

A smart investment in Canadian brain research

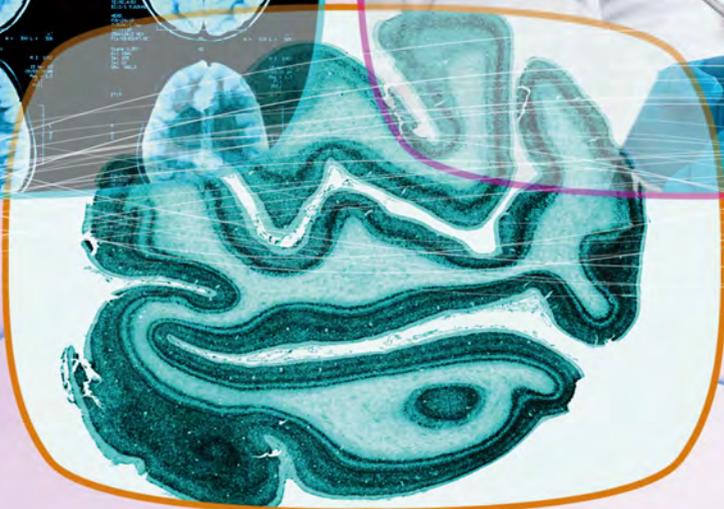
Annual Report 2013

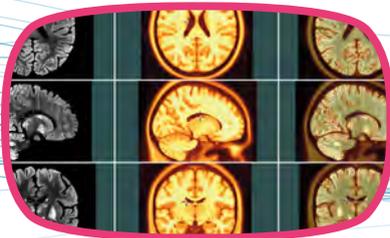


Brain Canada



NeuroScience
CANADA





2013

May 6

Held final stakeholder consultation meeting in Halifax.

August 7

Awarded seventh Dr. Hubert van Tol Travel Fellowship to Anastassia Voronova, a postdoctoral student in the Developmental and Stem Cell Biology Department at The Hospital for Sick Children in Toronto, Ontario.

September 30

Held the fourth RBC-sponsored parlour dinner in Vancouver. The event was co-Chaired by Brain Canada Director Brandt C. Louie and David Bustos, Managing Director, RBC Capital Markets, and featured a presentation by Dr. Terrance P. Snutch titled *Turning down the hyperactive brain*.

October 31

Announced the Request for Applications for the 2013 Platform Support Grants Sponsored Opportunity.

November 5

Launched the 2013 Brain Canada Multi-Investigator Research Initiative Sponsored Opportunity program.

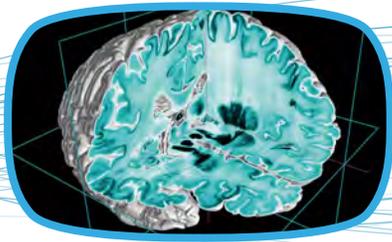
November 11

Announced the joint funding of five additional Multi-Investigator Research Initiative grants and associated funding partnerships, bringing the total of funded teams to 10 for the first (2012) MIRI program.

December 12

Announced a \$7.5-million partnership with the Michael Smith Foundation for Health Research, the Pacific Alzheimer Research Foundation and Genome BC to support projects focused on Alzheimer's research led by Principal Investigators in BC.

Highlights 2013-2014



2014

February 7

Initiated a partnership with the Canadian Cancer Society to support Canadian Cancer Society Impact Grants focused on brain and nervous system cancer research.

February 11

Held the fifth RBC-sponsored parlour dinner in Halifax. The event was co-chaired by Brain Canada Chair Rupert Duchesne and Ed Steeves, Regional Vice President, RBC Wealth Management, and featured a presentation by Dr. Stan Kutcher titled *School mental health: mental health literacy and mental health care for young people*.

March 21

Confirmed a partnership with the MS Society of Canada to provide a total of \$3 million (from both partners), to fund one MIRI project studying Multiple Sclerosis.

April 18

Extended invitations to submit Full Applications to 30 of the 52 teams that applied to the 2013 MIRI Sponsored Opportunity.

May 1

Prime Minister Stephen Harper, along with members of the Chagnon Family and Azrieli Foundation, and representatives from Brain Canada, announced the support of one major project in the area of Alzheimer's disease prevention, and four projects in the areas of Autism Spectrum Disorder and Fragile X syndrome.

May 12

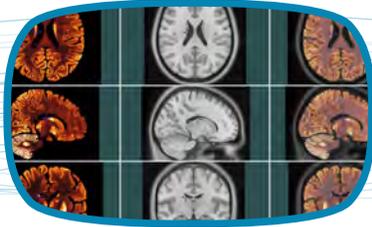
Announced two Alberta partnerships as part of the 2013 Multi-Investigator Research Initiative Sponsored Opportunity, \$5.6 million to co-fund one team studying dementia and healthy brain aging, and \$3 million to co-fund two teams at least one of which will be focused on mental health.

May 26

Launched the Focus on Brain program, a CQDM/Brain Canada partnership open to multidisciplinary research teams linking Quebec and other Canadian researchers, and the academic and small and medium-sized enterprise ("SME") sectors.

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 Montreal Neurological Institute, McGill University
 Page 15 - Dr. Alan Evans: Owen Egan, courtesy of McGill University

www.braincanada.ca

The Brain Canada Foundation (referred to throughout as “Brain Canada”) is a national, charitable organization with the goal of funding research aimed at unlocking the mystery of the brain, and developing diagnostics, treatments and ultimately cures for brain disorders.

Partnership Registration number: 86870 6326 RR0001
 Foundation Registration number: 89105 2094 RR0001

Message from the Chair and President

In 1998, a group of business and science leaders came together to begin the transformation from the Government-funded NeuroScience Network Centre of Excellence to what is now the public foundation “Brain Canada”. They could not have imagined that they would become pioneers in the philanthropic space to support Canadian brain research. Over these past 15 years, they have been part of the effort to raise awareness about brain disorders and their impact on patients and families, and the corresponding “call” around the world to dramatically increase investments in research.

This past year was critical to demonstrating the success of our transformation. Since the launch of the Canada Brain Research Fund in 2012—a potential \$200 million public-private partnership between Brain Canada and the Government of Canada—the organization had to quickly achieve a quantum leap in scale and scope. We began with a foundation of good governance and a track record of developing and running an innovative research program that was celebrated internationally: enabling our best and most promising researchers to join together and pursue paradigm-changing ideas. We also continued with our commitment to invest 90% of funds raised in research, which ensures that donor dollars are achieving maximum impact.

We are proud to report that, by the end of 2013, we had reached \$35.625 million of our \$100-million goal, and as of the publication of this report, we have closed in on \$45 million. These funds are being matched by the Government of Canada on a 1:1 basis. \$35.5 million has already been directed to support 15 team grants and 14 training awards—an unprecedented injection of new funding in this area. This includes the two largest

public-private funds to support research on the prevention of Alzheimer Disease and Related Disorders with the Chagnon Family, and on neurodevelopmental disorders, with a focus on Autism Spectrum Disorder and Fragile X syndrome with the Azrieli Foundation. On May 1, 2014, the Azrieli family increased their initial \$4.25 million commitment by \$3.25 million. These key investments will dramatically advance neurodegenerative and neurodevelopmental research in Canada.

