FACES OF MASS SPECTROMETRY / Haidy Metwally

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Being Bold and Branching Out

HlyHaidy Metwally began her career in mass spectrometry while working as a quality control analyst in Egypt, the country in which she was born. She now lives in Ontario, Canada, where she works as an application scientist at Sciex focusing on hardware development for mass spectrometers. Outside the lab, Haidy enjoys hiking, cooking, gardening, and spending time with her 10-year-old daughter.

Haidy moved to Canada to pursue a PhD with Lars Konnermann's lab group at the Western University-London-Ontario, where her research focused on electrospray ionization. These were exciting and challenging years for Haidy, particularly because her daughter was born during this time. Balancing being a mother with being a scientist is very important to Haidy. Although this can be difficult, especially if one does not have other family members living nearby to provide support, Haidy is grateful to have found many work environments where people have proven to be considerate and supportive of her position.

After earning her PhD, Haidy accepted a postdoctoral position with Richard Oleschuk's lab group at Queen's University, a job that she recently concluded. Haidy was thrilled to undertake this role because Dr. Oleschuk's group is involved in a diverse range of projects, and this turned out to be an excellent opportunity to explore new fields and acquire new skills. Much of Haidy's work during this time concentrated on imaging mass spec for bacterial cultures. She also worked on projects in collaboration with Kingston General Hospital that aimed to develop new imaging techniques for tissues. Haidy explains that she particularly enjoys researching compounds produced by natural organisms such as fungi, bacteria, and algae because of their extremely dynamic responses to altered sets of conditions.

Dynamism is a quality that Haidy certainly appreciates! Another valued component of her postdoctoral position was the opportunity to collaborate with numerous graduate students on a diverse range of projects. Although this dynamic research environment posed many challenges, Haidy also notes that it helped keep things fresh and interesting. While working at Queen's University, Haidy also acted as a mentor to many of the graduate students in the lab. Elaborating on her approach to these meaningful relationships, Haidy explains it is imperative to recognize that every person is unique. Moreover, she emphasizes the importance of developing strong relationships with mentees that are built around compassion and mutual respect to accomplish the ultimate goal of enabling a mentee to work effectively and independently.

When did you first decide you wanted to pursue a career in science and specifically mass spec?

It started back when I was still living in Egypt and working as a quality control analyst. I came into contact with mass spec at that time, but I was just using it, without going into the details of maintaining it or understanding any of the nitty gritty aspects. So, I was curious about continuing my career in that direction—to try to understand more about the fundamentals of mass spec which would then enable me to develop experiments in a better way.

After moving to Canada, which is where I'm living now, I was looking for a PhD project that involved mass spec fundamentals, and I was lucky to join the lab of Professor Lars Konermann at Western University. Once I started my PhD journey, I got the chance to collaborate with many brilliant graduate and undergraduate students on various projects, in addition to my main focus, which was studying the mechanism of protein charging and supercharging during electrospray ionization. Working in Dr. Konermann's lab gave me the chance to learn

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At the Banff in Alberta. I like to be in nature, even if the temperature is 20 degrees below zero! (Photo courtesy of Haidy Metwally.)

a lot about instrument design and maintenance. My work focused on combining experiments with molecular dynamics simulations, the latter being a completely novel experience for me. Overall, the time that I spent at Dr. Konermann's lab was a rewarding experience that provided me with the confidence to continue learning and hopefully contribute to the development of improved mass spectrometry techniques and instrumentation.

How did you come to your most recent past position with the Richard Oleschuk group at Queen's University, and then your current position as an application scientist at Sciex (Hardware development?

After I finished my PhD, I really wanted to diversify my knowledge in mass spec by exploring new techniques like imaging and ambient ionization mass spectrometry. I decided to communicate with Professor Richard Oleschuk at Queen's University. I was thrilled that he offered me the job as a post-doctoral fellow in his group. My post-doctoral fellowship was a turning point in my career as Dr. Oleschuk's lab is filled with many opportunities like working with different mass spectrometers from different manufacturers along with learning other skills like 3D printing, fabrication, and microfluidics. At Dr. Oleschuk's lab, I had the privilege to interact and work with brilliant graduate students that were like a family to me; they helped me to grow and expand my knowledge. I also had the chance to collaborate into many projects that involved developing methods for tissue imaging to differentiate between malignant and benign tissues, imaging of bacteria to detect the changes in their chemical profile, and detection of opioids in mail packages. After working at Dr. Oleschuk's lab for 4 years, I gained a lot of knowledge about a wide array of MS techniques, and I became more passionate about continuing my career in the developing of mass spectrometers. I applied for a job as a hardware application scientist at Sciex. I recently got accepted for the position, I am so thrilled as working at Sciex will give me the opportunity to work with some of the best scientists in the field and this will help me understand more about mass spectrometers.

