Fondation
Brain Canada
Foundation

Making the invisible visible.

Annual Report 2022-2023

THE HIDDEN SECRETS OF THE BRAIN ARE FINALLY BEING BROUGHT TO LIGHT.

For 25 years, Brain Canada's vision has been to understand the brain as a single, complex system. We call this our One Brain approach. We want to see the hidden interconnections between all the processes, neurological disorders, mental illnesses, and brain injuries. Not a collection of siloed diseases. The One Brain approach means that every discovery has the potential to have an impact across a spectrum of brain diseases and disorders. Looking at the brain as one system encourages collaboration, and accelerates our understanding of how the brain works. Together we're maximizing research efforts and magnifying the potential for major breakthroughs.

This report covers a 15-month period from January 1, 2022 to March 31, 2023.

Cover: Dr. Gelareh Zadeh is a professor at the Department of Surgery, University of Toronto, and Head of Neurosurgery at Toronto Western Hospital. This year, Dr. Zadeh was awarded a $4.5 million CCS Breakthrough Team Grant for the project, *Developing a comprehensive strategy to implement predictive and targetable biomarkers of primary and metastatic brain tumours.*

OUR VISION
BOLD SCIENCE
FOR BRAIN HEALTH

OUR MISSION
ACCELERATING,
AMPLIFYING, AND
FUNDING BRAIN RESEARCH
ACROSS CANADA

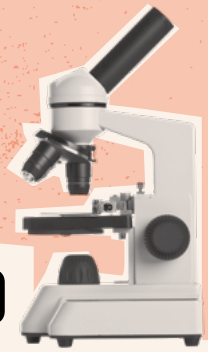
CONTENTS

BY THE NUMBERS

OUR ACTIVITIES, AT A GLANCE.

Brain research is crucial for understanding, treating, and ultimately preventing the more than 1,000 neurological conditions that exist. By investing in bold brain research, we are investing in our overall health and well-being.

Data from January 1, 2022 to March 31, 2023



10 **New** Programs Launched

79 Clinicians & Researchers Who Took Part in Brain Canada-led Peer Review Panels

19 Peer Review Panels Held

215 Active Grants

$39.3 Million Dollars Invested in Research

104 Grants Awarded

6 Student Events Supported

23 Competitions Launched

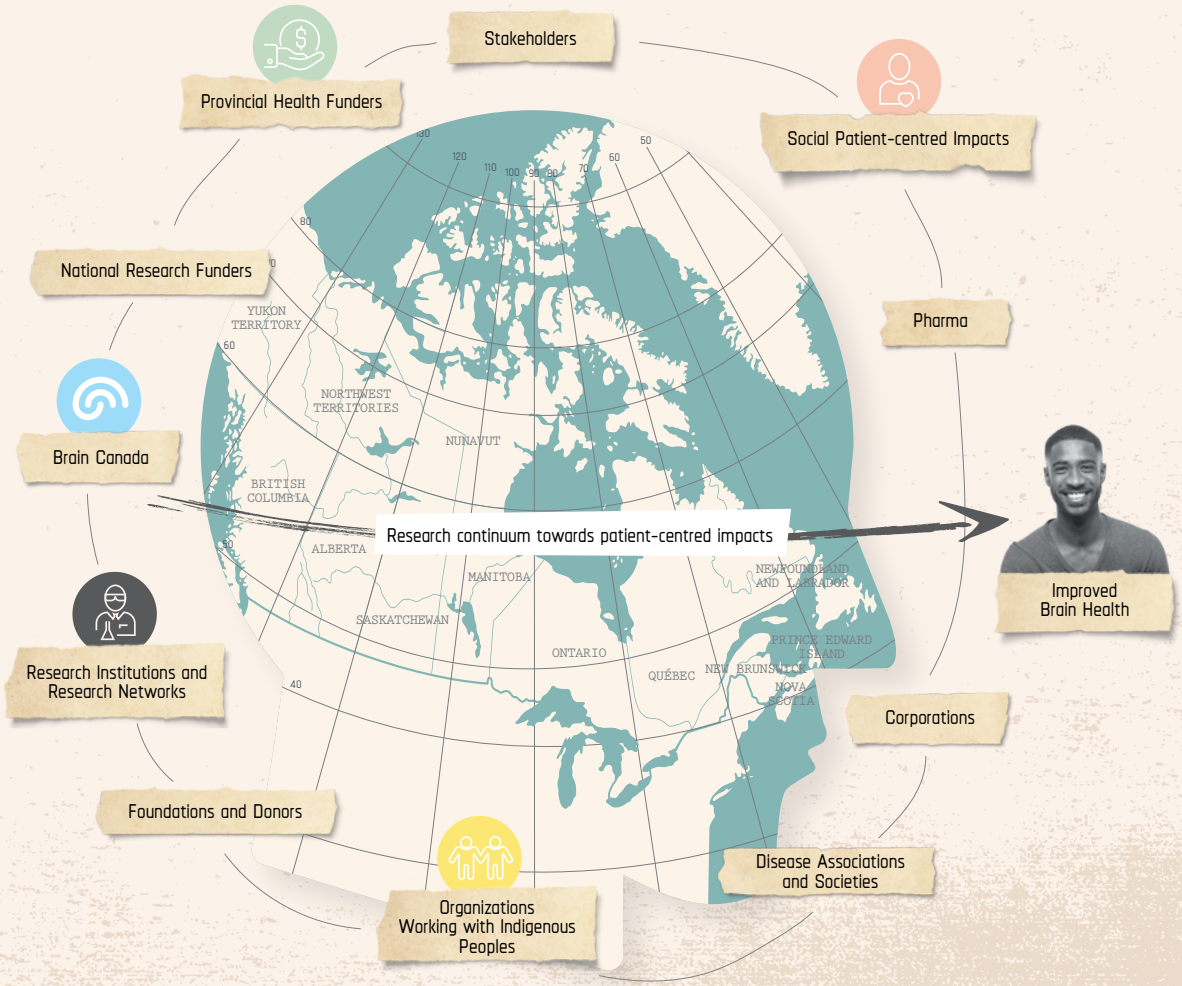
29 Host Institutions

412 Researchers Supported

THE BRAIN RESEARCH ECOSYSTEM

A FULL 360° VIEW

Brain Canada is integral to the entire Canadian brain research ecosystem. We bring together partners and donors to fund hundreds of researchers across the country. We build innovative programs that address the needs of people in Canada and work towards improved brain health for all. Our work is made possible by the Canada Brain Research Fund (CBRF), an innovative arrangement between the Government of Canada (through Health Canada) and Brain Canada Foundation.



MESSAGE FROM THE CHAIR

NAOMI AZRIELI

> Brain Canada is at the very heart of the Canadian brain research ecosystem. Together we drive truly visionary and transformative initiatives.

I am enormously proud of the remarkable work conducted by Brain Canada during this past year – and the quarter century before that. Our organization plays a pivotal role as a funder, convenor, enabler and facilitator of brain science across this country.

More Collaboration. More Projects.
We invested more than $39.3 million in research projects this year. Through strategic collaborations with esteemed partners from the health charity sector, including the Canadian Cancer Society and Heart & Stroke, as well as industry groups like MEDTEQ+ and CQDM, we harnessed the collective power of diverse stakeholders.

We funded ground-breaking initiatives by leveraging major gifts from corporations such as RBC and Bell, along with support from private foundations like the Krembil Foundation. And we accelerated research progress by collaborating with national and international research funders, including the Canadian Institutes of Health Research.

The Power of Diverse Partnerships
Brain Canada is the leading foundation dedicated to advancing neuroscience in this country. We drive tangible, actionable change through our unique and holistic approach which aims to understand all aspects of the brain in health and disease, as well as our funding initiatives which encourage interdisciplinarity and collaboration through more than 100 partnerships.

I extend my heartfelt gratitude to the stakeholders, researchers and donors who have contributed to Brain Canada's success. We are working together to make a lasting impact in the field of neuroscience and provide better health outcomes for people in Canada – and around the world.

Naomi Azrieli, OC, DPhil
Brain Canada Chair

MESSAGE FROM THE CEO

VIVIANE POUPON

Yes, Canada
Canada is one of the leading countries in neuroscience research, consistently ranking in the top five globally. Our country has a strong tradition of excellence in brain research, with world-renowned researchers, cutting-edge facilities, and a vibrant research ecosystem.

As a nation, we have made significant contributions to the field of neuroscience, including the discovery of stem cells, ground-breaking research on Alzheimer's disease, and the development of new technologies for brain imaging and analysis.

A History of Collaboration
Canada's success in neuroscience is due in large part to the collaboration and cooperation between researchers, institutions, and funding agencies. This collaborative approach has enabled us to leverage our resources, share knowledge and expertise, and make significant advances in our understanding of the brain.

As Brain Canada celebrates its 25th anniversary, we are proud to be an integral part of this vibrant and innovative research community. We remain committed to supporting research that can transform the field of brain research and improve the lives of people living in Canada affected by neurological conditions.

The Power of Open Science Platforms
Brain research is complex and multifaceted, and it requires the involvement of experts from multiple fields to make meaningful progress.

> "Brain Canada plays a crucial role overseeing innovative collaborations between researchers, healthcare workers and patients. We enable transformative platforms that keep pace with the ever-changing needs of modern research.

That's why sharing knowledge and sparking interdisciplinary collaborations are critical to enabling new discoveries.

Brain Canada's signature Platform Support Grants Program highlights our commitment to open science and advancing brain research.

Inspired Design. Major Funding.
We launched 23 programs this year, including two new programs to support Black and Indigenous scholars. Through these programs, Brain Canada and its partners are funding transformative research projects that address the evolving needs of the brain research community and ensure that researchers have the tools and resources they need to advance their work.

