




Commentary

An Indigenous Lens on Priorities for the Canadian Brain Research Strategy

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Introduction

The Canadian Brain Research Strategy (CBRS; www.canadianbrain.ca) is a community-driven initiative bringing together over 30 world-leading neuroscience and mental health institutes and programs in the country. The goals of the initiative are to create a better future for Canadians by responding to the continued need to understand the central nervous system, leverage the country's transdisciplinary strengths in the life sciences and humanities, and situate Canada as a model of leadership in open and ethical brain research. Through the CBRS, Canada has the opportunity – if not imperative – to enable neuroscientists to think outside of traditional western borders, and bring multicultural perspectives and broadened approaches to respectful and meaningful research practices to the table of global initiatives today (www.internationalbraininitiative.org).

Priority-Setting

Indigenous Peoples in Canada (First Nations, Inuit, and Métis) represent 4.9% of the population (<https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/index.cfm?Lang=E>), but only 1.6% of respondents to a recent CBRS survey on equity and inclusivity in Canadian neuroscience self-identified as an Indigenous person of North America (unpublished data, n=764). This underrepresentation solidified the commitment of the CBRS to develop a robust national strategy for brain research that reflects the diversity of Canada's population, integrates Indigenous ways of knowing, and addresses the need for capacity building. In response, the CBRS partnered with

Indigenous leaders in Canada who have research interests in brain and mental health to form an Indigenous Knowledge Holders Group (IKHG). They collaboratively convened a workshop in 2021 to identify ways that Indigenous stakeholders can have an explicit voice in the initiative, weave Indigenous knowledge into the fabric of the CBRS, and support Indigenous brain and mental wellness. Participants were invited from across Canada to engage in a 3-hour workshop involving large group discussions as well as small sharing circles, in a space that was safe for the exchange of knowledge. The 67 attendees included people from all backgrounds and career stages from more than 25 institutions across Canada, nonprofit organizations, and government agencies. They were Indigenous researchers in neuroscience and other fields, non-Indigenous researchers working with Indigenous peoples and communities, and those simply interested in learning and sharing Indigenous perspectives on brain and mental wellness. Multiple notetakers recorded key themes from the discussions. Notes were aggregated, vetted, and finalized with the IKHG and form the basis of this report.

Dr. Christopher Mushquash laid the foundation for the workshop, noting that:

“Indigenous people are not well represented in brain research - brain research is not focused on Indigenous peoples, or researchers have not yet had the conversations about cultural relevance. If we do not find a way to include Indigenous people, the disparities that exist in these research domains, and accessibility to innovations and treatments may only grow”.

During the first arm of the workshop, participants shared their lived experiences and research in a roundtable format. They spoke about neuroscience research in Canada – by Indigenous

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colleagues, researchers focusing on Indigenous populations, those involved in Indigenous care, and people interested in engaging with Indigenous populations. There was a generous breadth of topics: among them, neurotoxic effects of pollution that disproportionately affect Indigenous populations, genetic disorders, artificial intelligence, and biophilic design.

Participants moved into sharing circles led by members of the IKHG in the second arm of the workshop. Here, the focus was on a question that has grounded the CBRS,

“How does the brain learn, adapt, and remember?”

and how should this question be addressed through an Indigenous lens?

While the overall plan of the CBRS leans on a strong legacy of, and commitment to Canadian neuroscience that led to this *a priori* question fundamental to humanity, it did not take into account the vision of Indigenous peoples during its formulation. The discussion focused on if this question ought to be updated to address this gap, and if so, how.

Taken together, the workshop led to the following identified priorities:

1. New partnerships and networks that embrace strength-based approaches and community engagement.
2. Integration of Two-Eyed Seeing¹ in research and education.
3. Increased understanding of the heterogeneity of Indigenous communities and nations.
4. Stronger connections between Indigenous researchers, investigators who conduct Indigenous research, and Indigenous communities.

From Priorities to Action

Partnership

Engagement with Indigenous communities in neuroscience is predominantly unidirectional today. While the doctrine of open discussion with communities about which questions are important to them is codified in OCAP® (<https://fnigc.ca/ocap-training/>), this kind of openness is still largely ignored by researchers.

Finding cross-cultural understandings, translating constructs of interest, and establishing trust remain key challenges. Respect for the breadth of Indigenous knowledge is necessary, ultimately, for appropriately tailored data collection and interventions. One of the four founding pillars of the CBRS – *Address* – could responsibly enable the establishment of a needs-based brain imaging database for Alzheimer’s disease,² for example, recognizing that when doing so the benefits must accrue to the Indigenous communities participating. Through its initiatives, under another pillar – *Apply* – the CBRS can elaborate on how colonialism has suppressed Indigenous language and music and affected cognitive development. The revitalization of Indigenous languages and music is considered to be paramount.

Embracing Indigenous Knowledge, Two-Eyed Seeing

As a consequence of colonialism, Western ways of knowing and learning have held strong in settler-dominated educational spaces, with little to no integration of Indigenous knowledges, perspectives, and pedagogies. Two-eyed seeing,¹ or *Etuaptmumk*, is a guiding principle that was conceived by Mi’kmaw Elder Albert

Marshall in 2004. It speaks to learning to see from one eye with the strengths of Indigenous knowledge and ways of knowing, from the other eye with the strengths of mainstream knowledges and ways of knowing and learning, and to use both eyes together for the benefit of all. Critically, while Two-Eyed Seeing enables the recognition of Indigenous knowledge as a distinct knowledge system alongside Western science, it also involves an integration of the Indigenous and Western perspectives represented without domination or assimilation.

