INTERVIEW SPOTLIGHT

dr.eric seidlitz

VALUABLE LESSONS FROM THE UNCONVENTIONAL

DR. ERIC SEIDLITZ is a researcher in the department of Pathology & Molecular Medicine at McMaster University. He has a diverse background, with a B.Sc. in Zoology/Botany, a B.A. (first class Honours) degree in Physiological Psychology, a M.Sc. degree in Psychology/Electrophysiology, and a Ph.D. in Physiology and Pharmacology. After working for 8 years at the Sick Children Hospital in Toronto, he joined the Singh Lab at the Cancer Centre in Hamilton in 1998, where he started his research in bone metastasis. Aside from his research, he currently teaches the first year Cellular & Molecular Biology course in the Bachelor of Health Sciences (Honours) program, alongside Dr. P. K. Rangachari.

HELLO DR. SEIDLITZ. FIRST OF ALL, THANK YOU FOR HAVING US ON BEHALF OF THE MEDUCATOR. IT IS A REAL HONOUR TO INTERVIEW YOU AND ASK YOU QUESTIONS ABOUT YOUR RESEARCH AND YOUR FIELD OF INTEREST. CAN YOU PLEASE TELLS US ABOUT THE BACKGROUND OF YOUR EDUCATIONAL JOURNEY, AND HOW YOU ENDED UP AT THE SINGH LAB?

I actually started in Manitoba—that's where I went to high school. I decided at the end of high school I wanted to go to medical school, like almost everybody else that I was going to school with. I went to the University of Manitoba for what they called a "pre-med" program, which was just basic sciences. I really did not get the feel for it at the time, so I decided to finish with a 3-year undergraduate degree; I did my Biology, Botany, and Zoology and then decided at that point that the thing that I liked the most from my undergraduate studies was first year psychology, which was a bit of a unusual thing for me. So,

I decided to go back for another undergraduate degree, which most people usually didn't do. I completed a four-year honours degree in psychology, but was able to cut a whole year out of that because most of my electives were in the first degree. Within six years, I ended up with two undergraduate degrees.

After undergrad, I wanted to do research and I wanted to go into something biology and psychology-related, so I applied to graduate school. Both McMaster and the University of Victoria had accepted me, but the latter offered no money, and money made a big difference at that time. So, I came to Mac; this was during the late 80's, which is a long time ago. I decided to directly start with research. However, I did not have a good interaction with my supervisor, and ended up leaving with a master's degree, which, in that program, wasn't a good thing.

After my master's degree, I worked as a technician for about nine years at Sick Kids Hospital in downtown Toronto. Eventually came along kids, a house, and all of that stuff. I grew tired of going to Toronto every single day and wasting three to five hours on a bus or train, so I decided that I would get a job in Hamilton. That's how I actually connected with the Singh lab. One of our neighbours was their colleague and said that they might be interested in offering a position. I started working at the Singh lab as an animal technician, and kept working there for a good fifteen years or so. This length of time generally marks the end of your academic career, and at this point my position was not going to actually go any further. I was at the top of the pay scale and there was not much I could do.

We came up with the option, kind of out of the blue, that I would go back to school to complete a Ph.D. I was qualified, and I would get all that work plus all the work I would do as a grad student. So I did that for quite a long time—it was almost six years of being a grad student yet again. The year of turning forty, instead of buying a Ferrari, I went to school—but that happens. When I finally graduated, I stuck with the Singh lab for a post-doctoral position, and here I am.

SO DR. SEIDLITZ, COULD YOU TELL US A LITTLE BIT ABOUT YOUR RESEARCH ON BONE METASTASIS AND CANCER-INDUCED BONE PAIN?

Well, when I first started at the lab back in the 90's, we were just working on bone metastasis. It was largely based on how cells interact with bone and how drugs modify that interaction. We did a lot of work on tetracycline derivatives, which were drugs that could actually adhere to the calcium in bone. Calcium would normally get chewed up by cancer cells, resulting in damage to the bone. We did a huge number of experiments on that and found that doxycycline, one of the derivatives of tetracycline, worked very well for knocking down the tumour cells responsible for degrading bone. We actually were able to get that into a clinical trial. It was kind of neat to be able to see us going from the dish, to an animal, and then to a clinical trial. Normally you don't see that kind of thing since the time-scale is so long.

From there, we moved into the stuff that I did for my Ph.D., which was glutamate secretion from cancer cells. This focus was mostly by accident. From my psychology days working with electrophysiology, I was very interested in glutamate receptors, how they store information, and how the communication of this information occurs. I was thinking, "Okay maybe the cancer cells have these receptors and somehow there's going to be a connection that I can grab a hold of and shut them down and stop them from growing." In all the series of experiments that I did, I was trying to get rid of as much glutamate as possible, so that I could then stimulate the glutamate receptors. However, I found that I couldn't get rid of it—it kept coming.

"THAT'S PROBABLY THE MOST IMPORTANT THING IF YOU'RE GOING INTO RESEARCH. THE MORE WIDE-BASED YOU ARE IN YOUR BACKGROUND, THE MORE LIKELY THAT YOU'RE GOING TO SEE THE CONNECTIONS THAT ARE THERE WHEN OTHERS MAY NOT."

There was so much glutamate in there that there was nothing I could do but start measuring levels of it. That's what you do if you have an experiment fail: you end up measuring something. I ended up figuring out that cancer cells dumped out all this glutamate.