Viviane Poupon, PhD
Brain Canada President & CEO

OUR TEAM

MADE STRONGER BY MULTIPLE PERSPECTIVES

Brain Canada is committed to building an equitable, diverse, and inclusive organization where all team members have the resources to succeed in their work and grow as professionals, and where our work contributes to better brain health for all people in Canada.

We provide equal opportunities to our employees in a climate of respect and security.

Our commitment to Equity, Diversity and Inclusion (EDI) is reflected in the actions we are taking to diversify our workforce and to foster inclusive environments through our advertising, interviewing, hiring, mentoring and performance review practices. We actively welcome members of underrepresented groups such as women, Indigenous Peoples, persons with disabilities, racialized groups, and LGBTQ2S+ communities.

Alison Palmer, MSc
Lead Science & Impact Writer

Angelina Marchetta
Office Manager-Executive Assistant

Anneliese Poetz, PhD
Senior Program Manager, Knowledge Mobilization (for social innovation)

Anne-Marie Papineau
Director, Legal Affairs & Governance

Barbara Celinska
Director of Development, Toronto Region

Gloria Friedrich
Accountant

Brielle Goulart
Digital Communications & Stewardship Officer

Fiona Sanderson, PhD
Program Manager

Jean-Martin C. Strati, MBA, CPA
Director, Finance & Operations

Julia Segal, PhD
Program Manager

Karen Indig
Administrative Assistant to the National Director of Philanthropy

Kate Shingler
Director, Marketing & Communications

Mario Chartrand, CPA
Chief Financial Officer

Melissa Arauz
Senior Digital Communications & Stewardship Officer

Melissa Russo, MSc
Program Manager

Monica Berger
National Director of Philanthropy

Nadia Martin, PhD
Research & Program Analyst

Sabina Antonescu, MSc
Program Operational Lead

Viviane Poupon, PhD
President & CEO

BOARD OF DIRECTORS

GUIDED BY VISIONARIES

Our Board of Directors volunteers its time and expertise to provide strategic advice and oversight to Brain Canada. The Board is committed to ensuring the Foundation's success as a leading brain research convenor and to supporting its engagement with the brain research community, stakeholders and the broader public.

Patron
The Right Honourable David Johnston
C.C., C.M.M., C.O.M., C.D.
Former Governor General of Canada

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Member, Governance, Nominating & Ethics Committee;
Member, Research Committee;
Member, Sustainability Committee;
Chair & CEO, The Azrieli Foundation (Toronto)

Directors
Shernaz Bamji, PhD
Member, Research Committee;
Associate Director, Djavad Mowafaghian Centre for Brain Health;
Professor, Department of Cellular & Physiological Sciences;
Vice-President elect of the Canadian Association for Neuroscience
Life Sciences Institute, University of British Columbia (Vancouver)

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Member, Sustainability Committee;
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Founding member & Executive President of Precinomics Health Solutions Canada Inc. (Montreal)

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Member, Research Committee;
Krembil Family Chair in Alzheimer's Research, University of Toronto;
Director, Tanz Centre for Research in Neurodegenerative Diseases;
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Ravi Menon, PhD, FCAHS, FRSC
Member, Research Committee;
Professor of Medical Biophysics, Medical Imaging & Psychiatry;
Scientist, Robarts Research Institute;
Principal Investigator, The Brain & Mind Institute;
Co-Scientific Director, BrainsCAN, Western University (London, Ontario)

David S. Park, PhD, FRSC
Chair, Research Committee;
Member, Sustainability Committee;
Director, Hotchkiss Brain Institute;
Lead, UCalgary Brain & Mental Health Research Strategy;
Professor, Departments of Clinical Neurosciences, & Cell Biology & Anatomy, Cumming School of Medicine, University of Calgary (Calgary)

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Franco J. Vaccarino, PhD, FCAHS
Member, Research Committee;
Former President & Vice-Chancellor, Professor of Psychology & Neuroscience, University of Guelph (Guelph)

COMMITTEES

INSIGHTFUL LEADERSHIP

Brain Canada's four volunteer committees are comprised of dedicated individuals who serve in various capacities to advance the mission of the organization. These committees address questions of research, governance, sustainability, and finance. The passionate members of these committees generously contribute their time and wealth of expertise to provide strategic guidance and ensure the long-term sustainability and success of Brain Canada. Their collective efforts and commitment are instrumental to Brain Canada's ability to foster collaboration, drive innovation, and make a meaningful impact in the field of brain research.

Research Committee
Naomi Azrieli
Shernaz Bamji
Graham Collingridge
Edward A. Fon
Sheena Josselyn
Lawrence Korngut
Milka Lukovich
Ravi Menon
David S. Park (Chair)
Viviane Poupon
Franco J. Vaccarino

Sustainability Committee
Naomi Azrieli
Monica Berger
Wayne E. Bossert
France Chrétien-Desmarais (Chair)
Peter P. Dhillon
Darren Edward
Andrea Frossard
Paula Murphy-Ives
Kate Pal
David S. Park
Viviane Poupon

Governance, Nominating and Ethics Committee
Naomi Azrieli
Mark Krembil (Chair)
Viviane Poupon

Audit, Finance, Investment and Risk Management Committee (AFIRM)
Naomi Azrieli
Wayne E. Bossert (Chair)
Mario Chartrand
Mark Krembil
Viviane Poupon

> "Brain Canada is transforming research across the country by accelerating innovation and connecting the scientific community through the scale of its funding, and by building a truly interdisciplinary commitment to brain research.

David S. Park
Brain Canada Research Committee Chair & Director

FUNDING BRILLIANCE

RECOGNIZING CANADIAN BRILLIANCE

Making Our Researchers Shine Bright
Brain Canada shapes its research priorities by engaging with the neuroscience community and bringing research stakeholders together to discuss and advance key brain health issues and opportunities in the health sector. Its flagship programs, which include Team, Platform Support, Capacity Building and Knowledge Mobilization Grants, are designed to fill gaps identified by stakeholders to increase research capacity and strategically advance the prevention, diagnosis, and treatment of brain health conditions.

Innovative Partnerships
The projects we fund are made possible through the Canada Brain Research Fund (CBRF), an innovative arrangement with the Government of Canada, through Health Canada, and Brain Canada. They span many brain research topics, from neurodevelopment to neurodegeneration and everything in between, including brain injury, brain cancer, and mental health.

Rewarding Big Thinking
Through Budgets 2011, 2016, 2019 and a subsequent funding renewal in 2021, the Government of Canada has committed a total of $200 million to Brain Canada through the CBRF to support Canadian neuroscience research with the greatest potential for impact. Brain Canada, the sole recipient of this contribution program, works in collaboration with a range of donors and partners from across the private and charitable sectors to provide competitively awarded funding for research across Canada.

> “We are proud to collaborate with Brain Canada to invest in open science research that will transform the way we understand ALS, conduct clinical trials and develop new treatments.

Tammy Moore
CEO, ALS Canada & Brain Canada Partner

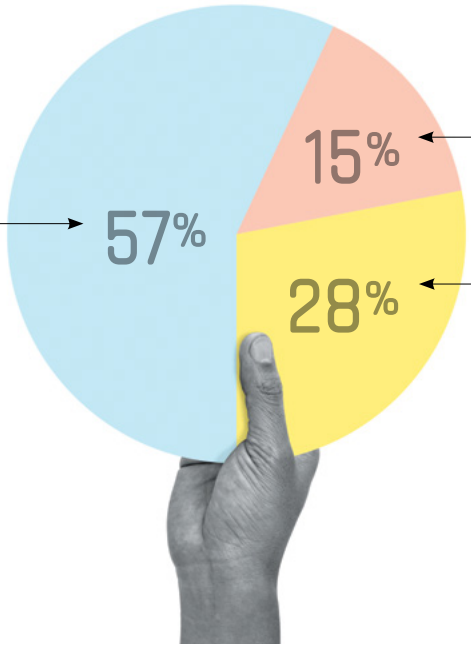
TYPES OF GRANTS

A LOOK AT OUR GRANTS

Projects are funded through four types of grants - Team, Platform Support, Capacity Building, and Knowledge Mobilization. Brain Canada's rigour in its scientific review process gives donors and partners a trusted mechanism to ensure the best and boldest research is funded.

Grants are awarded through open, fair, and transparent processes based on scientific merit, as determined by independent peer review panels.

Funds invested by Type of Grant January 1, 2022 - March 31, 2023



Capacity Building Grants
Invest directly in trainees and early-career researchers

Platform Support Grants
Help develop and/or enhance the capabilities and accessibility of resources essential for research

Team Grants
Bring together scientists from across Canada to advance collaborative research

SEE WHAT WE'VE ACCOMPLISHED

Research Success Stories

Brain Canada is adopting a forward-thinking approach this year to showcase the true impact of the research it enables. Instead of solely highlighting the grants awarded in the current year, we are delving into the medium - and longer-term impacts of investments made in brain research through our programs and partnerships.

By revisiting earlier grants, Brain Canada aims to track the progress and evolution of the research we enable. The focus is not only on the initial findings and outcomes, but also on identifying subsequent funding, new discoveries, and potential breakthroughs that have emerged as a result of the original grants. This approach allows Brain Canada to demonstrate the lasting impact of its investments in brain research, emphasizing the importance of sustained support and a long-term view for funding transformative research.