At the same time, Brain Canada has been steadily expanding our reach and our profile, by participating in major meetings and conferences, and through partnerships including one with Bell which highlights their leadership in mental health. Additional partnerships with health research charities, provincial funding agencies, and private foundations are supporting excellent research in Parkinson’s disease, ALS, brain injury, brain cancer and vision. We are also making the case that, like our collaborative research model, all of us in the brain community must find ways to coordinate efforts, reduce duplication and overlap, and stay focused on serving the millions of Canadians who are depending on us to accelerate the search for new or improved diagnostics, prevention interventions, treatments, and ultimately cures. A chorus of voices in harmony will be best heard.

We thank all of our supporters over the past year, and especially the Government of Canada, whose vision and leadership on brain health is ensuring that Canada continues to have a central role in the global quest to understand the brain and brain disease. We would also like to thank Prime Minister Harper personally, who made the time to join Brain Canada and special guests for the announcement

of the results of the Chagnon and Azrieli competitions, on May 1, 2014 in Montreal. His support for our cause, and his warmth and generosity in staying to meet everyone who wished to have a word or photo with him, we took as a significant indication of his commitment to brain research.

Finally, we end on a sad note. As this report was going to print, we learned of the sudden death of our beloved Director, Marcel Côté. For more than one decade, he was an active, engaged volunteer who brought valued insights and energy to Board discussions, and who contributed in many important ways to the success of our organization. We are devastated and we will miss him greatly.

This report—which showcases the culmination of the collective efforts of Board, staff, advisors, partners, collaborators—is dedicated to Marcel, with deep thanks and appreciation for all he did for Brain Canada, and for his steady and constant belief that we could come this far, and reach even greater heights in the future. We fully intend to do so.



Rupert Duchesne
Chair, Brain Canada



Inez Jabalpurwala
President and CEO, Brain Canada



Prime Minister Stephen Harper with members of the Brain Canada Board of Directors. From left to right: Mark Krembil, Lili de Grandpré, Vincent Castellucci, Max S. Cynader, The Rt. Hon. Stephen Harper, Rupert Duchesne, Marcel Côté, Hon. W. David Angus, Inez Jabalpurwala.

The Brain and brain research around the world

The brain is the most critical organ in the body, but the least understood. Ninety percent of what we know about the brain was discovered in the past 20 years. There are more than 1,000 psychiatric diseases, neurological disorders and brain and spinal cord injuries. These disorders can occur at any stage in life, from Autism, which strikes in early childhood, to Multiple Sclerosis and epilepsy, which can become apparent in young adults, to Parkinson's and Alzheimer's, which have a late adult onset. Chronic pain, brain tumours, psychiatric disorders and addictions develop in people of all ages.

While some brain diseases respond to treatment, there are no cures.

There are common mechanisms across the range of brain disorders, such as cell loss, abnormal

functioning of nerve cells, and chemical and molecular imbalances in the brain. Looking at the brain as one system can lead to breakthroughs that will have impact on multiple conditions.

One in three Canadians will be affected. The economic and human burden of brain disorders is estimated at \$60 billion, or about 38% of the total burden of disease. This is greater than the burden of cancer and cardiovascular disease combined.

Collectively, the diseases of the brain are the major health challenge of the 21st century. Over the past few years, world leaders, scientists and major philanthropic organizations have realized this and risen to the challenge, bringing unprecedented attention and resources to accelerate the pace of brain research aimed at understanding brain function and dysfunction.

Human Brain Project (HBP)

- Europe-based (32 organizations from 13 countries)
- Launched on October 7, 2013
- 1 billion euros
- Goal is to simulate the complete brain on a supercomputer

*“Collaborate, collaborate, collaborate.
This is our opportunity.”*

– Prof. Karlheinz Meier, University of Heidelberg,
Co-director of the HBP and co-leader of the Neuromorphic Computing Subproject

The Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative

- US-based
- Launched on April 2, 2013
- \$100 million US
- Goal is to map every single neuron in the brain

“As humans, we can identify galaxies light years away. We can study particles smaller than an atom. But we still haven't unlocked the mystery of the three pounds of matter that sits between our ears.”

– US President Barack Obama at launch of BRAIN initiative

Brain Canada

Brain Canada is a national non-profit organization that enables and supports excellent, innovative, paradigm-changing brain research in Canada. For more than one decade, Brain Canada has made the case for the brain as a single, complex system with commonalities across the range of neurological disorders, mental illnesses and addictions,

Vision.

To understand the brain, in health and illness, to improve lives and achieve societal impact.

Mission.

Brain Canada is achieving its vision by:

- Increasing the scale and scope of funding to accelerate the pace of Canadian brain research;
- Creating a collective commitment to brain research across the public, private and voluntary sectors; and
- Delivering transformative, original and outstanding research programs.

brain and spinal cord injuries. Looking at the brain as one system has underscored the need for increased collaboration across disciplines and institutions, and a smarter way to invest in brain research that is focused on outcomes that will benefit patients and families.

Values.

- **Connecting with purpose.**
 - **“One brain”.** Seeking to understand different brain functions and dysfunctions as part of a single interconnected system.
 - **Partnerships.** Building mutually beneficial and transparent relationships with every partner.
 - **Diverse perspectives and approaches.** Fostering original insights and outcomes.
- **Outcome focused.** Delivering value and benefits with efficiency and effectiveness.
- **Professional integrity.** Ensuring the highest standards of ethical behaviour and good governance.



Prime Minister Stephen Harper with members of the Brain Canada team. From left to right: Mario Petraglia, Hugh Blakey, The Rt. Hon. Stephen Harper, Haifa Staiti, Inez Jabalpurwala, Lisa Leung.

For more information about Brain Canada's current funding opportunities, information about the brain and nervous system, and current research being funded please visit www.braincanada.ca.

Brain Canada The Canada Brain Research Fund

The Canada Brain Research Fund is a public-private partnership designed to encourage Canadians to increase their support of brain research, and maximize the impact and efficiency of those investments. **Brain Canada has committed to raising \$100 million from private and non-governmental sources, which will be matched by government on a 1:1 basis.** The Fund was announced in federal budget 2011, which proposed to “allocate up to \$100 million

to establish the Canada Brain Research Fund, which will support the very best Canadian neuroscience, fostering collaborative research and accelerating the pace of discovery, in order to improve the health and quality of life of Canadians who suffer from brain disorders.”

The Canada Brain Research Fund supports three types of grants. Funding recipients are selected through an open and transparent, peer-review process.



