

CAN: The brains behind collaborative Canadian neuroscience

As current President, **Dr Freda Miller** is at the helm of The Canadian Association for Neuroscience (CAN), a team of neuroscientists led by a committed board of directors. With the support of **Dr Julie Poupart**, Chief Operating Officer, CAN has shaped and actively impacted neuroscience research not only in Canada, but on a global scale. CAN continues to grow both in terms of membership and reputation, continually showcasing itself as one of the frontier organisations within neuroscience research.

The Canadian Association for Neuroscience (known as CAN) is the largest association of researchers working in all fields of neuroscience in Canada.

The organisation currently has over 1000 members, all of which are active researchers, students, trainees, research associates or principal investigators at research institutes and universities across the country.

CAN's main goal is to ensure that neuroscience research remains one of the greatest research and innovation strengths of Canada. As President of CAN, Dr Freda Miller's role is to provide leadership and direction, launching initiatives that facilitate the involvement and collaboration of CAN's members to promote neuroscience research in Canada. Likewise, as Chief Operating Officer, Dr Julie Poupart's role has been to provide support to Dr Miller, and follow-up for all of CAN's activities.

Both Dr Miller and Dr Poupart recently spoke to *Research Features* about their roles in

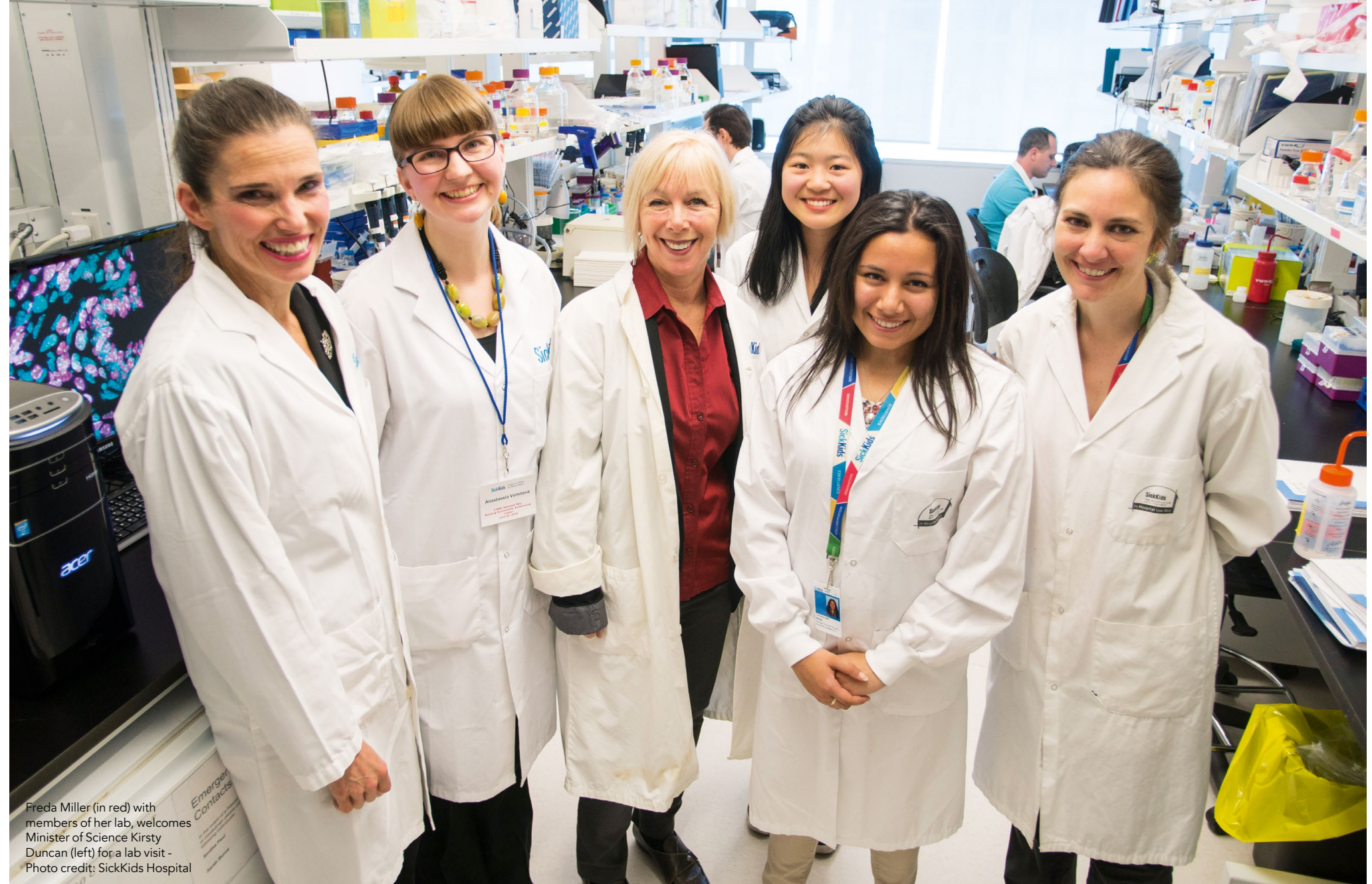
CAN, highlighting why the organisation has become such a pinnacle of neuroscience research since its inception.