PLATFORM SUPPORT GRANTS

ACCELERATING BRAIN RESEARCH IN CANADA

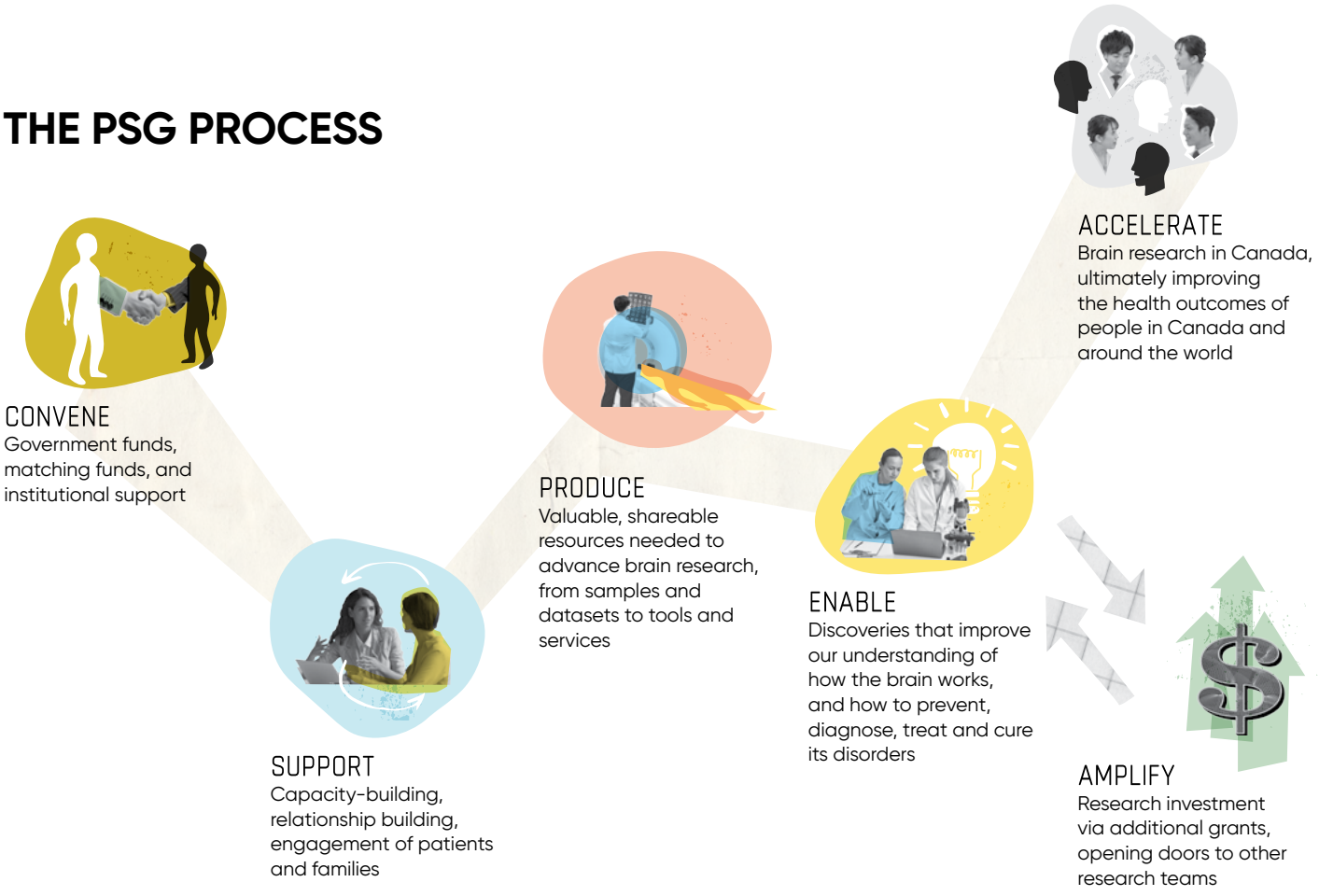
High-impact research in the neurosciences requires access to shared equipment, facilities, services, databases, computing/informatics facilities, patient repositories, and biobanks; collectively referred to as "platforms".

Such platforms are complex, highly sophisticated, and expensive, but are now recognized as important capacity-builders and a cost-effective means to make cutting-edge resources and services available widely—beyond what any researcher could develop on their own.

Platforms also play a critical role in fostering innovation and interdisciplinary collaboration. As such, access to platforms is essential to address the evolving needs of research.

This year's case studies capture the impact of Platform Support Grants (PSG) by illustrating the way they benefit the research community in Canada and globally to drive discovery. Our cohort of focus includes grants that are now complete, awarded in 2014 and 2015 for approximately four years in duration.

THE PSG PROCESS



CASE STUDIES

Support Produce Enable Amplify Accelerate
*HQP = highly qualified personnel

Building the Rick Hansen Alberta Spinal Cord Injury (SCI) Registry

Dr. Chester Ho
University of Alberta

Partners & Donors Convened
Alberta Paraplegic Foundation, Hotchkiss Brain Institute / University of Calgary & University of Alberta

The platform established partnerships between 40 clinical, research, and community SCI stakeholders from urban and rural areas across Alberta.

Together, they collaboratively developed a data collection protocol for the Alberta SCI Registry that includes both clinical data from the medical teams and psychosocial data from community organization, SCI Alberta.

The information collected through the registry highlights the needs of people with an SCI across their lifetime. One of those needs is for improvement in transitions in care.

The team has since obtained a $1 million CIHR grant to study the issue of transitioning from urban SCI centres to rural communities, and design and implement a new system to address it that is translatable to other provinces.

Ultimately, this platform resulted in more appropriate, meaningful data collection for SCI in the province, and informed further research to address an identified issue in the system—transitions in care. The team's ongoing work will inform how to transition people with SCI from inpatient rehabilitation settings to rural communities more successfully.

CBRAIN: Canadian Brain Research and Informatics Platform

Dr. Alan Evans
McGill University

Partners & Donors Convened
McGill University, Genome BC, Djavad Mowafaghian Centre for Brain Health, Vancouver Coastal Health, University of Calgary, Université de Montréal, Dalhousie University, CRIUGM, CIUSSS-CHUS, Baycrest, IUSMQ (CIUSSS-CN), & Hospital for Sick Children

The platform involved a total of 15 HQP* and trainees. It connected researchers at brain imaging centres across Canada and around the world, enhancing their ability to share complex 3D and 4D brain imaging data collected from large multi-centre projects.

CBRAIN developed tools to overcome the large-scale data processing challenges of neuroimaging; this includes 75 datasets and 100 data analysis pipelines.

CBRAIN has 1,500 users in 32 countries, including low-and middle-income countries. Large-scale international teams such as the $260 million NIH-funded Healthy Brain Child Development (HBCD) use CBRAIN to run their projects.

It evolved into the Canadian Open Neuroscience Platform, funded by Brain Canada in 2017, and enabled the EEGNet Platform, funded in 2021. Dr. Evans has also developed a data management company called Lasso Informatics that employs 21 people.

The $9 million HIBALL project, which uses CBRAIN to explore the interface between AI and neuroscience, has yielded 55 publications in the last three years.

Brain Tumour Registry of Canada

Dr. Faith Davis
University of Alberta

Partner Convened
Brain Tumour Foundation of Canada

The platform was established to ensure that every brain tumour in Canada is counted. A total of 20 HQP* and trainees were involved.

The resulting Brain Tumour Registry captured a total of 20,000 cases of brain cancer, including non-malignant tumours which were found to be twice as common as malignant ones.

For the first time, data on brain tumour incidence and survival in Canada were available to clinicians, researchers, advocacy organizations, and patients. The registry data has been used to guide Canadian research, secure government funding, and develop targeted education and support programs.

Dr. Yan Yuan, a co-investigator turned co-lead on the registry, has obtained a $450,000 grant from the Canadian Cancer Society to explore ways that AI can be used to enhance the capture of brain tumours by the cancer registries.

This platform enabled the cancer registry community in Canada to improve the quality of their data, and by doing so, provided a more comprehensive picture of brain tumours in Canada.

A Canadian Biobank and Database for Traumatic Brain Injury (CanTBI)

Dr. Jamie Hutchison
The Hospital for Sick Children

Partners & Donors Convened
Providence Health Care Society, Children's & Women's Health Centre of BC, University of Calgary, Hospital for Sick Children, Ontario Neurotrauma Foundation, CHU Sainte-Justine Foundation, Nova Scotia Health Authority, Genome BC, University of British Columbia, & Djavad Mowafaghian Centre for Brain Health

The platform brought together 46 researchers across seven sites to identify and validate biomarkers for TBI and develop rodent TBI models to study molecular mechanisms. Approximately 100 HQP* and trainees were involved.

A total of 455 patients with TBI and 160 control subjects were engaged in the clinical study, which collected 20,000 samples from patients at different time points after a TBI.

The samples collected have been used to study prognostic biomarkers of TBI. They also enable research into blood proteins and metabolites that are affected and regulated following the TBI.

Platform members built on this work to develop a $6 million proposal to the U.S. National Institutes of Neurological Disorders and Stroke.

The team discovered eight new protein biomarkers and a panel of metabolites associated with long-term outcomes of severe TBI that act as indicators for a patient's recovery. This information is crucial for better tailoring care, rehabilitation interventions, and support services.

2021 PLATFORM SUPPORT GRANT PROGRAM RECIPIENTS

MEET OUR DATA REVOLUTIONARIES

This year, Brain Canada and the Government of Canada announced nine new Platform Support Grants, which together represent an investment of more than $30 million in the Canadian brain research landscape.