Brain Canada's research funding programs support:

- The full spectrum of brain research, from basic to population health, and all relevant disciplines including those in the physical, applied, and social sciences;
- High-risk/high-gain research;
- Rising stars and future leaders in the Canadian brain research community;
- Unorthodox and innovative collaborations between and within disciplines, to develop new approaches and solutions to intractable problems;
- International collaboration and partnerships, which increase the visibility and participation of Canadian researchers in worldwide brain research, provide an enriched training and career development experience, and give access to the best possible infrastructure and sources of data.

A Public-Private Partnership to support Canada's world-class brain research

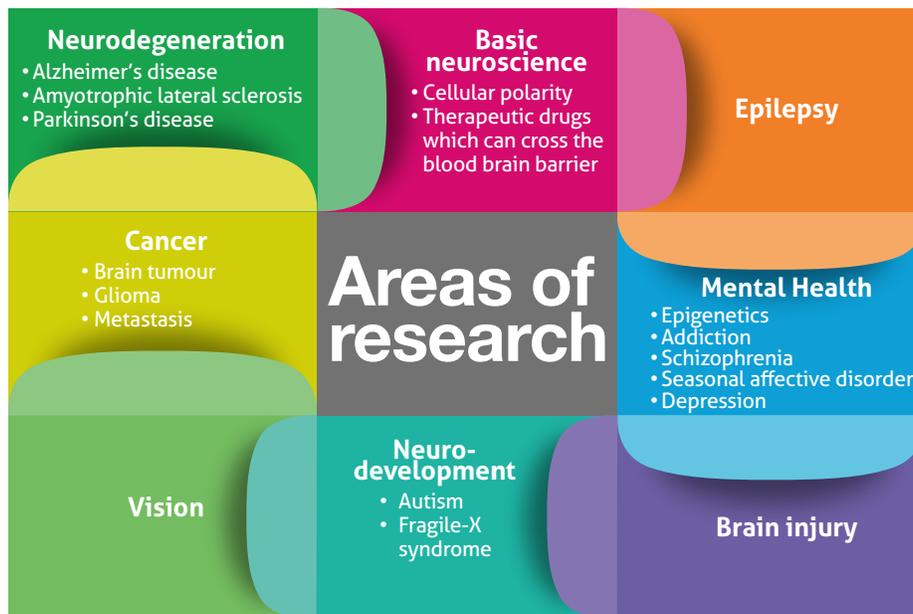


“Millions of Canadians will suffer from neurological illnesses during their lives, impacting their families and their communities. Our Government is using innovative new public-private partnerships to stretch dollars being used to improve the neurological and mental health of Canadians.”

– Prime Minister Stephen Harper speaking at the May 1 announcement

Brain Canada's impact on neuroscience research

16 principal investigators, 85 co-applicants and 14 trainees funded over 29 research projects focused on the brain and nervous system



Geographic locations of MIRI Team Leaders and Training Award Recipients

MIRIs: ● British Columbia (8), ● Alberta (4), ● Saskatchewan (1), ● Ontario (54), ● Quebec (20).

Training awards: ◆ British Columbia (1), ◆ Alberta (1), ◆ Ontario (10), ◆ Quebec (2).

Brain Canada Programs Multi-Investigator Research Initiative (MIRI)

The Multi-Investigator Research Initiative (MIRI) program was the first Canada Brain Research Fund research program launched. This grants program aims to support multidisciplinary teams and accelerate novel and transformative research that will fundamentally change our understanding of nervous system function and dysfunction and their impact on health.

Brain Canada's MIRI grants are for three years and normally provide up to \$500,000 a year for a total of \$1.5 million. The research focus may be related to any area of neural function and dysfunction, including special senses, neurological and mental health, and may involve biomedical, clinical, health services or population health approaches. To date, two competitions have been launched and updates on both programs are below and on the following pages.

2012 MIRI

Highlights

- Launched May 2012
- Received 165 Letters of Intent
- 31 invited to submit full applications
- \$1.5 million over three years
- 10 teams funded
- Supporting research in **Neurodegeneration, Vision, Mental Health and Movement Disorders**

The first MIRI competition was launched on May 17, 2012. A total of 165 applications were received from teams across the country. Following a two-stage review process, 10 proposals were deemed by the Selection Committee to have met their established threshold of excellence and were recommended for funding.

The five top ranked teams were announced on April 29, 2013 and are being funded by The W. Garfield Weston Foundation and Canada Brain Research Fund match, with additional funding provided by The Krembil Foundation for one of the grants. In recognition of the Weston's leadership donation, the grants are named *The W. Garfield Weston Foundation – Brain Canada Multi-Investigator Research Initiative (MIRI) Grants*.

The remaining five teams were announced on November 11, 2013, thanks to the following contributing partners:

Genome British Columbia
Institut universitaire en santé mentale
de Québec
Koerner Foundation
Le Fonds de recherche du Québec - Santé (FRQS)
McGill University
Michael Smith Foundation for Health Research
The Hospital for Sick Children
The Hospital for Sick Children Foundation
Toronto General
and Western Hospital Foundation
Western University
University of British Columbia
University of Saskatchewan

Brain Canada Programs

2012 MIRI team grant recipients



Dr. Sandra Black - team leader
Sunnybrook Health Sciences Centre

Validation of ocular measures as potential biomarkers for early detection of brain amyloid and neurodegeneration. Current methods for screening and early detection of dementia are costly and invasive. To remedy this, the investigators are evaluating two non-invasive eye measurements. The first technique will examine the retina for changes in nerves and blood vessels, and the second to detect the presence of beta-amyloid in the lens. If these two eye measurement techniques are found to be effective they will present new opportunities for early dementia detection.



Dr. Neil Cashman - team leader
University of British Columbia

Propagated protein misfolding of SOD1 in ALS: exemplar for neurodegeneration. Neurodegenerative diseases belong to a larger group of illnesses known as protein misfolding diseases. The misfolding into an abnormal shape of the SOD1 protein results in the toxic accumulation causing motor neuron death that eventually destroying muscle function. The researchers will utilize therapeutic antibodies to target misfolded SOD1, and proposed a comprehensive research program to better understand the protein conversion process and how this translates to disease.



Dr. Michel Cayouette - team leader
Institut de Recherches Cliniques de Montréal

Neuronal polarity defects as an underlying cause of neurological diseases. Cellular polarity is a possible mechanism underlying multiple brain diseases such as neurodegeneration, neuronal connectivity, and brain cancer. The Par family of proteins is responsible for correctly segregating cellular components. The investigators will track Par proteins during neuron creation, connection, communication and maintenance in the mature nervous system. This study will have impact on how cellular polarity affects locomotion, vision, and underlying causes for neurological diseases.



Dr. James Drake - team leader
The Hospital for Sick Children

Non-invasive treatment of pediatric neurological disorders using MR-guided focused ultrasound (MRgFUS). The investigators aim to develop a next generation non-invasive treatment, MRgFUS, which will allow clinicians to perform "incision-less" surgery by using focused ultrasound energy through the skull. This technique will be used to break up brain damaging blood clots in premature babies, and destroy areas of the brain which cause persistent epileptic seizures.