Hello Dr Miller and Dr Poupart! Could you tell us about CAN's strategic priorities?

CAN has two major priorities. The first is to provide a forum for interactions amongst all Canadian neuroscientists. In this regard, our major activity is our annual scientific meeting, with an attendance of approximately 1000 individuals. This allows research-focused interactions amongst Canadian neuroscientists and, as such, promotes research excellence and builds community. Our second major priority is to support and increase awareness of the importance of neuroscience research in Canada. To achieve this latter goal, we have identified three major target audiences: Government at all levels, the Media and the General Public.

Regarding this former priority, our most recent activities have included organising a neuroscience luncheon in Ottawa for Members of Parliament that featured

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Freda Miller (in red) with members of her lab, welcomes Minister of Science Kirsty Duncan (left) for a lab visit - Photo credit: SickKids Hospital

research presentations by two highly successful Canadian neuroscientists. We have also encouraged our members to reach out to their MPs and have ourselves written recommendations to the Ministers of Health, Finance and Science on many occasions. It is very important to all our members that the government understand the importance of their support of our research, as one in three Canadians will be affected by a brain or nervous system disease, injury or disorder in their lifetime. As in other countries, our major source of neuroscience research funding is provided by government agencies, such as the Canadian Institutes of Health Research (CIHR), and we work very hard to emphasise the importance of these government funding sources.

Reaching out to the general public and media is also very important to us. We use our website to feature research stories

highlighting recent Canadian neuroscience research in a way that is accessible to non-experts. We also organise public lectures before our annual meeting, and last year, we launched a neuroscience advocacy and promotion contest, to support the grassroots initiatives of our members. We were very impressed by the diversity of activities and amount of dedication our members put into these activities, and were very pleased to give out more awards this year.

According to a recent bibliometric study by the Observatoire des sciences et des technologies, Canada ranks fifth in the world for its publications in neuroscience, with a 30% increase in publications since 1997. What factors do you think have led to this increase in productivity?

Canada has historically been very strong in neuroscience, but one of the issues that we have faced is that we are a very large country

with a relatively small population (30 million total). So, while Canadian scientists in general are highly collaborative and interactive, these interactions have perhaps not flourished to the same extent as they might have if we all lived closer together. In this regard, I think there have been three big changes that have increased our ability to interact, collaborate and pursue the best possible neuroscience research. The first change has been a global one, where new communications technologies have made it increasingly feasible to communicate and collaborate over large distances. This has not only enabled Canadian neuroscientists to interact more closely with each other, but it has also allowed the highly collaborative community we have in Canada to work with other neuroscientists all over the world.

Second, several new funding structures were put into place over the past 15 years or so

that facilitated interdisciplinary collaborative neuroscience in Canada. As one example, the year 2000 saw the formation of the Institute of Neuroscience, Mental Health and Addiction – one of the 13 Canadian Institutes of Health Research. As a second example, a new joint government and philanthropic funding organisation called NeuroScience Canada and then Brain Canada was formed in 2001 to support collaborative Canadian neuroscience grants. There are other important initiatives as well, but rather than list them all, I would like to make the point that it is these kinds of funding initiatives that enabled Canadian neuroscientists to find the money that they needed for cross-Canada neuroscience research efforts.