> "Investing in projects like these will lead to concrete impacts on brain health in Canada."
>
> The Honourable Jean-Yves Duclos
> Minister of Health

Enabling Neuroscience Research Approaches for Brain, Feelings and Emotions (ENABLE): An Innovative Platform for Clinical Trials in Mood Disorders

Benicio N. Frey, MD, PhD
McMaster University
Grant: $2,402,317

SPRINT: fnirS Platform for Brain Monitoring, Analytics and Data Repository

Emma G. Duerden, PhD
Western University
Grant: $1,277,902

The Neuro's Virtual Integrated Patient Platform

Guy Rouleau, PhD
McGill University – Montreal Neurological Institute
Grant: $5,910,900

MouseTRAP: The Mouse Translational Research Accelerator Platform

Lisa Saksida, PhD
Western University
Grant: $1,425,000

The Canadian Pediatric Imaging Platform (C-PIP): A Platform to Support Research in Child Brain Health

Signe Bray, PhD
University of Calgary
Grant: $5,605,000

CanStroke Recovery Trials: Platform Expansion Proposal

Sean Dukelow, MD, PhD
University of Calgary
Grant: $3,515,000

The Canadian Alzheimer's Prevention Data Repository and Sharing Platform: Accelerating Alzheimer's Disease Research and Treatment in Canada and Beyond

Sylvia Villeneuve, PhD
Douglas Hospital Research Centre
Grant: $2,280,000

The Brain Single Cell Initiative

Trevor Pugh, PhD
University Health Network – Princess Margaret Cancer Centre
Grant: $5,016,000

The SMART Platform for Advancing Foundational and Translational Neuroscience

Vivian K. Mushahwar, PhD
University of Alberta
Grant: $3,060,000

CAPACITY BUILDING GRANTS

SEEKING OUT CANADA'S BEST NEW RESEARCH IDEAS

The next generation of scientists have the talent and ingenuity to move the needle on Canadian brain research – if they have adequate support. Capacity Building Grants invest directly in trainees and early-career researchers to catalyze their potential through salary support, training, research funding and mentorship.

Brain Canada's Future Leaders in Canadian Brain Research Program
Canada's emerging brain researchers are starting their careers just as technology is giving them the tools to explore the deepest secrets of the brain. Their work could unlock cures for anything from depression to Alzheimer's disease to brain injury. This program is anchored by a lead gift from The Azrieli Foundation, with support from The Arrell Family Foundation, the Alvin Segal Family Foundation, the Barry and Laurie Green Family Charitable Trust, and the Erika Legacy Foundation. It was first launched in 2019 and has funded 60 early-career researchers to date.

Future Leaders in Canadian Brain Research
For this competition, a total of 116 candidates from across the country submitted letters of intent which were evaluated by a peer review panel. 47 researchers were subsequently invited to submit full grant applications, with the 20 grant recipients chosen after a second round of peer review.

2021 Grant Recipients:

Azrieli Future Leader in Canadian Brain Research

Philippe Albouy, PhD / Université Laval
Working Memory

Elie Bou Assi, PhD / Université de Montréal
Diagnosing Epilepsy

Lindsay Bodell, PhD / Western University
Eating Disorders

Lindsay Cahill, PhD / Memorial University
Huntington Disease

Carlos Camara-Lemarroy, MD / University of Calgary
Multiple Sclerosis

Michèle Desjardins, PhD / Université Laval
Cognitive Decline in Aging

Catherine Duclos, PhD / Hôpital du Sacré-Cœur de Montréal
Safer Anesthesia

Emma Duerden, PhD / Western University
Fetal & Neonatal Brain Development

Alexandre Fisette, PhD / Université du Québec à Trois-Rivières
Brain Networks & Obesity

Federico Gaiti, PhD / University Health Network
Brain Tumour Biology

Rishi Ganesan, MD / Lawson Health Research Institute & Western University | Delirium in Critically Ill Children

Jiami Guo, PhD / University of Calgary
Cellular Response to Brain Injury

Karl Klein, PhD / University of Calgary
Gene Mutation & Epilepsy

Julien Muffat, PhD / The Hospital for Sick Children
Genetics of Brain Disorders

Shaun Sanders, PhD / University of Guelph
New Treatment for Brain Cancer

Ashlyn Swift-Gallant, PhD / Memorial University
Sex Bias in Autism Spectrum Disorder

Arrell Family Foundation Future Leader in Canadian Brain Research

Annie Ciernia, PhD / The University of British Columbia
Gut-Brain Interaction

Barry and Laurie Green Family Charitable Trust Future Leader in Canadian Brain Research

Aislin Mushquash, PhD / Lakehead University
Accessible Youth Mental Health Support

Erika Legacy Foundation Future Leader in Canadian Brain Research

Christoph Zrenner, PhD / The Centre for Addiction & Mental Health
Brain Stimulation for Brain Disorders

CAPACITY BUILDING GRANTS

THE BODY, THE BRAIN, AND THE CELLS THAT HELP THEM COMMUNICATE

“The Future Leader Grant allowed me to develop this new direction in the lab. It’s a prestigious award that definitely helped me as a new investigator. The cohorts of Future Leaders are truly the future of neuroscience!

Dr. Masha Prager-Khoutorsky

Hungry Messengers

When you fill your stomach with a piece of chocolate cake, your brain receives a signal for that fullness and tells your body to start metabolizing. Thankfully, this signalling isn’t the result of the sugars or fats from the cake flooding your brain; these molecules could do harm to your central nervous system, so the protective blood-brain barrier (BBB) prevents them from making that crossing. The signal for fullness is transmitted via specialized brain cells called tanycytes that cross the BBB and act as important messengers between the body and the brain.

Identifying the Cause

McGill University’s Dr. Masha Prager-Khoutorsky is an expert on tanycyte cells, studying their link to conditions such as obesity, high blood pressure, and diabetes. Using a 2019 Azrieli Future Leader in Canadian Brain Research Grant, Dr. Prager-Khoutorsky identified a strong influencer of tanycyte cells’ ability to communicate signals of fullness to the brain – circadian rhythm.

Missing Signals

As Dr. Prager-Khoutorsky explains, when tanycytes malfunction and can’t do their job, for example when they’re unable to sense leptin, the hormone that gets released into the blood when we eat, the brain doesn’t get the signal it needs to control metabolism. In other words, the brain doesn’t receive a signal of fullness from the body. In the case of obesity, the result is more calories being stored as fat.

Changes to our circadian rhythms may be one of the reasons behind increased rates of obesity.

Disrupted Rhythms

“Yes, we’re eating different foods and that plays a role. But we’ve also experienced significant changes to our circadian rhythms over the last many years. For example, we’re exposed to light for far longer periods of time, and this affects circadian rhythm, which thereby affects metabolism,” says Dr. Prager-Khoutorsky.

Communication Between Cells, and Nations

With an additional $1.5 million in funding through the competitive Joint Canada-Israel Health Research Program, Dr. Prager-Khoutorsky is building on her Brain Canada-funded work to explore yet another factor that influences the ability of tanycytes to communicate between the body and the brain – neuroinflammation caused by bacterial infections. This new project builds on an existing collaboration with Dr. Ruud Buijs based at Universidad Nacional Autónoma de México and includes a new collaborator in Dr. Yoav Livneh from the Weizmann Institute of Science in Israel.

What’s the Impact?

- New research directions
- International collaborations
- $1.5M in additional funding

CAPACITY BUILDING GRANTS

TARGETING SMALL-VESSEL DISEASE IN THE QUEST TO TREAT ALZHEIMER'S DISEASE

> **We're now submitting and receiving grants that build on the science in this area and may take us all the way to clinical trials. It's been tremendous.**
>
> Dr. Walter Swardfager

Interconnected Diseases

Cerebrovascular disease, specifically small vessel disease (SVD), is a prominent risk factor for Alzheimer's and other dementias. It damages the cerebral white matter, and it contributes to shrinkage in certain areas of the brain. In turn, Alzheimer's can cause SVD by contributing to the accumulation of a protein called beta-amyloid in the brain's blood vessels. The damage caused by these brain conditions together affects overall brain function and cognitive decline in aging individuals.

Identifying treatment options targeted to individuals with cerebrovascular disease as an Alzheimer's risk factor requires a better understanding of the biological processes involved.

Identifying the Genes

Tackling this challenge is precisely what Dr. Walter Swardfager from the University of Toronto and Sunnybrook Research Institute set out to accomplish with his International Research Grant Program (IRGP) Alzheimer's Association Research Grant (AARG), co-funded by the Alzheimer's Association and Brain Canada. With this funding support, Dr. Swardfager was able to identify genomic variants that, in the presence of SVD, increase shrinking of the brain.

Targeting a Rogue Enzyme

In their preliminary explorations, Dr. Swardfager and his team discovered that variations in a gene called EPHX2 were linked to damage to the brain's white matter. Single nucleotide polymorphisms, or genetic variations, in the EPHX2 gene affected the volume of brain shrinkage in the presence of SVD across various neurodegenerative diagnoses. This discovery suggests that the enzyme produced by the EPHX2 gene might be targeted to protect against SVD-related brain changes and cognitive decline in individuals with or at risk for Alzheimer's.

Because of this finding and with leveraged funding from his AARG, Dr. Swardfager's team went on to show that the products of the EPHX2 enzyme were elevated in the blood of people with SVD. Based on this evidence, Dr. Swardfager prepares to soon test whether inhibiting the enzyme encoded by EPHX2 prevents SVD-related cognitive impairments clinically. He hopes that the approach might ultimately prevent or slow progression to dementia.

Fostering a Talent Pipeline

"Establishing this dataset has increased the productivity of my lab and provided training opportunities to 18 under-graduate and graduate students," says Dr. Swardfager. "We're now submitting and receiving grants that build on the science in this area and may take us all the way to clinical trials. It's been tremendous."

Funded in 2017, two years into his assistant professorship in the Department of Pharmacology & Toxicology at the University of Toronto, this grant contributed significantly to growing Dr. Swardfager's academic career and lab.

"Grants like the AARG that support early-career researchers, and seed funding from organizations like Brain Canada and the Alzheimer's Association, are essential. This was the first international research grant I received. I cannot overstate the importance of this funding and the number of doors it has opened for my trainees and for me," shares Dr. Swardfager, who is now a Canada Research Chair.

What's the Impact?

- Fostering a talent pipeline
- Providing training opportunities to 18 students

TEAM GRANTS

WORKING ACROSS DISCIPLINES TO SEE BETTER, FASTER RESULTS.

Ground-breaking discoveries in brain health research never happen alone – they take bright minds working across disciplines and institutions. Our Team Grants bring together scientists from across Canada to advance collaborative research on the brain.

This year, nine Discovery Grants were funded through the ALS Society of Canada and Brain Canada partnership, with support from the Dr. Jean-Pierre Canuel Fund-SLA Québec. These projects are advancing the ALS research landscape and improving outcomes for people living with this rare brain disease.

