

CANADIAN BRAIN RESEARCH STRATEGY (CBRS) / STRATÉGIE CANADIENNE DE RECHERCHE SUR LE CERVEAU (SCRC)



RETREAT/RETRAITE: 3-12-2020, Via Zoom

Executive Summary

We convened the Conference of Research Leaders, nominated Early Career Researchers, and invited stakeholders, to discuss CBRS operations, hear from keynote speakers on multidisciplinary neuroscience and open science. We gain their insights on Canadian Neuroscience on the global scale to inform the future programmatic priorities of the CBRS. Key themes discussed for CBRS Years 1 and 2 are commitments to openness, collaboration, diversity, interdisciplinarity, and open science.

Résumé exécutif

Nous avons convié la Conférence des directeurs d'instituts et de programmes de recherche, des chercheurs en début de carrière nommés par ces directeurs et invité des parties prenantes à discuter du fonctionnement de la SCRC, à entendre des conférenciers pléniers discuter de neurosciences multidisciplinaires et de science ouverte. Nous avons recueilli leurs points de vue sur le positionnement des neurosciences canadiennes sur l'échiquier mondial afin d'orienter les priorités programmatiques de la SCRC. Les principaux thèmes abordés pour les années 1 et 2 de la SCRC portent sur des engagements en faveur de l'ouverture, de la collaboration, de la diversité, de l'interdisciplinarité et de la science ouverte.

SUMMARY NOTES (disponible en français sur demande)

Overview of CBRS and progress updates

Our Canadian Brain Research Strategy (CBRS) has been gaining momentum over the past 5 years. The objective at hand is to now refine our vision and priorities to cultivate a Canadian signature that is distinct on the international scene.

Mission

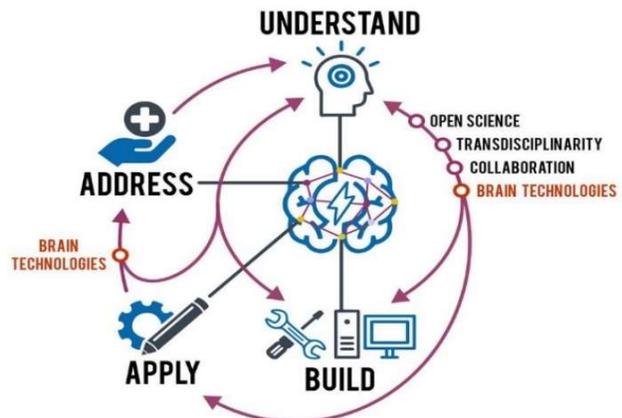
To build on Canada's strengths and current investments in neuroscience to transform neurological and mental health for Canadians.

Vision

Innovative and collaborative brain science driving policy, social, health and economic advancement for Canada and the world.

Pillars of the Strategy

Going from: **Understanding** (e.g., how the brain works) to **Addressing** (e.g., health understandings through prevention and treatment), to **Applying** (e.g., brain research to improve individual brain health, education, and societal and cultural well-being), and to **Building** (e.g., better artificial intelligences via brain-inspired computational approaches).



