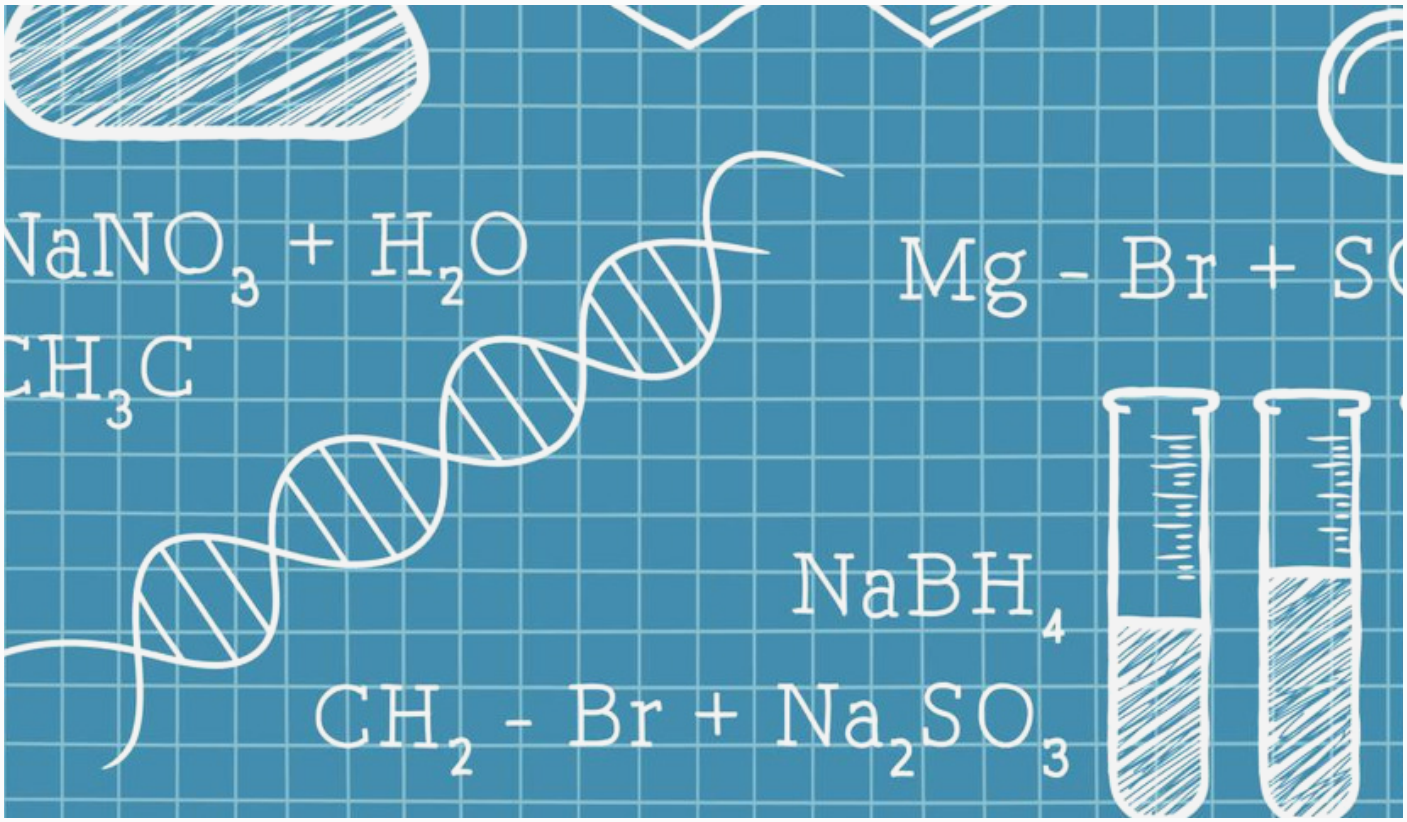
PROF OF THE MONTH

QUEEN'S UNIVERSITY CHEMISTRY



FEATURING:

Dr. Oleschuk, Analytical Chemistry.... pg 02-04

Dr. Stamplecoskie, Inorganic Chemistry.... pg 05-07

DR. RICHARD OLESCHUK

ANALYTICAL CHEMISTRY

What's your favourite aspect of teaching?