Dr. Salah El Mestikawy - team leader
McGill University

Dissecting acetylcholine/glutamate co transmission in the striatum: importance of individual neurotransmitter in addiction and movement disorders. The effects of Parkinson's disease and addiction have been linked to acetylcholine secreting neurons called TANS which reside in the striatum region of the brain. The investigators have found that these TANS can communicate in a bilingual manner by secreting acetylcholine which regulates habit formation and motivation, and glutamate regulates drug addiction. By decoding these two languages, the investigators want to better understand this bilingualism and further refine treatments.



Dr. Michael Meaney - team leader
McGill University

Epigenetics and mental health: the Canadian neuroepigenetics network. Research from the Meaney group has previously determined that environmental conditions can alter the structure and function of the genome which in turn affects gene expression. This effect on gene expression is referred to as epigenetics. By integrating the study of epigenetics into psychiatry, this study aims to examine if environmentally-induced epigenetic signals can predict for risk of developing psychopathology in children. Early identification of at-risk individuals may prevent the occurrence of mental illness.



Dr. Roman Melnyk - team leader
The Hospital for Sick Children

Carrier-mediated delivery of therapeutic proteins into the brain. Therapy for various neurological diseases has focused on symptom relief rather than a cure. The blood-brain barrier shields the brain from unwanted chemicals and the body's circulation; however it also blocks drugs from reaching the brain. By using an established carrier molecule that safely enter the brain, the investigators are developing safe and non-invasive approaches to ferry therapeutic drugs and proteins across the blood-brain barrier.



Dr. Freda Miller - team leader
The Hospital for Sick Children

Recruitment of endogenous neural stem cells to promote repair following acquired brain injury in children. There are currently no effective therapies to help brain recovery and reduce disability following a brain injury. The researchers seek to determine if treatment with medication, Metformin, and/or physical exercise can stimulate recruitment of healthy brain stem cells to the site of injury in children and teenagers. By stimulating generation of new brain cells this can lead to new treatments for brain repair.



Dr. Terrance Snutch - team leader
University of British Columbia

Brain channelopathies – target validation and novel therapeutic strategies. Calcium regulates many processes in the body and the entry of calcium into cells is regulated by channels. Calcium channel dysregulation underlie many neurological disorders. The research team will use several animal models with calcium channel dysfunctions to study epilepsy, congenital migraine, schizophrenia and bipolar disorders. In addition, the team will develop novel methods to treat these channel disorders and reduce disease pathology.



Dr. Valerie Wallace - team leader
Ottawa Hospital Research Institute

Restoration of visual function: a cellular reprogramming and bioengineering approach. Retinal degeneration is the loss of photoreceptors in the retina which sense light. Using an animal model of retinal degeneration, the investigators will utilize bio-engineering to develop reliable transplantation methods. In addition, the team are developing strategies of reprogramming patient skin cells into functional photoreceptors. Beyond restoring vision using transplanted cells, the broad application of cellular reprogramming and tissue engineering may be applied to other neurological disorders.

* For the full list of team members for each project, please visit www.braincanada.ca/MIRI

Brain Canada Programs 2013 MIRI Sponsored Opportunity

Highlights

- 52 LOIs received by Feb 11, 2014 deadline
- 30 LOIs advanced to full application stage
- Funding expected to begin in October 2014
- Includes:
 - \$7.5 million partnership to fund research into Alzheimer's disease led by Principal Investigators in BC.
 - Two partnerships with Alberta-based organizations - \$5.6 million to co-fund one team on dementia and healthy brain aging, and \$3 million to co-fund two MIRI teams at least one of which will be focused on mental health.
 - \$3 million partnership to fund one MIRI project studying multiple sclerosis.

The 2013 MIRI Sponsored Opportunity was launched on November 5, 2013. This program is designed to create mutually beneficial opportunities for institutions, voluntary health organizations and provincial agencies to co-fund research teams who qualify, that align with partners' strategic priorities (to support research with a theme, disease and/or geographic focus), and have their funds matched by the federal government.

The Letters of Intent (LOI) submission deadline for the 2013 MIRI competition was on February 11, 2014 and 52 LOIs were received. Research topics covered included Alzheimer's disease, neuro-imaging, brain injury, drug discovery, Autism, and epigenetics. Thirty teams were invited to submit Full Applications and the deadline for Full Applications is June 30, 2014. Funding is expected to begin as early as October of 2014.

Breakdown of 2013 MIRI LOIs

Application Type	#LOIs
Basic	11
Clinical	25
Translational	16

Areas of Research	#LOIs
Mental health	7
Neurodegeneration	24
Neurodevelopment	7
Nervous System	7
Traumatic Brain Injury	3
Other	4

Brain Canada Programs 2013 MIRI Sponsored Opportunity

The following sponsors have agreed to partner with Brain Canada to co-fund 2013 MIRI projects:

British Columbia Alzheimer's MIRI Awards

As part of the 2013 MIRI Sponsored Opportunity, Brain Canada, in collaboration with the Michael Smith Foundation for Health Research (MSFHR), Pacific Alzheimer Research Foundation (PARF) and Genome BC (the BC Partners), launched a \$7.5-million fund to seek solutions to Alzheimer's disease and related dementias, a global public health priority that currently affects up to 70,000 people in the province.

Five teams of leading edge researchers will receive \$1.5 million, three-year grants from the new British Columbia Alzheimer's Research Award program. The grants were open to BC-based investigators for Multi-Investigator Research Initiative (MIRI) projects relevant to Alzheimer's disease and related dementias whose purpose is to accelerate novel and transformative research that will fundamentally change our understanding of nervous system function and dysfunction and their impact on health. Sixteen of the 52 MIRI LOIs received were for the BC MIRI program.

"This is a significant investment in BC in the area of Alzheimer's disease research and one made all the more impactful through this powerful partnership. A greater understanding of this disease will provide more effective treatment tools and better patient outcomes and ultimately lead to more sustainable health care in this important area."

— Dr. Alan Winter
President and CEO of Genome BC

"This opportunity to invest in Alzheimer's disease research is extremely welcome particularly with the strong partnerships involved from British Columbia and Brain Canada. Striving to use research to make a difference ultimately to persons affected by this insidiously progressive neurodegenerative disorder is imperative and BC researchers can make a difference."

- Dr. Lynn Beattie
President of The Pacific Alzheimer Research Foundation

Alberta Partnerships

Brain Canada has developed two partnerships with several organizations in Alberta to co-fund MIRI projects if they are successful in the review process.

The first is a partnership to provide \$5.6 million in support of projects studying healthy brain aging and dementia.

The Partners are:

Alberta Innovates-Health Solutions (AIHS)
Alberta Prion Research Institute (APRI)
Alzheimer Society of Alberta
and North-West Territories
Campus Alberta Neuroscience (Albertaneuro)

The second is a partnership involving Brain Canada, The Hotchkiss Brain Institute and the Mathison Centre for Mental Health Research and Education to provide \$3 million to co-fund two MIRI teams at least one of which will be focused on mental health.