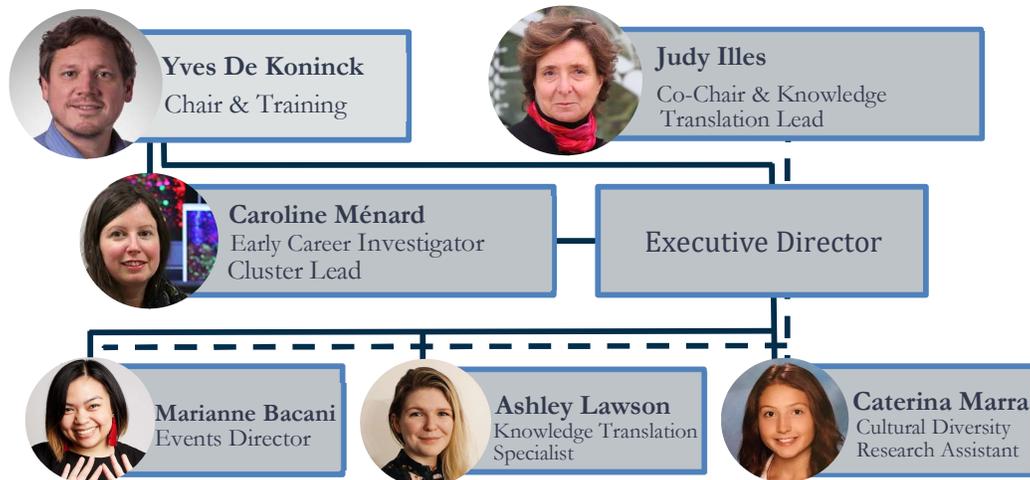
Examples of progress to date

June 2020	Launch of the CBRS Secretariat Website, hiring, identification of priorities
July	Meeting of CBRS Neuroscience Institutes and Program Leaders Consultation on ethical, legal, social priorities for the CBRS
August	Meeting of Secretariat and NHCC Governing Council CBRS Early Career Researchers Workshop 1
September	UBC Neuroscience Grand Rounds CBRS Early Career Researchers Workshop 2 Brainstorming with CAN leadership
October	Equity, Diversity, and Inclusion Meeting
November	Meeting of Secretariat and Pan-Canadian Neurotechnology Ethics Consortium
December	CBRS Retreat Manuscript to CJNS on Early Career Investigators

Through close collaboration and engagement with our stakeholders, the funders collective, and early career researchers, CBRS aims to develop as wide a consensus as possible on the role Canada will play in the international neuroscience community. Our aim is not to replicate other initiatives, but to identify and amplify our strengths.

Canadian Brain Research Secretariat Structure and Year 1 Initiatives

With the support of a CIHR grant, the CBRS has hired a nearly complete Secretariat consisting of a Chair, Co-Chair, Early Career investigator lead, Events Director, Knowledge Translation Specialist, and Cultural Diversity Research Assistant. The hiring of an Executive Director is underway.



Knowledge Translation Initiatives

The CBRS plans to encourage collaboration between various user sectors through Community Engagement, Public Awareness, Media Relations, and Policy Development. With the recent addition of a Knowledge Translation Specialist to the CBRS secretariat, these plans will be carried out in collaboration with our partners. The overall mission of these initiatives is to: *Raise Awareness, Raise Issues, Raise Engagement.*

Equity, Diversity, and Inclusion (EDI) Initiatives

We have a strong commitment to diversity in the CBRS, and our Cultural Diversity Research Assistant is already assessing the diversity of Canada's neuroscience community. The survey is live and was distributed to 30 research leads who are responsible for disseminating it within and across their networks. Further EDI initiatives will be guided by the results and consultation with distinguished advisors in early 2021.

International Brain Initiative (Caroline Montojo, Director of Life Sciences, and Aggie McMahon, IBI Program Specialist, The Kavli Foundation)

The International Brain Initiative arose from a need identified by the global science community to better coordinate large scale brain initiatives. The goals are to maximize impact while simultaneously reduce the potential for redundancy. A few key current areas of focus for the IBI are data sharing, neuroethics, and tool and technology dissemination. Due to the wealth of expertise and collaborative efforts Canada provides, our participation has been integral to the progress of the IBI. The IBI has noted that Canada's strategic thinking for geographically distributed collaboration between brain initiatives can serve as a framework for international approaches. Canada's excellence and history of forefront thinking in neuroethics offers models for public engagement that can be done in concert with local communities and societal values. Further still, Canada contributes expertise on neuroinformatics, data standards and sharing.

Plenary Lecture: Multidisciplinary Research in Neuroscience: A New Approach to Understand and Treat Mood Disorders (Caroline Ménard, PhD, ECR Cluster Leader, Assistant Professor, Laval University)

Dr. Ménard discussed the importance and contributions that a multidisciplinary program can bring to research, using mood disorders as an example. Her research is made possible by multidisciplinary approaches drawn from behavioural, functional, molecular, and imaging studies, and the validation of rodent findings in human samples that provide translational value to basic science projects. Examples of research support:

- CFREF: Canada First Research Excellency Fund (ULaval Sentinel North Initiative)
- NFRF: New Frontiers in Research Fund Exploration Grant
- Brain Canada Foundation: Azrieli Future Leaders in Canadian Brain Research

Assessing the Four Pillars of the CBRS: Summaries of the Break-out Groups

Understand | ECR reporter: Baptiste Lacoste, University of Ottawa

Collaboration and diversity dominated the discussion about Canadian neuroscience in the context of this pillar. Our strengths in collaboration lie in our tight-knit community, our patient-oriented research, community engagement, and involvement of indigenous peoples. Our diversity in trainees and team leaders aids us in being not only collaborative, but also competitive on the global scale. To advance our neuroscience community, a stronger network for students to visit other disciplines, a bridge between clinical and basic research, and collaborations between model systems would improve the translation of our research. We should continue leveraging our dialogue with politicians, community, and media to further the engagement of the community in neuroscience and to in turn bolster funding for both Canadian research and international students.