2022 Discovery Grants

Can this routine and inexpensive procedure have a neuroprotective effect in ALS?
Dr. Carlos Camara-Lemarroy at the University of Calgary, in collaboration with Dr. Minh Dang Nguyen at the University of Calgary, and Dr. Deepak Kaushik at the Memorial University of Newfoundland, awarded **$125,000**

Could this new mouse model help to understand the potential role of retroviruses in ALS and lead to new treatments?
Dr. Renée Douville at the University of Winnipeg, in collaboration with Dr. Jody Haigh at the University of Manitoba, and Dr. Domenico Di Curzio at St. Boniface Hospital Albrechtsen Research Centre, awarded **$125,000**

Could this new 3D cell culture model help researchers better predict disease progression in ALS?
Dr. Thomas M. Durcan at The Neuro (Montreal Neurological Institute-Hospital), in collaboration with Dr. Yasser Iturria-Medina at McGill University, awarded **$125,000**

Could protecting the axon represent a promising treatment strategy for ALS?
In partnership with the Dr. Jean-Pierre Canuel Fund-SLA Québec and Dr. Alex Parker at CHUM Research Centre (CRCHUM), Université de Montréal, in collaboration with Dr. Gary Armstrong at McGill University, awarded **$300,000**

Could the study of neuromuscular junction proteins aid in the development of essential biomarkers?
Dr. Richard Robitaille at Université de Montréal, in collaboration with Dr. Danielle Arbour and Dr. Roberta Piovesana at Université de Montréal, and Dr. Robert Bowser at the Barrow Neurological Institute, awarded **$300,000**

Could improving the mechanisms of toxic protein disposal in motor neurons become a future treatment strategy?
Dr. Gary S. Shaw at Western University, in collaboration with Dr. Martin Duennwald at Western University, and Dr. Elizabeth Meiering at the University of Waterloo, awarded **$125,000**

Can computational methods aid in the design of key antibodies for the diagnosis and treatment of ALS?
Dr. Maria Stepanova, in collaboration with Dr. Holger Wille at the University of Alberta, awarded **$125,000**

What role does its sister protein play when restoring G3BP1 levels as a potential ALS treatment strategy?
Dr. Christine Vande Velde at CHUM Research Centre (CRCHUM), Université de Montréal, in collaboration with Dr. Marlene Oeffinger at Institut de recherches cliniques de Montréal (IRCM), awarded **$125,000**

Will this new way of looking at certain protective proteins better explain their role in ALS?
Dr. Maria Vera Ugalde, in collaboration with Dr. Heather D. Durham at McGill University, awarded **$125,000**

TEAM GRANTS

TEAM DISCOVERS MARKERS FOR SISTER DISEASE TO ALZHEIMER'S

> **I am grateful to Brain Canada for recognizing the need to look at complimentary and novel approaches to better understand cognitive decline in a way that allows us to look beyond Alzheimer's disease in a silo.**
>
> Dr. Eric Smith

Seeing More Clearly

Dr. Eric Smith from the University of Calgary and his team have identified blood and brain imaging markers to distinguish between Alzheimer's disease and a lesser-known contributor to cognitive decline called cerebral amyloid angiopathy (CAA).

His research was made possible thanks to funding from Brain Canada, through a 2015 Multi-Investigator Research Initiative (MIRI) Team Grant.

Better Diagnosis for Better Treatment

"This funding from Brain Canada was critical in allowing us to identify brain imaging and blood markers for an understudied cause of cognitive decline called cerebral amyloid angiopathy," says Dr. Smith. "It allowed us to shine a light on less common contributors to dementia that are now more important than ever to consider when we think about individualized treatment options."

Helping Patients, and Family Doctors

Cerebral amyloid angiopathy, or CAA, accounts for 7% of dementia risk and 20% of all hemorrhagic strokes. It is considered a sister disease of Alzheimer's disease (AD) but one that is not well known to the general public or family physicians as it is often difficult to distinguish from other causes of cognitive decline.

To better understand the commonalities and distinctions between these two diseases, Dr. Smith and collaborators sought to identify markers for CAA in biofluids and brain images.

Pioneering a Whole New Technique

They discovered a new test that can detect beta-amyloid in the blood using white blood cells that ingest beta-amyloid in their journey through our bodies' blood vessels.

Dr. Peter Stys from the University of Calgary, working with Dr. Smith and his colleagues, developed a technique called AmiraSpec™ that uses highly sensitive probes in blood samples to detect aggregates of beta-amyloid ingested by white blood cells. With leveraged funding from the Weston Brain Institute and a new collaboration with McGill University, Dr. Stys and Dr. Smith are expanding this work. The AmiraSpec™ technology, which has been patented, is now being developed for a broader range of other diseases that are characterized by misfolded proteins, including Parkinson's disease and multiple sclerosis.

Discovery upon Discovery

Another discovery showed that measuring injury to the brain's white matter, the reduced ability of brain regions to receive higher blood flow when needed, and brain shrinkage are important imaging markers of CAA in the brain. A recent study by Dr. Smith and colleagues showed that these markers account for 50% of the effect CAA has on cognition.

What's the Impact?

- Fuelling discovery
- Generating intellectual property
- Team patents new detection approach

TEAM GRANTS

CAN WE MAP THE BRAIN TO PREDICT WHO WILL DEVELOP SERIOUS MENTAL ILLNESS?

> **If you can predict who will transition and develop serious mental illness, you can intervene earlier and maybe prevent it in the ideal circumstance.**
>
> Dr. Catherine Lebel

First-of-its-kind Study

Brain imaging expert Dr. Catherine Lebel at the University of Calgary has published a first-of-its-kind study focused on youth at risk of serious mental illnesses, including schizophrenia, bipolar disorder, and major depressive disorder. The study is part of a larger 2014 Multi-Investigator Research Initiative (MIRI) led by psychiatrist Dr. Jean Addington at the University of Calgary and funded by Brain Canada and the Hotchkiss Brain Institute.

"We wanted to figure out – who's going to need support? And can we get them that support early?" explains Dr. Lebel.

All Types of Young Brains

The first step of the project classified youth based on clinical assessments of their risk for serious mental illness and their symptoms. Groups included: healthy controls with no personal or family history of mental illness, people who were healthy but carried a familial risk, people with mild symptoms, people experiencing more significant symptoms but without a diagnosis, and people who received a diagnosis during the study.

The team then collected brain imaging data from these five distinct groups of youth at baseline and after one year to determine whether the brain showed signs of transition to serious mental illness.

Seeing Brain Connections

Dr. Lebel and her team used the imaging data to generate "connectomes", which are essentially maps that illustrate how the brain is functioning as a network. The connectomes map the imaging data for both structural connectivity, which is how white matter is connected within the brain, and functional connectivity, which is how different areas of the brain work together. Using a machine learning model, the team then sought to confirm whether any brain features were distinct across the five categories of youth.

"We looked at the question in a number of ways and we didn't find any major brain differences between youth who do and youth who don't yet have – but are at risk for – a serious mental illness," explains Dr. Lebel. "Maybe there are no differences to be found. But there is still a lot to be learned from an experiment like this."

Full Spectrum Approach

This approach could serve as a new framework for future studies seeking to predict serious mental illness. Studies of this kind often look at one illness at a time, but Dr. Lebel and her team looked at the full spectrum of mental illness. This choice reflects increasing consensus in the scientific community that in their early stages, serious mental illnesses are often indistinguishable from one another.

Helping Youth and Parents

Dr. Lebel is the recipient of a Bell Let's Talk-Brain Canada Mental Health Research Program grant where she leads a project focused on improving mental health and parenting through app-based intervention. She is also the recipient of the prestigious 2022 Steacie Prize, awarded annually to a young investigator for outstanding scientific research carried out in Canada.

What's the Impact?

- Pioneering new approaches
- National recognition

TEAM GRANTS

BOLD IDEA GETS BRAIN CANADA BACKING, FOLLOWED BY BIG INVESTMENT.

> **Thanks to Brain Canada investment, we're officially liberated from the idea of studying one gene at a time.**
>
> Dr. Sébastien Jacquemont

Some Genes Put Kids at Higher Risk
Dr. Sébastien Jacquemont was awarded a 2015 Brain Canada Multi-Investigator Research Initiative (MIRI) Team Grant. A medical geneticist and researcher, Dr. Jacquemont seeks to understand why certain genetic profiles put children at a higher risk for autism, schizophrenia, or other neuropsychiatric conditions. This knowledge is key to establishing early interventions and developing tailored therapies.

Creating a Better Test Group
Dr. Jacquemont observed that existing datasets of cognitive, behavioural, and brain measures lacked children with mutations associated with a high risk for neurodevelopmental conditions, who he was often seeing in the clinic. He wanted to develop a cohort of families carrying different genetic mutations associated with these conditions so he could test whether different mutations affecting the same biological function would lead to similar neuropsychiatric symptoms.

Go Big. Go Bold.
Dr. Jacquemont and his team saw value in studying the whole array of mutations at once to assess their influence on the brain and behaviour characteristics. A decade ago, this was a very bold idea. "'Why would you do that?' I was asked. 'It's not going to work. Why not continue to study one mutation at a time?'," recounts Dr. Jacquemont.

Brain Canada Gets It
Dr. Jacquemont asserts that most funding agencies would not have supported this project. But Brain Canada saw value in Dr. Jacquemont's approach, and in the team that he assembled to pursue it, including autism expert Dr. Mayada Elsabbagh, neuropsychologist Dr. Sarah Lippé, and neuroimaging expert Dr. Alan Evans, to name a few. The team recruited 400 families to participate in their Brain Canada-funded study and after four years, was able to demonstrate significant correlations between certain genetic mutations and functional connectivity in the brain.