What led to your decision to focus on bacterial cultures and imaging mass spec?

Ever since I was a child, I have been curious about nature/environment and read about all living organisms that surrounded us. I can say about myself I am a nature lover. Even when I decided to pursue my Masters in Pharmaceutical sciences, I chose to work on plants. I studied the antihyperglycemic and antihyperlipidemic effects of the extract obtained from Jack fruit leaves. I really like to do research related to nature/environment such as studying the effect of climate change on the chemical profile of plants, fungi, bacteria, and algae. During my post-doctoral fellowship, I got the chance to collaborate with the lab of Dr. Avena Ross at Queen's University. This great opportunity gave me the chance to work with different marine bacteria and environmental fungi species. Generally, samples from either plants, fungi, or bacteria are very dynamic as their secondary metabolites, which are natural products that can change due to many factors. From a mass spec perspective, it is very interesting to monitor the impacts of climate change on the chemical profile of secondary metabolites.

How have you been able to balance being a scientist with being a mom?

I have a 10-year-old daughter, and I really try to strike the right balance between being at work and being at home with her. She was born when I was first starting my PhD, so it wasn't easy creating that balance in the beginning, especially because I didn't have any family living nearby to help me. My spouse has been my rock, and without his help, I would not be able to accomplish any of my goals. On the other side, the work environment is very important—if you work in a good place, with people around you who appreciate what you're going through, that's critical. For example, you try to always be on time, of course, but if something comes up and there are delays, it makes all the difference in the world if your colleagues understand that. I've been lucky to work in many places where people were very considerate and supportive of my situation, which has been a real game-changer.

What excites you about your recent work?

In my previous position as a postdoctoral fellow, I collaborated a lot with graduate students in many projects. Every day, we had a problem we had to solve—and there were always new challenges. We had a very collaborative environment where no one worked on their own, and we all helped each other. I was working on a very diverse set of projects, that ranged from mass spectrometry imaging to fabrication. I prefer not to focus on a single topic and instead having a variety of topics to work with—it keeps everything fresh, challenging, new, and interesting!

What is a major piece of advice that has had an impact on your career?

One big piece of advice I'd give is: Keep reading! If you have a problem, or if you face an issue or challenge, reading is crucial to trying to solve it—and if you still can't find a solution through reading, which I doubt, that's when you need to communicate with those around you, because you can't just be stuck in your own bubble. You really must reach out to people with experience and skills. Always knock on many doors until one of them opens. That's the advice I got when I was first starting out that has really served me well!

How has serving as a mentor for younger scientists helped you to grow in your own science career?

In my career, I have been both a mentor and a mentee. One of the biggest things I have learned from my mentors is that you have to know your mentee very well—you have to know their potential and what they can achieve. And this kind of knowledge tends to come when you actually have a personal connection and a good relationship with the mentee. A lot of times, people will decide to leave a position because there was no one around to support them, listen to them, and show compassion toward them—and that's where knowing your mentee really comes in. There must be mutual respect, because every single one of us is different. As a mentor, you can't always be upset when your mentee makes mistakes; instead, you need to let them learn from those mistakes. So, you really have to be patient and give feedback in a way that is constructive. If you do that, when the time comes, it'll be much easier to achieve their goal, which is releasing the mentee and allowing him or her to work effectively on their own.

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Is there any particular support system or policy improvement that you consider crucial for enhancing diversity in the sciences?

Diversity is very important for the workplace, as it boosts innovation, productivity, and profitability. There are all kinds of training courses available about diversity in the organizations. In the end, though, I think it comes down to human bias. I guess there is not an easy one solution that fits every organization to reach their diversity, equity, and inclusion goals. However, there can be some ways to enhance inclusion and diversity in sciences—like evaluation of the decision-makers and seeing whether they reflect people with different backgrounds, as this will minimize any biases in decisions. Organizations should make diversity, inclusion, and equity a priority by looking at the hiring process, equal pay, and providing safe places to diverse people for employee engagement.

What are some of your interests outside of the lab?

I really enjoy hiking, walking, and going outdoors to new places. I also try to travel as much as I can. And, of course, I love spending time with my daughter! Cooking is another passion of mine, as well as gardening when summer comes. I love doing small craft projects and I like reading old English novels.