Address | ECR reporter: Robert Laprairie, University of Saskatchewan

A willingness to collaborate and explore interdisciplinary research were identified as some of the defining features of Canadian neuroscience in the context of the Address pillar. In addition, Canada's philosophy in funding many projects with smaller grants stimulates our diverse research ecosystem when compared to other countries that award larger sums to a select few. It would be beneficial to connect smaller universities that may otherwise become isolated islands, with the implementation of guidelines, rules, and initiatives to facilitate collaboration. There is an inability to share data and samples with ease currently that needs to be addressed. There is also the institutional reluctance regarding commercialization that is hindering translating research from basic to clinical settings. Canadians may also be risk averse in our approach to science, many larger grants are awarded to low-risk endeavors and we need more equal funding opportunities. Research network strategies for open data sharing could be put in place to develop a consolidated framework for our open data policies, open material sharing, and would result in a facilitation of inter-provincial collaborations. Establishing new relationships with pharma could address the issues with collaboration and commercialization, as well as stimulating money and inter-university discussion.

Apply | ECR reporter: Erez Freud, York University

Collaboration is once again considered one of Canada's biggest strengths. Emphasis was especially on the scale of Canada counterbalanced by a small number of research institutes as one of the main motivators for our collaborative practices. Not only are we interdisciplinary but we are also intersectional, connecting to sectors outside of science including industry. One highly discussed theme was the gap between neuroscience and human centred fields such as law or policy making and potential paths to bring the two fields together. A good example of such a path is a training opportunity in the USA where PhD students are training as neuroscientists and policy makers concurrently. It may be beneficial for Canada to adopt a similar program to promote the applied aspects of our research. We need to identify our audience in terms of policy makers, industry, patients, and citizens, and then the CBRS can better tailor its engagement going forward. Other future actions include exploring ways to enable data sharing in a way that is appropriately regulated and ensures privacy in Canada and in an international sense.

Build | ECR reporter: Rosanna Olsen, Rotman Research Institute

Our strengths in neuroimaging, artificial intelligence, and machine learning are unique to Canada and set us apart from other countries. At the same time, the integration between artificial intelligence and neuroscience in Canada is not as strong as what we see in other countries. There are some small initiatives that are working on this integration and perhaps the CBRS could support those efforts. Canada's integration with Indigenous health and Indigenous scholars is simultaneously one of our strengths but also an area in need of improvement. Not many institutions are training experts in computer and neurosciences, this creates a barrier in technological advancements in neuroscience as many computer science experts are lost to industry due to the low financial incentives inherent in academia. The way forward could be to create a new generation of scientists that can navigate both the neuro and tech spheres and creating better financial incentives to retain technological expertise.

Plenary Lecture: Open Science: A Key Accelerator for Neuroscience Discovery (Guy Rouleau, McGill, PhD, MD, OC)

Dr. Rouleau provided an overview of Canada's foray into open science and a discussion of its possibilities as a potential foundation for the Canadian Brain Research Strategy.

Concluding Remarks

CBRS Leads call upon the leaders of neuroscience institutes and programs to encourage discussions and follow up on the ideas brought forward at this first retreat. Reach out as broadly as possible, so we can build a wide consensus among our neuroscience community and reach out to connect with stakeholders.

More meetings will be held to address early items arising from conversations in the retreat, one of which will be a broader scale presentation of the various initiatives that make up our rich Canadian ecosystem. Together as a group, or a collection of different groups, we need to start writing: write op eds, or position papers, and white papers that provide a roadmap and inspiration for our decision-makers to invest in neuroscience.

This meeting highlighted the genuine commitment to patient engagement, openness, diversity, and collaboration. We have also uncovered clear lines of direction for the CBRS that are both methodological and thematic. From a methodological point of view, the notion of spirality, continuous feedback loops of interdisciplinary collaborations, came through all day. We want to focus on this dynamic that consistently builds on itself.