"With many of these same co-investigators, we've now turned our Team Grant into a much larger project – Q1K (Québec 1000 Families), which is the largest clinically integrated autism research project in the province of Quebec and one of the largest in the world," explains Dr. Jacquemont. Q1K received $10 million in philanthropic funding from Fondation Marcelle et Jean Coutu.

Research Momentum Is Growing
Dr. Jacquemont was also recently awarded a $2.5 million grant from the National Institutes of Health (NIH) to continue his bold approach of studying ecosystems of genes based on their contributions to brain function and behaviour in neuropsychiatric conditions. "There's no way we would have been able to get the NIH grant if it wasn't for the preliminary findings of our Brain Canada Team Grant – the hypothesis might have been interesting, but without the preliminary data it simply would not have been funded," says Dr. Jacquemont.

Data from Dr. Jacquemont's project is now shared through the Enhancing NeuroImaging Genetics through Meta-Analysis (ENIGMA) Consortium, a network of more than 2,500 scientists from around the world.

What's the Impact?
- Amplifying investment
- Additional $12.5M in funding

TEAM GRANTS

PROBIOTIC BEING TESTED AS A POTENTIAL TREATMENT FOR ALS

> **Other funders just didn't quite get what we were doing at the time.**
>
> Dr. Alex Parker

A strain of probiotic will soon be tested as a potential treatment for amyotrophic lateral sclerosis (ALS). The clinical study is taking place thanks to a $1.6 million investment by the Weston Family Foundation – critical funding that builds on a series of Discovery Grants from ALS Canada and Brain Canada.

Drug-Free Treatment

"This trial has received a lot of interest from people around the world. And I completely understand why – ALS is a devastating, incurable disease," explains Dr. Alex Parker, lead investigator and neuroscientist based at the CHUM Research Centre (CRCHUM) in Montreal. "Probiotics are well known. And they're not drugs, so the risk of side effects is minimal."

Benevolent Bacteria

Dr. Parker and his team use animal models to better understand – and ultimately find solutions for – diseases like ALS. Driven by trainee turned research associate Dr. Audrey Labarre, who recently received a Mitacs Accelerate internship to support her work, they discovered that a specific probiotic bacteria called Lacticaseibacillus rhamnosus HA-114 protects motor neurons — the nerve cells that wire the brain and control muscular movement — in a worm model of ALS.

With a 2021 ALS Canada - Brain Canada Discovery Grant, Dr. Parker and his team confirmed that the same protective effect occurs with a more complex animal model, the mouse.

Boosting Protective Lipids

Using genetic, behavioural, and imaging analyses, the team identified that lipid metabolism — and specifically the process of beta-oxidation that breaks lipids down into energy in the body's cells — is impaired in ALS, and restored with the probiotic. They believe that the HA-114 probiotic achieves this restoration by supplying lipids to the energy powerhouse of the cell, the mitochondria. The boosted lipid supply rebalances energy metabolism in ALS and leads to a decrease in neurodegeneration.

"This work has been supported by ALS Canada and Brain Canada Discovery Grants all along at different stages. Other funders just didn't quite get what we were doing at the time," says Dr. Parker.

Human Trials Underway

The clinical study of the HA-114 probiotic will involve 100 Canadian participants. Using serum and blood samples, the team will study the lipids and microbiomes of participants before and after treatment with the probiotic. Comparing healthy people and those with ALS will allow the team to better understand the lipid profile of ALS patients. It will also allow them to determine whether the restorative effects they've seen in worm and mouse models are possible in humans.

What's the Impact?

- Accelerating research
- Identifying solutions
- $1.6M new funding for clinical trial

KNOWLEDGE MOBILIZATION GRANTS

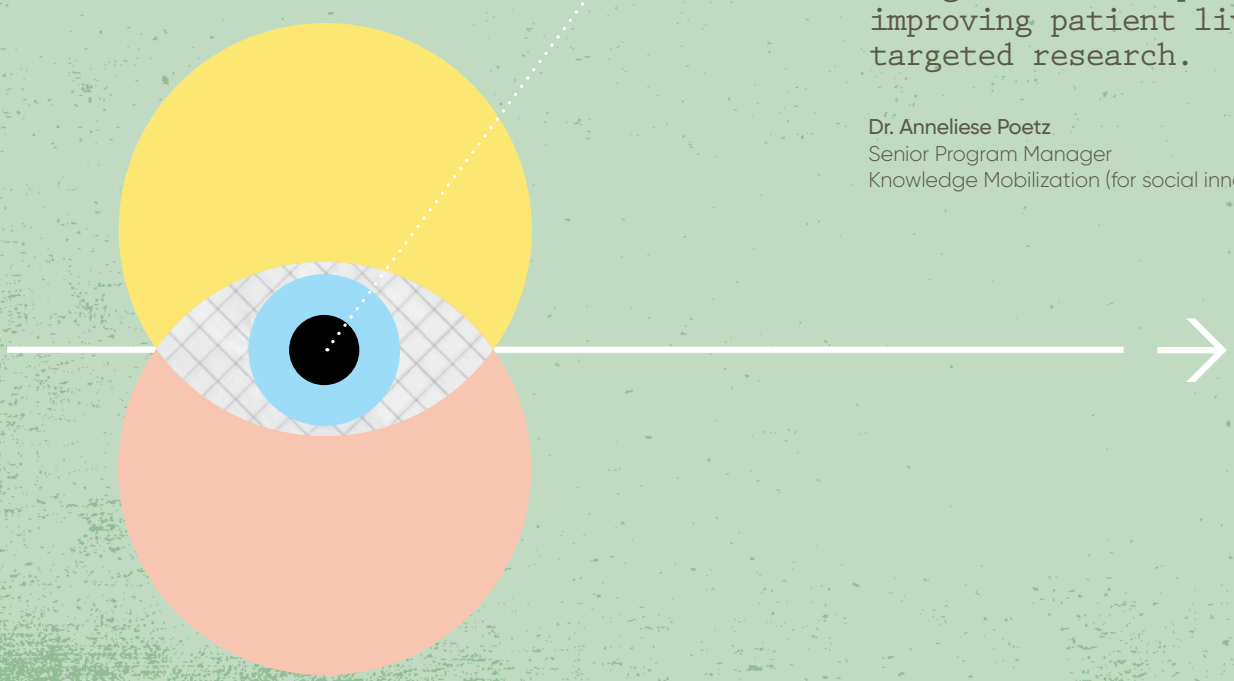
SEEING BETTER RESULTS BY SEEING THROUGH THE EYES OF THE PATIENT

Meet Real Canadians Living with Brain Injury

Thanks to the generous support of the Galati family and their gift of $850,000, Brain Canada is introducing a pioneering initiative on traumatic brain injury (TBI) to ground its funded research in the needs of diverse stakeholders. The results of the exercise will inform a call for research projects to address these needs.

> "To achieve research impact, you need to put the time and effort into finding out what the actual problems and priorities are. What we learn from stakeholders in this process will be used to inform the research agenda at Brain Canada and beyond well into the future. This approach is a significant step forward in improving patient lives with targeted research.

Dr. Anneliese Poetz
Senior Program Manager
Knowledge Mobilization (for social innovation)



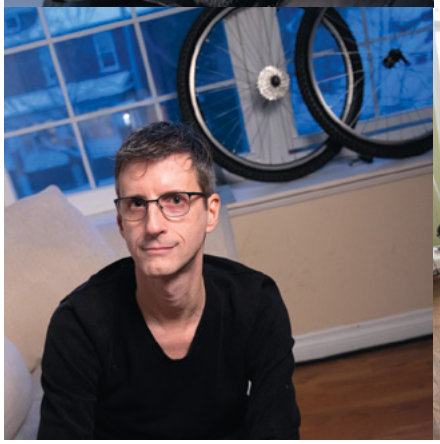
CHANGING PERSPECTIVES

Confronting the Stigma of Brain Health Issues

Led by Matthew Galati, a Canadian physician and brain injury survivor, the Galati family founded Brain Changes Initiative. Together, Brain Changes Initiative and Brain Canada are partnering to double their impact and support bold brain research in traumatic brain injury (TBI).

For Nathalie, some of the most difficult parts of her TBI are expressing herself and loneliness.

"I'm more isolated... and it's difficult to interact with people. Even with friends on the phone, sometimes I just have to say, 'I gotta go.'"



After a stroke that weakened his left side, Stéphane Rouleau says he slept nearly nonstop for almost a year. Now, he is meticulous about nutrition and fitness to support his recovery.

"The stroke made me realize that I have only one life to live. I have to take care of it. Because if I'm not there for me, how can I be there for anyone else?"

Nicole Hagley, an educator, past national athlete, and now yoga instructor, is still actively recovering from a bike accident two years ago.

"Once my face healed, then I came into the world of an invisible disability."

Peter Kyriakides, who survived a life-threatening trauma to the brain, sees a desperate need for more mentors and coaches for patients. He wonders if paying survivors to mentor others could fill gaps in the system.

“The first thing we need is support. Once the support was there, I was able to change my attitude.”

Jay Randhawa suffered a head injury during a soccer game that ended his career. He credits his faith in God for giving him strength throughout his recovery.

“Before my injury, I didn’t know anything about the brain.”

Rob Staffen recommends the MyBrainPacer app developed by St. Joseph’s Health Care in London, Ont., which he used to manage his activity levels during the recovery period post TBI.

“After I got out of the hospital, you could never tell by looking at me that I was injured.”

Susan Marsh, whose daughter suffered a catastrophic TBI, is adamant about preserving the dignity of those with invisible disabilities.

“It felt like she wasn’t ‘disabled enough,’ and in many people’s eyes, she looked ‘fine.’”

Photography: Owen Egan and Joni Dufour

ANNUAL GRANT RECIPIENTS

THE BRILLIANCE WE RECOGNIZED THIS YEAR

Brain Canada takes great pride in the 104 grants awarded. We are committed to supporting this ground-breaking research and its potential impact on advancing our understanding of the brain.