Multiple sclerosis

Brain Canada has also confirmed a partnership with the MS Society of Canada to provide a total of \$3 million (from both partners), to fund one MIRI project studying multiple sclerosis.

Additional partnerships will be announced in the coming months. For more information about Brain Canada's 2013 MIRI Sponsored Opportunities, please email programs@braincanada.ca

Brain Canada Programs

The Azrieli Neurodevelopmental Research Program in partnership with Brain Canada MIRI



Highlights

- Contributions to this fund currently total \$15 million
- 4 grants - \$8.7 million over five years
- Supporting research in Autism Spectrum Disorder and Fragile X syndrome

On December 21, 2012, a partnership between the Azrieli Foundation (of Quebec-Ontario-Israel) and Brain Canada was announced. Through this joint venture, the partners aim to support excellent translational research in the area of neurodevelopmental disorders, with a special focus on Autism Spectrum Disorder and Fragile X syndrome. Fragile X, which affects 1 in 4,000 boys and 1 in 6,000 girls, is the most common inherited cause of intellectual disability and the most common known cause of Autism. Teams of Canadian researchers, or teams involving Canadian and international scientists will be supported. The goal of the initiative is to develop new diagnostics, treatments and prevention strategies for these disorders, to reduce their economic and social burdens on Canadians and to improve the quality of life for those affected and their families.

Following an open call, 31 applications were received from across Canada, and after a rigorous two-stage review process by an expert international Selection Committee, four projects were selected for funding and each will receive up to \$2.5 million over five years. The Selection Committee was chaired by Dr. Simon Baron-Cohen, Professor of Developmental Psychopathology at the University of Cambridge and Director of the Autism Research Centre (ARC) in Cambridge, and included leaders in the field of neurodevelopmental research from around the world. The selection criteria were based on: innovation and originality; multidisciplinary and teamwork; feasibility; and potential for impact through new diagnostic, treatment and prevention strategies for neurodevelopmental disorders.

At the May 1, 2014 announcement, the Azrieli Foundation added \$3.25 million to their original \$4.25 million commitment, and when matched by the Federal Government, bringing the total contributions to this fund to \$15 million.

“We know that Canada is home to some of the world’s foremost neuroscientists and that we have the potential to be a world leader in neurodevelopmental research. By providing scientists with significant financial support, we are providing the lifeblood of advanced research.”

– Dr. Naomi Azrieli
Chair and CEO of the Azrieli Foundation



Dr. Naomi Azrieli, Chair and CEO of the Azrieli Foundation and Dr. Nahum Sonenberg, a recipient of an Azrieli Brain Canada MIRI grant.

Brain Canada Programs

The Azrieli Neurodevelopmental Research Program in partnership with Brain Canada MIRI Grant recipients



Dr. Evdokia Anagnostou - co-team leader
University of Toronto and Bloorview Research Institute

Dr. Jason Lerch - co-team leader
The Hospital for Sick Children
Co-clinical trials in mice and humans in Autism



Autism has been linked to many causes, but it has not been pinpointed to one particular cause. A co-clinical trial in mice and humans will utilize innovative new drugs to determine which treatments work best with which cause. Data from this co-clinical trial will allow the investigators to create personalized treatment plans to benefit patients with autism.



Dr. Alan Evans - team leader
McGill University
Structural and functional networks in Autism Spectrum Disorder and Fragile X syndrome

Childhood disorders such as Autism and Fragile X syndrome are due to abnormal growth and connections in the brain. The investigators will analyze imaging data from over 600 at risk infants to develop the best imaging technique for identifying an early biomarker for Autism and Fragile X syndrome. Determination of this biomarker will suggest strategies for early intervention to reduce impact of these disorders.



Dr. Laurie Doering - team leader
McMaster University
Correction of neuronal function in Autism

Astrocytes are brain cells which manufacture substances to ensure proper communication to all brain cells. However, altered communication may lead to defects responsible for Autism. Using biological and genetic techniques to alter signaling and substances made by astrocytes could correct abnormal communication patterns in the brain which in turn will lead to new treatment strategies for Autism.



Dr. Nahum Sonenberg - team leader
McGill University
Treatment strategies for Autism Spectrum Disorders and Fragile-X syndrome using mouse models, via translational control modulators

Abnormal protein synthesis has been thought to cause the development of Autism and Fragile X syndrome. Mouse models of Autism and Fragile X syndrome will be treated with gene therapy, optogenetics which uses light to control neurons, and innovative drugs to inhibit atypical protein synthesis. Developing new therapies to block aberrant protein synthesis may reverse the effects which cause Autism and Fragile X syndrome.

Brain Canada Programs

Chagnon Family – Brain Canada MIRI: Interventions for Prevention of Alzheimer Disease and Related Disorders

Famille Chagnon

Highlights

- Contributions to this fund currently total \$37.5 million
- Launched May 2012
- Supporting research in **Alzheimer Disease and Related Disorders**

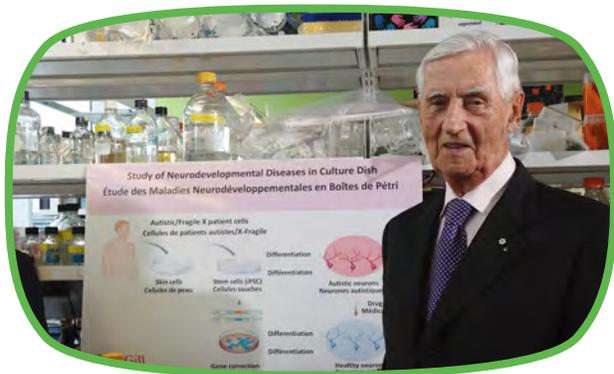
On December 21, 2012, a joint venture between the Chagnon Family of Quebec and Brain Canada was announced. Over the next five years, up to \$37.5 million (of which up to \$25 million will be provided by the Chagnon Family) will support novel and transformative intervention research that will improve the prevention of Alzheimer Disease and Related Disorders (ADRD). This represents the largest single grant in the area of prevention of Alzheimer's disease ever made in Canada.

“Over the past several years, I've come to realize that prevention is the best approach at every level. It is common knowledge that the search for a cure is very costly for society. Our family's desire to get involved in research into Alzheimer's prevention speaks to a family situation that is a big part of our lives and has been for several generations.”

– Mr. André Chagnon, O.C., O.Q.

Following an open call, 23 applications were received from across Canada, and after a rigorous two-stage review process by an expert international Selection Committee, one project was selected for funding. The team will receive \$10 million over five years. The Selection Committee was chaired by Dr. Eric Reiman, Chief Executive Officer of Banner Research and Executive Director of Banner Alzheimer's Institute, and included leaders in the field of Alzheimer prevention. The most important selection criterion was the potential to develop effective strategies for primary and secondary prevention of ADRD, informed by the additional criteria of: innovation and originality; feasibility; and multidisciplinary and teamwork.