Traditional themes along the lifespan were centered: health and disease, depression, neurodevelopmental disorders, disorders of aging. We also heard somewhat less traditional themes for neuroscience but themes that nonetheless have become deeply integrated into our environment: e.g., COVID, intellectual property protections in neuroscience. We seek to make a change on people, patients, citizens, regulators, lawyers; and all that neuroscience will tell us about what it means to be human, diverse, private, unique, and to be responsible members of societies and communities.

List of Meeting Participants

Secretariat

- Dr. Yves de Koninck, Professor, Chair, Laval University
- Judy Illes, CM, PhD, Professor, Co-Chair, University of British Columbia
- Caroline Ménard, PhD, Associate Professor, ECR Cluster Leader, Assistant Professor, Laval University
- Marianne Bacani, Events Director, University of British Columbia
- Ashley Lawson, Knowledge Translation Specialist, University of British Columbia
- Caterina Marra, Cultural Diversity Research Assistant, University of British Columbia

Conference of Research Leaders

- Chris Anderson, University of Manitoba
- Jaideep Bains, University of Calgary
- Charles Bourque, McGill University
- Francisco Cayabyab, University of Saskatchewan
- Doug Crawford, York University
- Alan Evans, McGill University
- Deanna Groetzinger, Neurological Health Charities Canada
- Michiru Hirasawa, Memorial University
- Yves Joannette, Université de Montréal
- Andre Longtin, University of Ottawa
- Ravi Menon, Western University
- Doug Munoz, Queen's University
- Keith Murai, McGill University and the Research Institute of the McGill University Health Centre
- David Park, Hotchkiss Brain Institute, University of Calgary
- Victor Rafuse, Dalhousie University
- Lynn Raymond, University of British Columbia
- Guy Rouleau, McGill University
- Lisa, Saksida, Western University
- Mike Salter, SickKids / University of Toronto
- Allison Sekuler, Rotman Research Institute, Baycrest (+ UT, McMaster)
- Karun Singh, University Health Network, University of Toronto
- Ruth Slack, University of Ottawa Brain and Mind Research Institute
- Rob Sutherland, Canadian Centre for Behavioural Neuroscience
- Changiz Taghibiglou, University of Saskatchewan
- Ian, Winship attended on behalf of Dr Doug Zochodne, University of Alberta

Stakeholders

- Gillian Akai, Hydrocephalus Canada
- Shauna Beaudoin, Hydrocephalus Canada
- Archana Castelino, Dystonia Medical Research Foundation Canada
- Jennifer Chandler, University of Ottawa
- Chelsea Gabel, McMaster University
- Judy Gargaro, Ontario Neurotrauma Foundation
- Bev Heim-Myers, Neurological Health Charities Canada
- Malcolm King, University of Saskatchewan
- Louis LeBel, Langlois avocats
- Susan Marshall, Brain Tumour Foundation of Canada
- Michelle McDonald, Neurological Health Charities Canada

- Aggie McMahon, The Kavli Foundation
- Caroline Montojo, The Kavli Foundation
- Julie Poupart, Canadian Association for Neuroscience
- Susan Ruyppers, Brain Tumour Foundation of Canada

Early Career Researchers

- Rosemary Bagot, McGill University
- Corey Baron, Western University
- Mark Cembrowski, University of British Columbia
- Katrina Choe, McMaster University
- Annie Ciernia, University of British Columbia
- Jonathon Ditlev, The Hospital for Sick Children
- Chelsea Ekstrand, University of Lethbridge
- Jessica Esseltine, Memorial University
- Galen Wright, University of Manitoba
- Tamara Franklin, Dalhousie University
- Erez Freud, York University
- Nader Ghasemlou, Queen's University
- Mark Hamilton, University of Calgary
- Wei-Hsiang Huang, McGill University
- Baptiste Lacoste, University of Ottawa
- Robert Laprairie, University of Saskatchewan
- Julie Lefebvre, Hospital for Sick Children Research Institute
- Yun Li, SickKids
- Ben Lindsey, University of Manitoba
- Yalda Mohsenzadeh, University of Western Ontario
- Julien Muffat, University of Toronto
- Wilten Nicola, University of Calgary
- Rosanna Olsen, Rotman Research Institute
- Matthew Parsons, Memorial University
- Aaron Phillips, University of Calgary
- Ravi Rungta, University of Montreal
- Scott Ryan, University of Guelph
- Derya Sargin, University of Calgary
- Tabrez Siddiqui, University of Manitoba
- Greg Silasi, University of Ottawa
- Jeff Wammes, Queen's University