Platform Support Grants

2021 Platform Support Grants (PSG)
Signe Bray
Emma G. Duerden
Sean Dukelow
Benicio N. Frey
Vivian K. Mushahwar
Trevor Pugh
Guy Rouleau
Lisa Saksida
Sylvia Villeneuve

Capacity Building Grants

2021 Turnbull-Tator Award in Spinal Cord Injury & Concussion Research
Aaron Phillips

2021 Future Leaders in Canadian Brain Research
Phillippe Albouy
Elie Bou Assi
Vincent Breton-Provencher
Lindsay Bodell
Lindsay Cahill
Carlos Camara-Lemarroy
Annie Ciernia
Michèle Desjardins
Catherine Duclos
Emma Duerden
Alexandre Fisette
Federico Gaiti
Saptharishi Lalgudi (Rishi) Ganesan
Jiami Guo
Karl Klein
Julien Muffat
Aislin Mushquash
Shaun Sanders
Ashlyn Swift-Gallant
Christoph Zrenner

2022 Rising Stars Trainee Awards
Courtney Bannerman
Samantha Baglot
Laura Best
Allison A. Dilliott
Jude Frie
Logan Froese
Leah Mercier
Sara de la Salle
Taylor Snowden
Marie-Kim St-Pierre
Flavia Venetucci Gouveia

Brain Canada Youth Mental Health Platform Powered by RBC Future Launch
Sean Hill

Alzheimer's Association International Research Grant Program
Sylvain Baillet
James Carmichael
Brian Chen
Shehroz Khan
Derya Sargin
Nathan Spreng

ALS Canada-Brain Canada Trainee Program 2022
Hussein Ghazale
Lucia Liao
Charlotte Manser
Donovan McDonald

ALS Canada-Brain Canada Career Transition Award 2022
Philip McGoldrick

Team Grants

Alzheimer's Association-Advancing Research on Care & Outcome Measurement (ARCOM)
Jennifer Bethell
Ayse Kuspinar

European Union Joint Programme on Neurodegenerative Disease Research (JPND)
Mario Masellis

ALS Canada-Brain Canada Discovery Grant Program 2021
Agessandro Abrahao
Freimut Juengling
Christine Vande Velde

ALS Canada-Brain Canada Discovery Grant Program 2022
Renée Douville
Thomas Durcan
Alex Parker
Richard Robitaille
Carlos Camara-Lemarroy
Gary Shaw
Maria Stepanova
Christine Vande Velde
Maria Vera Ugalde

Bell Let's Talk-Brain Canada Mental Health Research Program
Daniel Blumberger
Manuela Ferrari
Catherine Lebel
Austen Milnerwood
Tarek Rajji

Brain Canada-Cancer Research Society Translational Research Grants
Eric Chen

JDRF Canada-Brain Canada Addressing Mental Health in Type 1 Diabetes
Marie-Eve Robinson
Peter Selby
Tricia Tang

Brain Canada-Women's Brain Health Initiative Expansion Grants: Considering Sex & Gender
Mark Bayley
Janelle Drouin-Ouellet
Jodi Edwards
Gillian Einstein
Jonathan Epp
Christian Ethier

Heart & Stroke - Brain Canada Heart-Brain Connection IMPACT Award
Douglas Lee
Peter Liu

Kids Brain Health Network Strategic Investment Fund 2021
Adam Kirton
Johanna Lake
Peter Rosenbaum

Canadian Cancer Society (CCS) Breakthrough Team Grants: Transforming Low Survival Cancers
Gelareh Zadeh
Marshall Pitz

Canadian Stroke Consortium - Brain Canada-Heart & Stroke 2022 Stroke Clinical Research Catalyst Grants
Alexandre Poppe
Aristeidis Katsanos
Aravind Ganesh
Raed Joundi
Deborah Siegal
Michelle Ploughman

Kids Brain Health Network Early Career Investigator & Mentorship Awards 2021
Carly McMorris
Ning Cheng
Sarah Munce

Women's Brain Health Initiative Mind Over Matter - Volumes 14-18

Competitions Launched 2022 (New & Recurring)

ALS Canada - Brain Canada: Clinical Research Fellowship
ALS Canada - Brain Canada: Trainee Program
ALS Canada - Brain Canada: Discovery Grants
ALS Canada - Brain Canada: Career Transition Award
Alzheimer's Association: International Research Grant Program (IRGP) (Jan. - Aug. 2022)
Alzheimer's Association: LINC-AD Program (ARCOM 2.0)
Alzheimer's Association: International Research Grant Program (IRGP) (Aug. 2022 - Jan. 2023)
Alzheimer Society Research Program (ASRP): New Investigator Operating Grants
Alzheimer Society Research Program (ASRP): Proof of Concept Grants
Canadian Stroke Consortium - Brain Canada - Heart & Stroke: Stroke Clinical Research Catalyst Grants
Brain Canada - Cancer Research Society: Translational Research Grants
EU Joint Programme - Neurodegenerative Disease Research (JPND)
CQDM: Quantum Leap
Brain Canada: Rising Stars Trainee Awards
Future Leaders in Canadian Brain Research
Heart & Stroke - CIHR Institute of Circulatory and Respiratory Health - Brain Canada: Personnel Awards for Black Scholars
MEDTEQ+ - Brain Canada: Call for Innovation Proposals - Mental Health
Barbara Turnbull Foundation for Spinal Cord Research - Brain Canada: Turnbull-Tator Award in Spinal Cord Injury and Concussion Research
Brain Changes Initiative - Brain Canada - Branch Out Neurological Foundation: Special Purpose Grants - Brain Changes Initiative Award for Traumatic Brain Injury
Canadian Cancer Society (CCS) Breakthrough Team Grants: Transforming Low Survival Cancers

Competitions Launched 2023 (New & Recurring)

ALS Canada - Brain Canada: Clinical Research Fellowship
ALS Canada - Brain Canada: Trainee Program
Alzheimer's Association: International Research Grant Program (IRGP) (Jan. - Aug. 2023)

FUNDRAISING

WORKING HARD BEHIND THE SCENES

As a national non-profit health charity, Brain Canada recognizes the need for fundraising to drive impactful advancements in brain research. With a steadfast commitment to improving brain health and understanding neurological conditions, our community of donors and partners play a pivotal role in supporting innovative research projects, fostering collaboration among experts, and ultimately transforming lives through discoveries. By mobilizing resources through our collective fundraising efforts, Brain Canada empowers the scientific community to push boundaries, unlock new knowledge, and pave the way for transformative breakthroughs in brain health for the benefit of all people in Canada.

> “If we invest more funding in brain research, we can support life-changing breakthroughs and save lives.

Eric Pilon-Bignell
Founder of Project7
Eric is climbing seven of the world’s highest mountains in support of Brain Canada.

WOMEN'S BRAIN HEALTH INITIATIVE

BRINGING WOMEN'S UNIQUE BRAIN HEALTH CHALLENGES INTO VIEW

We are deeply grateful to the Women's Brain Health Initiative (WBHI) for its unwavering dedication to advancing women's brain health in 2022 through their annual Stand Ahead Challenge fundraiser. This remarkable event, marked by a special lunch on Women's Brain Health Day, December 2nd, served as a powerful platform for raising awareness and funds. The Stand Ahead Challenge not only encourages individuals to participate actively but also facilitates a collective effort in supporting crucial research initiatives. In a testament to their commitment to the cause, once again this year WBHI generously donated $250,000 from the proceeds of the Stand Ahead Challenge to Brain Canada. These funds are instrumental in driving forward sex and gender science, enabling innovative research projects to better understand and address the unique aspects of women's brain health. The partnership between WBHI and Brain Canada remains a beacon of hope and progress, championing the cause of women's brain health and fostering transformative change in the field.

Through the Brain Canada-WBHI Expansion Grants: Considering Sex and Gender Program, six Canadian research teams have been awarded funding for the implementation and/or continuation of sex and gender considerations in research on aging, neurodegeneration, and stroke. WBHI, Brain Canada and Canadian Institutes of Health Research (CIHR) also funded a European Union Joint Programme on Neurodegenerative Disease Research (JPND) grant that specifically includes sex-based analysis.

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1. Brain Canada President & CEO Dr. Viviane Poupon, Citrine Foundation of Canada Secretary Zak Bhamani, and The Honourable Carolyn Bennett, Minister of Mental Health and Addictions. **2.** Special guest, comedian and mental health advocate Mary Walsh with WBHI Founder and President Lynn Posluns. **3.** MC Pattie Lovett-Reid with WBHI Founder and President Lynn Posluns, and MC Anne-Marie Mediwake.

> "Brain Canada is a leader when it comes to investing in sex-and gender-based considerations in brain research.

Lynn Posluns
Founder & President, Women's Brain Health Initiative

GALA 2022

THE NIGHT OF THE EXPLORERS

In 2022, Brain Canada witnessed a remarkable year in terms of fundraising efforts. As the world emerged from the grips of the COVID-19 pandemic, the organization's dedicated community of volunteers played a pivotal role in organizing a series of impactful events. These events ranged from intimate gatherings to a large-scale gala, all with the shared objective of supporting brain research. One notable occasion was the highly anticipated fundraising gala, aptly named "The Night of the Explorers," held in Toronto in November.

The Night of the Explorers was a tribute to our explorers, the country's boldest brain researchers who are venturing into the great unknown that is the brain, and mapping unchartered territory. The brain is the last great frontier, and Brain Canada is proud to support their bold explorations.

This captivating soirée brought together some of the country's premiere philanthropists, researchers, and brain health advocates, creating an atmosphere of inspiration and unity.