Finally, although we are admittedly biased, the third relevant change has been the strengthening of the Canadian Association for Neuroscience over this same time period. ►

While CAN has been in existence for several decades, we only had our first annual meeting in 2007. This meeting (and indeed CAN itself) has grown significantly over the past decade to the point where many of us ensure that we attend it every year, not only to hear the latest and greatest in Canadian neuroscience, but also to network with all our Canadian colleagues.

Can you give us some examples of current exciting Canadian neuroscience research projects, and their significance in relation to health and disease?

There are so many, it is hard to choose! We have recently produced a booklet about neuroscience research stories from Canada that highlight the diversity and originality of the research Canadian neuroscientists are doing today. These stories show that current research helps explain how we make memories, what happens when our memory fails (as in Alzheimer's disease), how social interactions affect learning and our mood, how we move and behave, why we feel hunger and thirst, how the nervous system develops and what determines the fate of different cells, among many other things. These stories basically explain what makes us who we are.

The 11th annual CAN-ACN meeting is set to take place in Montreal next month. Could you tell us about this and any other events CAN put on to promote communication among neuroscientists throughout Canada?

The CAN-ACN annual meeting is the most important networking event for the Canadian brain research community. We strive to bring together researchers from all fields of neuroscience research, and we use this event to bring to the forefront not only the exciting research that is being done, but also the issues that are of most concern to our members right now. By featuring the latest in neuroscience research in the country, and simply by bringing our community together, the CAN meeting fosters a collaborative approach amongst our members, and promotes networking.

We also organise a yearly social event at the Society for Neuroscience (SfN) meeting, which is the largest neuroscience meeting in the world, with about 30,000 attendees every year.

Can you tell us more about the CAN Young Investigator Awards? Why were they set up, and what has been their impact?

The CAN Young Investigator awards aim to highlight the research accomplishments of a Canadian neuroscientist at an early stage



Brenda Shanahan and Julie Poupart from the Canadian Association for Neuroscience at the 2016 Canadian Health Research Caucus welcome reception

of his or her career. This is an important recognition as it allows us to put a spotlight on emerging research leaders in Canada. In addition to their prize, winners are featured on our website, and have a chance to present their research to our membership in a plenary lecture at the annual meeting. This is a highly-regarded award – the high level of accomplishment and quality of the candidates we have each year makes choosing the winner difficult for our nominations committee!

Could you tell us a bit about the work of this year's winners?

This year, we had two winners for the 2017 CAN Young Investigator Awards – Dr Tuan Trang from the University of Calgary, and Dr Przemyslaw (Mike) Sapieha, from Université de Montréal.

Dr Trang's work has taken the opioid field in exciting new directions. Opioids, such as

morphine, are amongst the most effective medication for pain, but are associated with debilitating withdrawal symptoms for chronic users. As such, Dr Trang is now leading collaborations with the Calgary Pain Clinic and the Toronto General Hospital in a pilot clinical trial to test the impact of probenecid, an anti-gout drug, on the symptoms of patients undergoing withdrawal from chronic opioid therapy.

Dr Sapieha equally impressed the CAN nominations committee, and his research has high potential impact in preventing blindness in the Canadian population. Both age-related cell deterioration (senescence) and high glucose levels in the blood (as seen in uncontrolled diabetes) can lead to degeneration of the small blood vessels of the retina, leading to ischemic injury, a condition where part of the retina suffers from a lack of nutrients and oxygen. In an elegant series of

studies, Dr Sapieha has deciphered many of the reasons that this injury causes loss of vision. His work has shown that stressed neurons can influence immune responses in the retina by upregulating a series of classical neuron guidance cues, and that this inflammatory response can be deleterious.

Canada is currently in the grip of an opioid crisis. How are the nation's neuroscience researchers helping to manage this issue?

It is important to note that the opioid crisis derives in part from the chronic pain epidemic that exists in Canada. One in five Canadians will suffer from chronic pain in his or her lifetime, a prevalence that increases as the population ages. There are few effective alternatives to opioids such as morphine to treat chronic pain.