At the May 2014 event, it was announced that the Chagnon Family have chosen to invest in the fund for an additional 5 years, so their \$25 million investment will run until 2023. Additional projects will be announced at a later date.



Mr. André Chagnon, O.C., O.Q.

Brain Canada Programs Chagnon Family – Brain Canada MIRI: Interventions for Prevention of Alzheimer Disease and Related Disorders Project summary



Prevention of Alzheimer’s Dementia in high risk population: a randomized controlled trial of a combination of cognitive training and brain stimulation.

Dr. Benoit Mulsant,
Centre for Addiction and Mental Health (CAMH)
\$9,996,087 over five years

Older persons who suffer from mild cognitive impairment (MCI) or from major depression are at a very high risk for developing Alzheimer Disease (AD). This project will study a novel intervention: a combination of cognitive remediation (CR, consisting of memory and problem solving exercises) plus transcranial Direct Current Stimulation (tDCS, a non-painful low electrical current that circulates through the brain of awake patients and stimulates

their neurons) in older persons who suffer from MCI or from a major depression that has been successfully treated with an antidepressant medication. If CR plus tDCS is indeed beneficial in older persons with MCI or major depression, then these treatments can be tested in the general population or in other populations at high risk for AD, with the aim of stopping cognitive decline and preventing the onset of AD.

What is the link between depression and Alzheimer’s disease?

“The link between depression and Alzheimer’s disease is complex and we do not yet understand it fully; this new study will help clarify this relationship. Here is what we know: having an history of depression during one’s early adulthood or late adulthood increases the risk of developing Alzheimer’s disease in late life by two to three-fold; most older persons who are depressed present with some cognitive impairment; cognitive impairment associated with depression does not resolve with successful treatment of depression; and, about a third of patients with Alzheimer’s disease suffer from depression.”

– Dr. Benoit Mulsant

Brain Canada Programs May 1 announcement

On May 1, 2014 at an event at Palais des Congrès in Montreal, Prime Minister Stephen Harper, along with members of the Chagnon Family and Azrieli Foundation, and representatives from Brain Canada, announced the funding of five research projects one focused on Alzheimer Disease

prevention, and four in the area of Autism Spectrum Disorder and Fragile X syndrome. The Azrieli Foundation also announced an additional \$3.25 million funding towards the Azrieli Neurodevelopmental Research Program, which will be matched by the Government of Canada.



Top left:
Claude Chagnon, The Rt. Hon. Stephen Harper,
André Chagnon, Dr. Michel Boivin.

Bottom left:
Mr. André Chagnon, Dr. Naomi Azrieli, Dr. Benoit Mulsant,
The Rt. Hon. Stephen Harper, Dr. Nahum Sonenberg

Bottom right:
Dena Libman, The Hon. Herbert Marx, Dr. Naomi Azrieli,
The Rt. Hon. Stephen Harper, Stephanie Azrieli, Myer Bick,
and Mary Mellas.



“The five neuroscience projects being announced today are only possible due to the generosity of the Azrieli Foundation and the Chagnon Family and matching funds from the Government of Canada. These initiatives hold the potential to dramatically improve the lives of those suffering from Alzheimer’s and Autism.”

– Prime Minister Stephen Harper speaking at the May 1 announcement

“The Canada Brain Research Fund leverages philanthropic and government dollars to significantly increase funding to Canadian researchers. We thank the Prime Minister for his interest in our Program and for joining us in this announcement. We are greatly encouraged by the government’s support for neurodevelopment which is a key focus for the Azrieli Foundation.”

– Dr. Naomi Azrieli, Chair and CEO of the Azrieli Foundation

Brain Canada Programs Platform Support Grants (PSGs)

High-impact research in neuroscience and mental health has always required skill, imagination, determination and insight, and nowadays it also requires access to shared equipment, facilities, services, databases, computing and informatics facilities, patient repositories, and biobanks, collectively referred to as technology “platforms”. Such platforms are too expensive for a single research laboratory or program to purchase or maintain, and are complex and highly sophisticated. They need to be operated and regularly maintained by skilled technical staff to ensure they operate at peak performance and efficiency and are accessible on demand. Some are of such large scale that they should only be provided on a regional or national basis.

Brain Canada identified support for operations and maintenance of research platforms as a gap in the research funding environment for the neurosciences, and now intends to address this funding gap by delivering a competition for Platform Support Grants (PSGs).

On November 1, 2013, Brain Canada announced its call for applications for the 2013 PSGs Sponsored Opportunity. These grants will support major research platforms that provide national or regional technical capability to multiple neuroscience investigators from a number of institutions. Examples could include brain banks, clinical trials networks, imaging facilities, transgenic animal facilities, specialized high-throughput genomics facilities, drug discovery platforms, data repositories and data-sharing systems. The linking and coordination of existing local or regional facilities into a national resource or network is especially encouraged under this scheme, as is the integration of Canadian resources into an international platform or consortium, as long as these actions improve its accessibility and utility to Canadian investigators. The deadline for receipt of applications was April 11, 2014 and 31 applications were received by that date. Applications will undergo a rigorous peer review process and funding for successful applications is expected to begin as early as July of 2014.

Breakdown of Platform Support Grant Applications

Categories	# Applications
Biobank, brain bank, data repository	4
Clinical data, trial, pre-clinical trials and models	8
Core facility (cell lines)	2
High-throughput screen	3
Imaging facility	13
Informatics	4
KT platform	1
Proteomics	1

Disease categories / areas of research	# Applications
Addiction	1
Basic neuroscience	2
Broad	9
Epilepsy	1
Mental Health	4
Neurodegeneration	8
Neurodevelopment	2
Traumatic brain injury, spinal cord injury	4

Brain Canada Programs Training Awards

Brain Canada's Training Awards are designed to promote the next generation of Canadian neuroscience researchers by providing them with guidance, mentorship and training under the direction of world-leading researchers. A significant investment in Canada's most promising researchers, these funds will accelerate their progress and contribution to our understanding of the brain.

The first Training Awards competitions were launched August 1, 2012. There were two research themes: Mental Health and Brain Cancer. Bell is the corporate partner for Mental Health; CIBC is the

corporate partner for Brain Cancer. Each company provided \$500,000, which was matched by the Canada Brain Research Fund for a \$1-million allocation per theme. Following a national review of applications, seven awards—three fellowships and four studentships—were selected for each theme. Fellows received \$50,000 per year for three years plus a \$5,000 per year career development supplement. Students received \$30,000 per year for three years, plus a \$5,000 per year career development supplement. The next Brain Canada Training Awards program is currently in development.