Elder Albert also indicates that Two-Eyed Seeing is the guiding principle for the new consciousness needed to enable integrative, transcultural, or transdisciplinary or collaborative work. For example, cross-cultural neuroethics work by Illes et al.³ with the Tahltan First Nation in northern British Columbia surrounding genetic testing for early-onset familial Alzheimer’s disease provided an example of how consideration of traditional knowledge and biomedical explanations of disease can together provide meaningful engagement with brain health care.

Appreciating the Diversity of Indigenous Communities and Nations

Indigenous people are often clustered together, despite the fact that ways of thinking, knowing, and learning differ extensively between First Nations, Inuit, and Métis peoples across Canada. There are over 630 distinct First Nation communities, representing over 50 Nations and 50 Indigenous languages. Similarly, there are 53 Inuit Nations across the Northern Regions of Canada and almost 600,000 individuals who self-identify as Métis. Given the diversity across the Indigenous population of this land, research questions, and the concerns that drive them, do not look the same across regions. Neuroscience must recognize the diversity of Indigenous populations and apply that respect to tailoring research questions to the specific Indigenous communities involved. Researchers must take the time to understand the unique needs of each community, and its desires, goals, and challenges.

Making Connections

Connectivity, which has emerged as an important theme in systems level neuroscience, actually builds upon Indigenous knowledge that everything in the universe is connected, whether it is the connection between ancestral spirits and the mortal world; the connection between the water, the land, and the animals that live there; and the connections between individuals and the environment. Further, Indigenous knowledge has long known the importance of land-based experiences, and how these experiences change a person and the brain. By understanding the concept of Indigenous connectivity, a critical step is taken towards understanding the desires of Indigenous communities and motivations for decision-making. In some cases, Indigenous community health initiatives use neuroscience to validate and gain acceptance for their work, based on their own ways of knowing. For example, whereas Western ways of knowing may examine mental health disorders such as addictions and post-traumatic stress from a mechanistic point of view, Indigenous ways of knowing may see mental health issues as symptomatic of spirit injury.⁴ As authors, we stress the special responsibility of neuroscientists today to attend to the effects of residential schools that have resulted in transgenerational damaging of the spirit.

From Action to Implementation

The CBRS is invested in taking meaningful action to ensure that Indigenous voices are embedded in every aspect of its strategic plan and implemented throughout its endeavors. Supported by the IKHG, there is an immediate recommendation to update the unifying question offered above to:

“What are the different ways that the brain learns, adapts, and remembers?”

This modification immediately draws upon all four priorities for engaging, understanding, appreciating, and connecting as identified and described above, and takes into consideration historical contraventions of human rights of Indigenous Peoples and the right to health care for all people of Canada.

The challenges to achieve these goals are not trivial, but they are surmountable. Going forward, for example, tokenism cannot be tolerated. Changes must be adopted in neuroscience grant review so that Indigenous experts are better integrated. Nonpaternalistic and nontokenistic education and communication with Indigenous students is vital for early learning across disciplines. Inclusivity of different perspectives is foundational. Bidirectionality of knowledge exchange must be pursued through shared and accessible language. Infrastructures are needed to relieve the pressure on local communities as they hear and respond to calls for engagement. The creation of network environments for Indigenous health researchers and communities is one such mechanism; preclinical research may be another to place to start. Through its own extensive network, CBRS can be a vital force toward pursuing these priorities.

We recognize that it is also incumbent upon the CBRS to reinforce respectful conduct of research in neuroscience across Canada and recognize where Indigenous communities may not want to be involved. To achieve this, CBRS will build on existing guidance to develop best practices for neuroscience engagement with Indigenous communities, including creating space for community members to present issues of importance to higher decision-making bodies such as provincial and federal governments. Where no involvement is the case, the underlying reasons must be considered. It may be that more time for relationship building is required to achieve a trusting, bidirectional, and open dialog so that remedies can be explored.

Outreach and education will continue to evolve as an overall priority for the CBRS. An emphasis on the ways that history has shaped neuroscience and medicine today and on forging connections will further shape these programs. Outreach programs must be designed to ensure that people are not missed and, indeed, even attracted to Canadian neuroscience. Expanded engagement from community stakeholders in the IKHG will also be an important step forward to achieve this goal.

Finally, the CBRS can be a hub for advocacy to connect Indigenous researchers and Indigenous communities, develop initiatives for Indigenous students across Canada, and potentially play a central role in the development of an Indigenous trainee internship program. This kind of advocacy will also be concerned with how Indigenous research and researchers are organized and prioritized, identifying early adopters within the academic and scientific community and enabling them to serve as champions with their colleagues. Postdoctoral fellows who have yet to formulate

their laboratories will be a first focus. And, advocacy does not end here: the CBRS can promote the importance of community-engaged research and articles on Indigenous knowledge in high-impact journals.⁵

Conclusions

The CBRS has undertaken the task of serving as a network of enablement for the Canadian neuroscience community and a connector to outside it with government, funders, and international colleagues and initiatives. The focus on Indigenous perspectives here is only a start. Still, it is made-in-Canada, and authentic to the core. The leadership of the CBRS, jointly with the IKHG, reaffirm their commitment to the goals outlined here that are not only internally facing, but also targets for other nations to consider thoughtfully in their own pursuit of a truly global neuroscience.

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