In this regard, Canada is recognised for its great expertise in pain research. Canadian researchers have made important discoveries that deepen our understanding of the physiological, genetic, psychological and social determinants of pain. These discoveries open avenues to new ways to treat pain, and prevent the development of chronic pain.

CAN is currently running a statement on the front page of its website, entitled: science as a uniting global force. This states that "science can and must remain a builder of bridges between the peoples of all nations, regardless of differences in political views, religious beliefs or country of origin". Why is it important to CAN to take a stand on this, and how will CAN play its part in ensuring science remains a uniting global force?

It is important for us, as scientists, to have a voice in shaping the priorities of our society. While scientists have perhaps traditionally remained in their laboratories, we think it is important today for our voices to be heard. By taking a stand against divisive forces that aim to prevent the free exchange of ideas, which often takes place at scientific meeting and in lab visits from colleagues around the world, we want to present an alternative, more inclusive vision of the world, and showcase science as an example of how collaboration amongst people of all origins, political views and religious beliefs has allowed science to strive, to the benefit of all of humanity. Scientific discoveries don't stop at borders.

We invited all our members to take part in the March for Science, which took place on Earth Day 2017, April 22. It is an invitation to show

the world (this has become a global event) that people care and believe in science, and that it is important to all of humanity.

How did you both become interested in neuroscience? Let's start with you Dr Miller.

My route was perhaps a little more round-about than most of my colleagues. I am a biochemist/molecular biologist by training, and spent my PhD thinking about DNA structure. However, my PhD laboratory was surrounded by neuroscience labs so, when it came time to pursue my postdoctoral studies, I decided that I wanted to do something more biological, and my colleagues convinced me that neuroscience was the place to be for the upcoming decades.

And how right they were! I went down to La Jolla to the Scripps Research Institute in Floyd Bloom's group, where I was surrounded by neuroanatomists, electrophysiologists, behavioural experts, and even human imagers. I got so excited by everything that was going on around me that I never looked back. And to be honest, I can't imagine having made a better decision, no matter how serendipitously it was made!

Which is your preferred area of neuroscience and why?

As you might have guessed by my answer above, I am a true believer in multidisciplinary neuroscience research. I myself work more at the molecular/cellular level, studying how the brain develops, and whether we can apply the lessons we learn to the damaged or degenerating nervous system. However, I am especially interested in studies aimed at understanding how we build our brain circuitry and how that circuitry provides the substrate for particular behaviours and emotions.

Probably like all neuroscientists, I am fascinated by questions that we really can't answer right now, ranging from the nature of the neural processes responsible for different kinds of genius, all the way to the nature of consciousness itself. To slightly paraphrase Wilder Penfield, "the study of the brain is the study of man himself".

And how about you Dr Poupart – which area of neuroscience do you personally find most interesting and why?

I have not trained as a neuroscientist, so I get to remain a non-specialist. Basic, curiosity-driven research is where the most

interesting new ideas and research avenues often emerge, so it is always interesting to me to hear about new discoveries on the basic mechanism underlying brain function.

How did you first become interested in neuroscience?

I often wonder how someone could not get interested in neuroscience! The brain is the most complex organ we have, and we are only starting to understand how it works. It is fascinating to see how researchers are making discoveries every day that have an impact on so many lives, people who live with a brain disorder or other ailment. And the approaches neuroscientists use today are equally awe-inspiring: for example, while only a decade ago the brain was simply an opaque mass, researchers are now able to make see-through brains, allowing them to see the connections neurons make, thereby identifying important communication networks.

Another example is how scientists are now harnessing the power of high level computational approaches to identify key players in the development of brain disorders, thereby identifying novel drug targets to treat these diseases, that they can then go out and test. Not only that, but there are many more, equally cool, reasons to become interested in neuroscience!

•For more information on any of CAN's excellent events, including the Society for Neuroscience meeting, the CAN-ACN annual meeting or the recent March for Science, please visit their website at www.can-acn.org.



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CAN-ACN
CANADIAN ASSOCIATION FOR NEUROSCIENCE
ASSOCIATION CANADIENNE DES NEUROSCIENCES

We want to present a more inclusive vision of the world, showcasing science as an example of how collaboration amongst people of all origins is to the benefit of all of humanity