Canadian Imperial Bank of Commerce (CIBC) - Brain Canada Brain Cancer Training Awards recipients



Fellowships

RECIPIENT	SUPERVISOR	INSTITUTE	TITLE
Deena Gendoo	Dr. Benjamin Haibe-Kains	The Hospital for Sick Children	Determining the role of non-coding RNA in molecular phenotypes of embryonic brain tumours using a global systems and informatics approach
Nadine Richard	Dr. Kim Edelstein, Dr. Lori J. Bernstein	Pencer Brain Tumour Centre, Princess Margaret Hospital	Validation of a cognitive rehabilitation program adapted to the needs of adults with brain cancer and adult survivors of childhood brain cancer
Katherine Rowland	Dr. Peter B. Dirks	The Hospital for Sick Children	Role of YAP/Hippo and Wnt signaling in human gliomagenesis and glioma tumour-initiating cells

Studentships

RECIPIENT	SUPERVISOR	INSTITUTE	TITLE
Vincy Chan	Dr. Angela Colantonio	University of Toronto	The profile and trajectory of brain tumours across the continuum of care in Ontario, Canada: a population based study
Ian Gerard	Dr. D. Louis Collins	Montreal Neurological Institute	Nonlinear MR-US registration for image guided institute neurosurgery of brain tumours
Nishani Rajakulendran	Dr. Stephane Angers	University of Toronto	Wnt signalling circuits in glioma progression
Mohini Singh	Dr. Sheila K. Singh	McMaster University	Identification of brain metastasis initiating cells and regulators of brain metastasis from lung cancer

Bell Mental Health Research Training Awards recipients



Fellowships

RECIPIENT	SUPERVISOR	INSTITUTE	TITLE
Cornelia Walther	Dr. Stephen Ferguson	University of Western Ontario	CRF receptor-mediated sensitization of 5-HT _{2A} receptor signalling
Guang Yang	Dr. Freda Miller	The Hospital for Sick Children	The role of translational control in cortical dysgenesis in mammalian brain
Steven A. Connor	Dr. Anne Marie Craig; Dr. Yu Tian Wang	University of British Columbia	Characterization of the role of LRRTMs in synaptic plasticity and memory formation

Studentships

RECIPIENT	SUPERVISOR	INSTITUTE	TITLE
Nancy Butcher	Dr. Anne Bassett	University of Toronto	Antipsychotic treatment in a genetic subtype of schizophrenia: Novel insights from neuroimaging and pharmacogenetics
Andrea Tyrer	Dr. Jeffrey Meyer	Centre for Addiction and Mental Health	Season, light exposure and serotonin transporter binding
Jennie Pouget	Dr. James Kennedy	Centre for Addiction and Mental Health	Role of variants of the translocator protein (TSPO) gene in schizophrenia and antipsychotic-induced weight gain
Corey Baimel	Dr. Stephanie Borgland	The University of British Columbia/ Hotchkiss Brain Institute – University of Calgary	The effects of optogenetically activated orexin/hypocretin neurons on the mesolimbic reward pathway

Progress highlights from Training Awards recipients



Ms. Nancy Butcher
Bell Mental Health Student

Antipsychotic treatment in a genetic subtype of schizophrenia: Novel insights from neuroimaging and pharmacogenetics. Ms Butcher is trying to identify genetic and phenotypic markers to predict treatment response and side effects which mimic symptoms of Parkinson’s disease (PD) due to antipsychotic treatment of schizophrenia. She is specifically investigating a particular deletion on chromosome 22 (22q11.2DS) which she has previously identified as a high risk marker for PD and is also a molecular subtype for schizophrenia. She has so far completed the first systemic evaluation of antipsychotic response with patients carrying the 22q11.2DS marker. She has submitted a manuscript of these findings. Her second and third projects are underway and she is currently collecting imaging and whole genome sequencing data.



Ms. Andrea Tyrer
Bell Mental Health Student

Season, light exposure and serotonin transporter binding. Ms Tyrer is conducting a longitudinal study on seasonal affective disorder (SAD) and the role of serotonin transporter 5-HTT. To assess differences between SAD and healthy individuals, Ms Tyrer utilises PET scanning to visualise seasonal changes in 5-HTT levels. She has recruited and scanned nearly half of her participants for both the SAD and healthy participants. Her preliminary findings indicate marked differences in 5-HTT between SAD and healthy participants in different regions of the brain. She will complete recruitment and begin the light therapy in the coming year.

Ms Tyrer has presented her initial findings twice in oral presentations. She has been able to use her career development supplement for biomedical image quantification training and networking with senior scientists in neuropsychopharmacology.

Brain Canada Programs

Brain Repair Program

The Canada Brain Research Fund was built on the success of Brain Canada's signature Brain Repair Program, launched in November 2003, which was aimed at accelerating collaborative, multidisciplinary, multi-institutional brain repair research. Five teams were selected through an open call process and national and international peer review, and each received \$1.5 million over three years. This program enabled world-class Canadian researchers across the country to form highly focused teams, and to make a number of important breakthroughs.

All five teams made major discoveries within the term of their grants. One of the projects selected in the second competition was Uncovering the

causes of Parkinson's Disease, led by Dr. Louis-Éric Trudeau at the Université de Montréal. When funding for this project ended in 2010, Dr. David Park, a member of the team, submitted a request to continue a key component of the project. The external review recommended that this project continue as it was assessed to have a high potential for breakthroughs. The Krembil Foundation, with matching funds from the Canada Brain Research Fund, is providing the team with three additional years of funding. The team continues to make outstanding progress on their project. Over the past year they have published three articles in highly-respected journals and have an additional four manuscripts in submission.

Uncovering the causes of Parkinson's Disease



Dr. David Park
University of Ottawa



Dr. Ruth Slack
University of Ottawa



Dr. Louis-Éric Trudeau
University of Montreal

The team has made exciting discoveries on how Parkinson's Disease (PD) genes act to regulate dopaminergic survival and function. Importantly, they show how genes such as DJ-1 act to regulate targets which in turn mediate neuronal survival and oxidative stress.

They also defined how mitochondria, the powerhouse of the cell which also regulate critical intra-

cellular signals, may function to regulate health of neurons in PD. Insights provided by these studies provide critical clues into how mitochondrial proteins such as AIF, Pink, and Opa may regulate mitochondrial structure, metabolism, and survival.

Finally, the studies have generated exciting ideas on factors which may affect the sensitivity of select neuronal populations to degeneration in PD.

“The interaction of these three laboratories is synergistic and the investment that Brain Canada made in these Investigators has and will continue to pay scientific dividends. Their data should ultimately contribute to the collective understanding of Parkinson's disease and hopefully novel therapeutic strategies.”

– International reviewer for Brain Repair Program grants

Brain Canada Programs

Communications training for researchers

The RBC Foundation provided funding to support media and communications training to researchers previously or currently funded by Brain Canada. Brain Canada, working with NATIONAL Public Relations Inc., planned and delivered four training sessions in May of 2012, July and August of 2013 and May 2014. These sessions focused on making

complex science concepts accessible to broader audiences outside of the research community. All participants agreed that the skills and techniques learned during the sessions will be very useful to them in communicating about their research to both scientific and non-scientific audiences.