" I think it's the interaction with the students. I love when students get a concept, when the light bulb essentially turns on. It's the conversations that I get to have with the students that I love when I teach. I also love being able to use common concepts to describe more complex things, like using cars, children or sports. My grad students refer to them as 'silly analogies'

Dr. Oleschuk is a professor at Queen's University that teaches environmental, analytical and physical chemistry. Before coming to Queen's, he obtained his BScH (1994) and PhD (1998) from the University of Manitoba under Dr. Arthur Chow. In 1998, Dr. Oleschuk was awarded a Natural Sciences and Engineering Research Council Postdoctoral fellowship. He researches microfluidics with the focus on microfluidic Devices constructed from different polymers and integrating them with mass spectrometry.

How did you decide to study chemistry? what who/what were your major influences?

" So interestingly enough, chemistry was actually my third choice. My first choice was physiotherapy, and it turned out that I actually didn't have the marks to get in because it was so competitive. Pharmacology would have followed, but it turned out that it wasn't really my thing. I had always loved chemistry and figuring out how things worked, it was always something I had fun with in high school with my teacher. He was kind of a mad scientist, and his passions really reflected onto me.. At the University of Manitoba, I had a course called instrumental analysis with Dr. Arthur Chow who later became my PhD supervisor and I loved the course so much that I wanted to pursue it more."

DR. RICHARD OLESCHUK

ANALYTICAL CHEMISTRY

What are your current research interests?

"There's an area of chemistry called microfluidics which is essentially the manipulation of small volume fluids. By manipulating these volumes, we're hoping to develop diagnostic tools that help with imaging cancerous tumours and other things"

Why or how do you think your specific field is of importance to the industry?

"Oh cool! Well.. we have a project with SciEX and they basically build mass spectrometers. It's used to measure the molecular weight of ions, and this company has developed a new interface that allows you analyze all sorts of things. We're using this interface to sample air, water, and even tissue samples. Through the open port probe, we're able to analyze many different things. For example, if you had a cup of coffee and you simply just take your fingertip and you touch it, it is able to analyze that you had caffeine metabolite present."

What is unique about your field of study that has led you to pursue a career in it?

"What I like about analytical chemistry is that it's so practical. It just goes back to why I like chemistry so much. You're able to make a coating that sheds water or you can even make an instrument that measures the amount of environmental contaminant. It's absolutely fascinating that you can do pretty much anything. Prior to taking that course with Arthur Chow, I took organic courses and inorganic chemistry courses and it just didn't light my fire like this one did."

What do you feel is the most rewarding aspect of a career in research?

"What I love is that you can have an idea, in the shower or on the way to work right? Well.. you can just come to work and you can just try it out, and that's so much fun. There's so much flexibility in being able to pursue what interests you. Not a lot of jobs let you do that, granted that there's funding but if you're really passionate about something, there's always a way to test it with limitations. I've always told people that I could've made more money if I sold mutual funds or something like that, but it's not nearly as interesting. You're always surrounded by interesting students and faculty members, and there's just a lot of intellectual horsepower. The other cool thing is that if you do discover something, you may be able to commercialize it, and you end up being able to travel which is always a bonus."

DR. RICHARD OLESCHUK

ANALYTICAL CHEMISTRY

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

"A career in research huh? I think it's important that you should try anything. If you have an idea, and you think it's going to work why not give it a try? It all depends what kind of research you're talking about too I guess. Whether its government research, industrial research or academic research. Oh wow, this is a really good question!. I think it's the most important that you do something that you love and really fires you up. I had this talk with my dad a while ago, and he said "you should really love what you do. If you end up doing a job that you're not passionate about, then you just have to do that job x number of hours a day and it's not fulfilling and if you love what you're doing then you're never watching the clock at the end of the day."

