INTERVIEW WITH

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Among your many accomplishments in youth science outreach, what do you think has had the most impact?

I'd like to think that we've had some impact on every child and youth who has participated in a science activity that we brought into their classroom or that they've experienced in our lab, but of course that's not true. But many students have reached out years later to let me know how those activities in their classroom inspired them and how it impacted their career trajectories.

Our goal is not to make scientists out of all the youth we engage with, but to strengthen in them an appreciation of how curiosity drives research. And there are so many successes! The grad student volunteers who travel to the remote communities in the far north and come back with a better awareness of the challenges and opportunities in those communities. And students who've made the list of the top 20 under 20 (I'm very proud of them!) and some who are now in medical school.

I think maybe one of my proudest moments was when my first Indigenous trainee became a university faculty member. I think it's hard to predict where the impact will land.

How have approaches to promoting STEM changed?

That's a good question. We have always emphasized two things when designing our activities. First is make it active, and the second is make it relevant. I think for any young person who is wanting to learn, the best thing you can do is to make it an active process where they are part of the process of designing the experiment, testing a hypothesis, learning that process of designing a method that's going to give them clear results and then how to interpret the data. So I think an active process is a much better, more effective teaching mechanism.

Making it relevant and active....that has not changed so much over the years. What has changed, I think, is the who - how to make a science activity relevant to a black student or a First Nation

student can be very different from our traditional methods of teaching. In practical terms, that meant we needed to partner with those communities. I can't even begin to interpret what their experiences have been or how our teaching might be made more relevant to them. And so, we partnered with those communities to make sure that we got the relevance right.

How does the cancer research enterprise benefit from diversity and what approaches are needed to promote diversity?

I think 'how does the cancer research enterprise benefit from diversity' is a really complex question. Cancer research is, of course, so much more than following a recipe, which my brother likes to tease me about, thinking that's what I do every day. But it's much more complex than that. It's about choosing what health challenges need to be addressed, what research directions need our attention and, probably most importantly, consideration of who's going to benefit from the outcomes of that research. If we are thinking only of the people like ourselves in the planning phases of a project, we are sure to miss the opportunities to make that research more impactful to a broader audience.

At its best, diversity benefits cancer research most significantly by fostering innovative thinking. Widening our research approaches enhances the relevance and impact of the studies on the diverse populations as well. We all know that collaborations work really well because everyone sees a problem from their own unique perspective or their own area of expertise. This is no different. It makes sense to ensure that diverse perspectives are at the planning table of designing these experiments in the first place. Now what approaches are needed to promote that diversity? There are so many opportunities, and I think so much of it depends on where you are.

As an example, in the early 2000s, I noticed that the population that seemed to be missing among our science students at the university, and maybe they weren't missing but just not visible, were the Indigenous students. So I set up an Indigenous mentorship program and it ended each year with a science fair. The goal was to introduce the students to the fun of doing scientific research and to presenting your accomplishments to others. That program has been running now for almost 20 years. Next year's our 20th anniversary! And I think it filled a really important gap.

A lot of how to expand diversity depends on who you are and where you are and what opportunities you can create for those students to have your research program be more inclusive.

What are the essential tools in a scientist's communication toolbox?

I think there are three essential tools that a scientist needs in their communication toolbox to be effective. First, you need to have a real desire to have a non-expert understand what you do. You need to be aware of the reason or the importance of having this conversation with them and be

clear on how it will be relevant to them. I think that's the part that most of us tend to miss when we think we're just going to share our science with non-experts.

Second, obviously, is that we need to be able to describe our research in simple language. It's the thing that is probably the hardest for us to do. I honed my skills with my neighbours and family, none of whom are scientists. Even in my discussions with the engineer next door, I have to use language that doesn't have all that science lingo and abbreviations that scientists love to use. So we need to be able to practise talking about our research in simple language so that others can understand it.

And third, and maybe most importantly, we cannot hesitate to convey the passion that we have for our research. People will tend to get excited about our work when we are excited about our work.

In an environment of strong anti-science rhetoric, what advice do you have for the next generation of cancer scientists so that they can make their voices heard?

Social media is full of anti-science rhetoric, and it's become an increasing challenge especially since the pandemic. My advice to those who want to have their voices heard is to use them...be brave, be creative, be consistent, and use every opportunity to share your knowledge and show how it is based on evidence.

I think the only way that we can battle the anti-science rhetoric, the only way we can allow them to win the minds of the public is if we are not there to present the evidence that is counter to their views. It's tough. I'm not big on social media in my own life but I know that my trainees are very much socially engaged and many of them are involved in activities that will encourage others to understand their work.

We also invite people to the lab. We try to broaden the audience that we have so that they can hear about the research that we do. And if they're interested, they can come and see the research that we do. It is a challenge. And I think we need to make sure that our voices are always there with the evidence to overcome the rhetoric that is currently out there that is opposed to science.