Now, glutamate coming out of the cancer cells is just normal biology. These cells are protecting themselves from the oxidative stress induced by chemotherapy drugs. The glutamate is just a waste product of that whole antioxidant process. Now, if you have cancer cells in your lung producing glutamate, there probably will not be a problem. However, if this same glutamate is produced in your bone, it's a huge problem. In the bone, your bone cells all listen to glutamate. As a result, excess glutamate production completely messes up their communication; it's like two cells in the bone are talking to teach other, whispering in English, and someone comes yelling in Japanese. When they can't understand each other, everything goes crazy. We developed this idea for a while, which was the focus of my Ph.D.

We then realized that the most relevant thing for patients with bone cancer was pain, because that's what brings them in to say, "Hey I've got a problem." We realized that the most important signalling molecule in the pain system is glutamate, and we have it in the bone—it's messing up the bone, and so why not mess up the pain system—that's really what we saw as our main focus. This is how it went, all the way from playing around, trying to slow down cancer cells, to getting this focus on glutamate, and then figuring out that glutamate was relevant for certain areas of the body. If you put a tumour in the brain, the glutamate gets into the brain and completely changes how the brain cells function. It's just the same thing, but in the bone. So that's kind of where we went with that whole project.

YOU TEACH THE FIRST YEAR CELLULAR BIOLOGY HEALTH SCIENCES COURSE. CAN YOU TELL US A LITTLE BIT ABOUT WHAT THIS EXPERIENCE HAS BEEN LIKE FOR YOU?

Well, this is my third year teaching it. After I had finished graduate school and was puttering around the lab, I realized that I had some extra time and I wanted to get into teaching. The offer came up that they needed somebody and it seemed to fit with what my interests were. I, not reluctantly, jumped in and said, "OK I'm going to do this." At first, it's a little nerve wracking to see over 200 people looking at you, and it took me a long time the first year to get over that. Now I find it's more energizing than I thought, especially because of the youthful energy that comes exuding from the class. Everybody's interested, everybody's asking questions, and that's very challenging and very rewarding. I really enjoy that. It's not specifically the area that I focused my research on, but it has certainly helped me as well. For some reason after teaching cellular communication, most of my work in the lab has become related to cellular communication. So there's a connection there that's probably more rewarding for me than most of the students in that way.

THANK YOU FOR THAT DR. SEIDLITZ. WHAT ADVICE WOULD YOU GIVE TO ASPIRING UNDERGRADUATE STUDENTS, THINKING OF ENTERING THE FIELD OF RESEARCH?

Well, actually, if you're going to be entering research, the first thing you should do is the stuff that you really enjoy. When I started undergrad, I was doing things for reasons I didn't quite know. For example, I figured out after

completing my first degree that the stuff that I actually wanted to learn were the things that were not offered in the degree. I was in science, but most of the things I wanted were in the faculty of arts, like psychology.

I eventually started taking courses in different areas like Latin and Astronomy. I had Organic Chemistry in the morning, and art courses in the afternoon where I would be drawing nude models and whatever. You wouldn't believe how important that is because you normally don't get the chance to do that in a fairly structured undergraduate program which has very specific courses you have to take. For me, I was able to take the stuff that I wanted to take and I was interested in and thought would be fun.

When I got into graduate school, all of that stuff became useful. Looking at a microscope and drawing what you see—oh, that's easy (however, nowadays you take pictures). Oh, everything's Latin, well I took Latin. There are a lot of things you can gain by doing things that are not in the "mainstream", and that's probably the most important thing if you're going into research. Enrol in a flexible program with many different course options available, because if you narrow in, you're too narrow. Then, when you get into research you have no imagination whatsoever—and I've seen that many times. The more wide-based you are in your background, the more likely that you're going to see the connections that are there when others may not.

ASIDE FROM YOUR WORK IN ACADEMIA, WHAT OTHER INTERESTS OR PASSIONS DO YOU HAVE?

I used to be a pilot. Unfortunately, I can't do that anymore because of my health; I can't pass the medical. When you're over forty, you automatically get put on a list that says you have to do your medical check-up every two years. The first time I did my medical, it took over a year to get the paperwork done. And then I couldn't renew it because of a change in medications and stuff. Regardless, that is still always going to be an interest of mine. I tell my wife that if there's a plane going over, I'm going to go to look at it, and I'm going to go to air shows. I even grew up in an air force family and airplanes are kind of the "thing".

I also have a lot of other hobbies. Photography is one. I do a lot of stain glass. I do all the cooking at home. I would say to do as many things as you can and get good at your hobbies, so that when you're 75, you're going to be very good at it, and you don't have to learn to paint when you're 90.

PHOTOS COURTESY OF DR. SEIDTLIZ

ARTICLE EDITED BY YASMEEN MANSOOR

WE FOUND OUT THAT IN 2012, YOU WENT TREKKING IN ICELAND FOR THE ARTHRITIS SOCIETY. WHAT WAS THAT EXPERIENCE LIKE FOR YOU?

Well, Iceland is a bucket-list kind of place. It's somewhere everyone should go to, and how I ended up going was a bit odd. At the time, I had things I liked to do—I was flying air planes, you know, that was a joy for me. My kids had their own things too; one of them is a scuba diver and one of them is a hockey player. My wife still needed a goal, and so she came up to me one day and said, "This is what I'm going to do—I'm going to raise money for the Arthritis Society," because it was a good cause for our family. She said, "I'm going to Iceland." And I said, "Oh good, when are we going?" She didn't think I would go, because who would go on a 80 km trek across a frozen wasteland with arthritis that was actually getting to a point where I was using a cane? Well, we ended up going together and raising $5 less than our goal of $18,000 just between the two of us. We even had national trainers that trained us with an entire year of hiking, exercise, and all sorts of other things. We went to the trip with 30 other people from all across Canada, and we had a wonderful time. And we got to go to Iceland, which is just an impressive country with very interesting people. That kind of experience was something we probably would never have done otherwise. ■

interviewers

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