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

"I think we have a lot of stereotypes with what chemists do right? If you ask people what they think chemists do and they'll probably say something along the lines of blowing things up and the truth is that we don't blow things up often. There's a real stigma associated with that, and there's also a perception about what our yearly calendar looks like. Even with my parents, I have to constantly tell them that I don't get 4 months off in the summer. We write grant applications, we review things for incoming students, we do research. I think the other misconception is that professors are often disconnected from the rest of society, and that we live in this so-called ivory tower and that we're not very practical. The neat thing about chemistry is that you can pretty much do anything, it's not always like breaking bad"

The Chemistry DSC thanks Dr. Oleschuk for his time in participating in "Prof of the Month"

DR. KEVIN STAMPLECOSKIE

INORGANIC CHEMISTRY

What aspect of teaching is your most favourite?

"I try to make my classroom as dynamic as possible. To hear a student tell me that my teaching helped them understand the material better, is a very gratifying experience. As a professor, being able to teach and interact with students while investing time in my research is the perfect mix of my two passions."

How did you decide to study chemistry? what who/what were your major influences?

"I've been surrounded by many positive influences and mentors during my entire academic career. It was a high school teacher who inspired me to do an undergraduate degree in chemistry at the University of Waterloo. When pursuing my PhD, my experiences working under my supervisor helped to nurture my growing interest in research. To this day, he stands out as my "Academic Father" and biggest inspiration. I feel a strong duty to the people who guided me throughout my career, to contribute to how others see the world of science."

Dr. Stamplecoskie is an Assistant Professor at Queen's University. Before becoming a Postdoctoral Fellow in 2013 at the University of Notre Dame, he completed his undergraduate degree at the University of Waterloo before conducting graduate studies at the University of Ottawa. As a Research Chemist, Dr. S works in the fine tuning of metal nanoclusters and their applications when not teaching in the classroom.

DR. KEVIN STAMPLECOSKIE

INORGANIC CHEMISTRY

What are your current research interests?

"The underlying theme of my research is the way in which light interacts with matter, or photochemistry. In the lab, we deal with metal nanostructures. If you can imagine a small strand of hair that has been cut into eighty-thousand pieces, you might be able to visualize the scale on which my group manipulates these clusters of metal molecules. It is because they are so small that we are able to fine-tune their optical properties. For example, they are fluorescent, and so we use them for biomedical imaging and therapeutics. They are also capable of absorbing sunlight, and can therefore be used to catalyze reactions, or be used to harvest solar energy in solar panel type technologies.

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

"I have a strong background in photochemistry. In my eyes, photochemists such as myself are traditionally physical organic chemists. However, I am finding that there is an ever-growing field emerging, where photochemistry and nanomaterials are coming together. I feel like I am finding a niche for myself, in which I incorporate my knowledge of photochemistry into the fabrication and use of nanoparticles and clusters."

Which of your field's past and or current research has particular applications that you feel contribute to and or benefit society?

"Nanostructure materials can be particularly useful when functionalized a little differently. When we attach different organic molecules to the surface (or none at all) of metal molecules, we can use them as new chemical sensor platforms. A branch of our research is currently trying to tackle the fentanyl crisis. We are aiming to put handheld detectors in the hands of first responders, which are capable of testing someone's blood for fentanyl and its derivatives."

DR. KEVIN STAMPLECOSKIE

INORGANIC CHEMISTRY

What is the most rewarding aspect of a career in research?

"I love being able to conduct my own research. Working at Queen's has allowed me to both satisfy my curiosities and continue to fuel my creatives processes. Being able to have full control over my work – work that contributes to the advancement and betterment of society – is incredibly important to me. I am filled with a sense of pride and accomplishment when I am able to ask the questions that no one asks, and find the answers that no one has."

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

"I can guarantee that there are multiple aspects of practical (laboratory) experience that an aspiring researcher may have not yet considered – aspects which may indeed captivate them! I encourage all students to try opting for real in-lab experiences where they work on projects that interest them. I believe that seeing the fruit of your efforts in the form of a concrete, finalized project is the one of the greatest rewards that a research career has to offer."

What is the biggest misconception that people have in regards tow hat you do? Why do you think this is the case?

"I feel that the biggest misconception students have about what I do is that I have my summers off. In actuality, I do the bulk of my research during the summer. During the Fall and Winter semesters, a great deal of my time is dedicated to teaching and writing new material for my lectures. As such, I find that the summer months really allow me focus on my research projects."

The Chemistry DSC thanks Dr. Stamplecoskie for his time in participating in "Prof of the Month"