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1. Brain Canada welcomed 230 guests to The Night of the Explorers in Toronto on November 8, 2022. **2. Left to right:** Dr. Amer Burhan, Physician in Chief, Ontario Shores Centre for Mental Health Sciences, Steven Wolff, Former CEO of CIBC Mellon, Director – Board of Directors, Ontario Shores Centre for Mental Health Sciences and Dawne Barbieri, Vice President, Clinical & Research, Ontario Shores Centre for Mental Health Sciences **3. Left to right:** Peter S. Morton, Partner, Pembroke Private Wealth Management Ltd., Bill Molson, Senior Vice President, Turtle Creek Asset Management and Brain Canada Director, Dr. David S. Park. **4.** Brain Canada President and CEO, Dr. Viviane Poupon. **5.** Brain Canada Chair, Naomi Azrieli **6.** Guests enjoyed the multimedia presentation with floor to ceiling screens providing an immersive experience at the event.

> Exploring the great unknown that is the brain takes a community and the support of dedicated donors and partners. With this support, Brain Canada is fuelling groundbreaking research and shaping the future of neuroscience.

Kate Pal
President, Pal Insurance
Member of Brain Canada's Sustainability Committee

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7. From left to right: Meir Rotenberg, TD Wealth; Dr. Michelle Friedman; Sharon Wolfe; Daniel Rotenberg (child in front), with family friends Dr. Daphna Grossman and Matthew Grossman. **8.** Brain Canada President & CEO Viviane Poupon spoke about the Foundation's One Brain approach in her remarks. **9.** Dr. Irwin Adam Eydelnant, Food Futurist and Guest Speaker. **10. From left to right:** Jim and Sandi Treliving, RBC Wealth Management Deputy Chairman and Brain Canada Director Wayne Bossert, Valerie Chort, Vice President Corporate Citizenship & Sustainability, RBC and Vice President, Social Impact and Innovation at RBC Mark Beckles. **11.** Brain Canada-funded researcher Dr. Emma Duerden and her husband Aurélien Bonin

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VOLUNTEER-LED INITIATIVES

RAISING AWARENESS AND FUNDS

Brain Canada's passionate volunteers organized various fundraising initiatives, including a walk in support of amyotrophic lateral sclerosis (ALS) research in Quebec led by tireless advocate Linda Auger Morissette, to a milestone birthday celebration fundraiser, and even a thrilling mountain climbing expedition up the highest mountain peak in North America. These grassroots efforts exemplify the unwavering commitment of the community towards advancing brain research and fostering hope for those affected by neurological disorders.

Volunteer Linda Auger Morissette's annual fundraising walk, The Perseids of Hope, took place in Saint-Basile-de-Portneuf, Quebec and raised more than $10,000 for ALS research this year. In 2017, Linda Auger Morissette's brother, Pierre, received an ALS diagnosis at the age of 52.

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1. Dr. Matthew Galati is a brain injury survivor and founder of Brain Changes Initiative. He leads the annual fundraiser Move for Neurogenesis in collaboration with Brain Canada, taking participants through a circuit workout incorporating both aerobic exercise and high-intensity, plyometric interval training.
2. Guests to Bill William's birthday fundraiser in Toronto enjoyed hors d'oeuvres at the milestone celebration for a cause.
3. Eric Pilon-Bignell's Project7 goal is to climb Everest, Aconcagua, Denali, Kilimanjaro, Elrus, Kosciuszko and Vinson in honour of his father.
4. Montreal company MicroAge held a step-a-thon fundraiser in support of brain research in 2023. Participants tracked their steps and raised funds in the process. Thanks to the generosity of its employees, MicroAge donated $1,000 to Brain Canada through this initiative.

2

3

4

> "My father passed away from ALS a few years ago, and now my eldest brother is also affected by the disease. ALS is truly heart-breaking, and we need to learn more about it to better help those who are suffering.

Linda Auger Morissette

DONORS

WE COULDN'T SEE ALL THIS PROGRESS WITHOUT YOU

Thank you to our donors. In a world where the unseen often remains unnoticed, we pause to express our appreciation. We are immensely grateful for the generosity of those who have made donations in support of brain research this year.

> "Brain Canada's ability to pool resources and secure matching funds attracts individual and corporate donors. Looking across Canada, and internationally, the most important thing is for organizations to share knowledge and work together for the common good. That's what we are doing with Brain Canada."

Janis Levine
President & Executive Officer, The Henry & Berenice Kaufmann Foundation

LEAD DONORS

(cumulative giving 2011 – March 31, 2023)

We gratefully acknowledge the cumulative contributions of our lead donors who have supported Brain Canada over the years.

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January 1, 2022 - March 31, 2023

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OUR FINANCIAL SNAPSHOT

A CLEAR FINANCIAL OUTLOOK

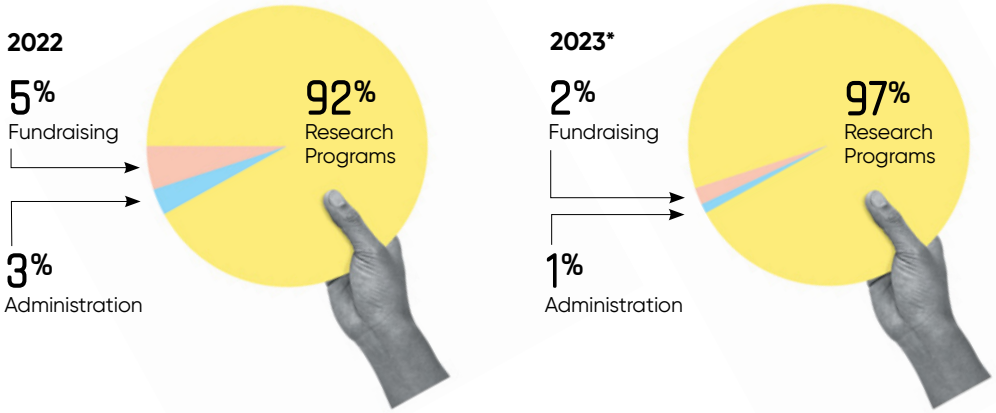
Audited Financial Statements Prepared by Ernst & Young

Brain Canada has shifted its fiscal year from January 1 - December 31 to start April 1 and run through March 31, resulting in the current annual report covering a unique 15-month period that encompasses two fiscal years. This adjustment aligns the organization's financial reporting with its revised fiscal timeline.

Brain Canada Foundation
Statement of Financial Position
As at

	March 31, 2023 $	December 31, 2022 $
Assets		
Current		
Cash and Cash Equivalents	8,950,609	17,236,583
Cash - Restricted	200,000	—
Accrued Interest Receivable	9,554	9,211
Other Receivables	73,535	118,675
Contribution Receivable from the Government	4,270,592	—
Prepaids and Deposits	72,311	68,624
Total Current Assets	13,576,601	17,541,844
Tangible Capital Assets	104,734	108,751
	13,681,335	17,433,093
Liabilities And Net Assets		
Current		
Accounts Payable and Accrued Liabilities	138,220	193,480
Salaries and Benefits Payable	310,079	389,287
Current Portion of Deferred Contributions	7,420,350	10,754,159
	7,868,649	11,336,926
Total Current Liabilities	3,721,668	3,402,268
Deferred Contributions	11,590,317	14,739,194
Net Assets	1,986,284	2,693,899
Unrestricted Net Assets	104,734	108,751
Invested in Capital Assets	2,091,018	2,802,650
	13,681,335	17,541,844

The complete financial statements including notes as of December 31, 2022 and March 31, 2023 are available on the Brain Canada website, www.braincanada.ca



Brain Canada Foundation
Statement of Operations

	March 31, 2023 $ [3 months]	December 31, 2022 $ [12 months]
Revenues		
Restricted Contributions	12,203,158	24,486,084
Unrestricted Contributions from Donors	28,445	248,498
Special Events	—	1,187,370
Interest Income	153,479	190,096
	12,385,082	24,486,084
Expenditures		
Grants and Awards*	11,994,482	19,901,156
Operating Expenses	1,098,215	4,206,795
Amortization of Tangible Capital Assets	4,017	16,621
	13,096,714	24,124,572
Excess (deficiency) of revenues over expenditures	(711,632)	361,512

* These % are for a 3-month period
* Total does not include $7.4M in committed payments transferred directly to host institution by partners and donors as indicated in the notes of the audited financial statements.

The complete financial statements including notes as at December 31, 2022 and March 31, 2023 are available on the Brain Canada website, www.braincanada.ca

OUR PARTNERS

BEHOLD, OUR PARTNERS

As Canada's only major funder focused exclusively on brain research, Brain Canada collaborates with more than 100 partners, strengthening relationships and fostering collaborations. With these valued partners we work together to contribute to a better understanding of the brain.

Lead Donors

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RBC
Garfield Weston FOUNDATION
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THANK YOU FOR FUNDING BRILLIANCE DAILY

Health Canada Santé Canada

Production of this Annual Report has been made possible with the financial support of Health Canada through the Canada Brain Research Fund. The views expressed herein do not necessarily represent the views of the Minister of Health or the Government of Canada.

Brain Canada is a national registered charity that enables and supports excellent, innovative, paradigm-changing brain research in Canada.

Registration number: 89105 2094 RR0001.
This Annual Report is also available in French.
An online version can be viewed and downloaded at braincanada.ca

Brain Canada Foundation

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braincanada.ca

Break Down Silos, So More People Can See the Science.

Brain Canada's commitment to open science aligns with the recognition that the complexities of the brain necessitate collective efforts and a free exchange of information. By promoting open science principles and providing resources to researchers, Brain Canada plays a crucial role in fostering innovation and accelerating progress in neuroscience.

See the Barriers To Equality, and Eliminate Them.

As a national convenor and enabler of the Canadian brain research community, Brain Canada is supporting efforts to reduce health inequities. This includes efforts to assess the different ways that brain diseases and disorders affect men, women, and gender diverse groups, as well as various stages of neurodevelopment and aging. Brain Canada's goal, in the process, is to advance sex and gender brain science and remove systemic barriers and biases to ensure that all have equal access to – and will benefit from – the results of brain research.

Fondation
Brain Canada
Foundation