Nadine Richards,
Post-doctoral Fellow,
Princess Margaret
Hospital

Recipient of Canadian
Imperial Bank of
Commerce (CIBC) -
Brain Canada Brain
Cancer Training Award
fellowship

"While my doctoral training offered excellent preparation for doing research and communicating with my peers, we never really learned how to reach a broader audience. As the ultimate goal of my research is to improve health outcomes for Canadians, they represent a major stakeholder in the research process. I feel this extra media and communications training has improved my ability to connect with the public, to translate the knowledge we gain and hopefully stimulate public engagement in brain health research."

Barbara Turnbull Award for Spinal Cord Research

This award, in support of Canadian research on spinal cord injury, is funded by the Institute of Neurosciences, Mental Health and Addiction (INMHA) of the Canadian Institutes of Health Research (CIHR) in partnership with Brain Canada and the Barbara Turnbull Foundation, and is valued at \$50,000. The award recipient is judged, from among the CIHR-funded investigators each year, to be conducting the most promising and exciting research in this area.

The 2013 recipient of the Barbara Turnbull Award for Spinal Cord Research was Dr. Frédéric Bretzner of the Centre hospitalier universitaire de Québec Research Center in Quebec City. The award will be formally presented to Dr. Bretzner at a ceremony in November of 2014.



Frédéric Bretzner,
Ph.D.
Recipient of 2013
Barbara Turnbull
Award for Spinal
Cord Research

Motor control: Brainstem control of locomotion

Project description: Although the spinal cord contains all the circuitry necessary for locomotion, due to the absence of commands from the brain, people with spinal cord injuries are unable to walk. Motor recovery can be partially achieved by strategies or therapies intended to regenerate axons from the brain to the spinal cord. Some of these approaches have reported such promising results in animal models that clinical trials are currently underway. However, a major obstacle to achieving this goal is the lack of identification and characterization of appropriate targets at the brain and spinal cord levels, as well as the lack of knowledge of the mechanisms of plasticity of these targets. Dr. Bretzner's project aims to investigate the pathways between the brain and the spinal cord that are important for initiation and modulation of locomotion. This will allow for the identification and characterization of the nervous circuits that need to be repaired in order to improve functional recovery following spinal cord injury or neurotrauma affecting gait.

Brain Canada Programs

Dr. Hubert van Tol Travel Fellowship

The neuroscience community lost a brilliant scientist when Dr. Hubert van Tol died suddenly in a bicycle accident on April 20, 2006. Dr. van Tol was an internationally recognized and respected neuroscientist who received numerous awards and greatly advanced the entire field of molecular neurobiology. To honour him, his family set up the Dr. Hubert van Tol Fund at Brain Canada, through which the Dr. Hubert van Tol Travel Fellowship was established. The fund has received more than \$30,000 in donations since it was established. The fellowship enables Ph.D. students and post-doctoral fellows performing research as part of a Brain Canada MIRI team or Training award to attend major international conferences, symposia or training courses outside of Canada. This is consistent with Dr. van Tol's belief in the importance of international experiences.

Report on 17th annual University of Toronto – Karolinska Institute Exchange course in Developmental and Perinatal Biology

"I had the opportunity to learn about cutting edge techniques and recent advancements in the fields of embryonic and induced pluripotent stem cell research, brain development and the use of brain stem cells in brain repair as well as the epigenetic regulation of human disease and its developmental origins. Additionally, I was also able to participate in the workshop on research ethics and integrity.

Now that I am back in Toronto, I have already begun to utilize my newly-acquired knowledge in the laboratory. I am currently examining directions to

The winner of 2013 Dr. Hubert van Tol Travel Fellowship was Anastassia Voronova. She is a post-doctoral student in the Developmental and Stem Cell Biology Department of The Hospital for Sick Children in Toronto, Ontario. She used her travel fellowship to attend the University of Toronto – Karolinska Institute Exchange course in Developmental and Perinatal Biology course August 18-24, 2013 in Stockholm, Sweden.

Brain Canada is honoured to be associated with the Dr. Hubert van Tol Travel Fellowship, through which we are recognizing Dr. van Tol's continued legacy. The family and supporters of this fellowship would like to ensure that a total of ten annual awards are given, each valued at up to \$5,000.

improve the validity and interdisciplinary nature of not only my project, but other projects in the laboratory of Dr. Freda Miller. Moreover, the contacts that I was able to establish will help me greatly in achieving collaborations that will last well into the future. I believe the experience has not only advanced my successful track at the Hospital for Sick Children, but will also help me to develop an important neurodevelopmental research program that will allow me to establish myself as an independent principal investigator in Canada."



Anastassia Voronova,
Ph.D.
2013
Dr. Hubert van Tol
Travel Fellowship
recipient

Stakeholder consultations

In 2013, Brain Canada undertook a series of consultations with researchers, clinicians, patients/families (directly or through stakeholder organizations), philanthropists, and decision makers to help inform the research program of the Canada Brain Research Fund (CBRF). This project was made possible through a generous grant from the Max Bell Foundation. The goal of the consultation process was to help ensure that the CBRF: (i) increases understanding of the brain; (ii) is relevant to and has the support of patients living with a neurological disorder or disease, mental illness or addiction, and (iii) will have the greatest potential for the development of new and better therapies, and eventually cures.

Consultations took place in Calgary, Vancouver, Toronto, Montreal and Halifax throughout 2013. The consultation process was very positive and helped to outline gaps in brain research across the country and internationally and provide insight as

to where Brain Canada might be able to address the current situation. Participants in the consultations cited funding, lack of application of scientific knowledge, investments in training, and the lack of a big picture synthesis in neuroscience as major challenges facing brain research today both in Canada and internationally. There was significant agreement throughout the consultations that Brain Canada could address these challenges and gaps by supporting high-risk, high-reward projects. Other suggested actions included creating opportunities to bring together the community, engaging funders and the public, and coordinating the work that is currently being done in order to maximize its impact.

Brain Canada is studying the reports from the consultation process. Insights garnered from the consultations will help in guiding the focus of Brain Canada's and the CBRF's upcoming research programs and awareness activities.

Parlour dinners

Thanks to a generous \$100,000 contribution from the RBC Foundation, Brain Canada organized a series of intimate parlour meeting dinners to raise awareness about our work to promote Canadian brain research. A total of five dinners took place across Canada. The first three dinners took place in Toronto, Calgary and Montreal in 2012 and early 2013.

The fourth dinner was held in Vancouver on September 30, 2013 and featured a presentation by Dr. Terrance P. Snutch, a recipient of a 2012 MIRI grants. His topic was *Turning down the hyperactive brain* and he discussed how nerve cell hyperexcitability is an underlying mechanism

common to many brain disorders including epilepsy, migraine and Autism, and why this condition occurs. The event was co-Chaired by Brain Canada Director Brandt C. Louie and David Bustos, Managing Director, RBC Capital Markets.

The last dinner was held in Halifax on February 11, 2014. The keynote speaker was Dr. Stan Kutcher, and his topic was *School mental health: mental health literacy and mental health care for young people*. The event was co-Chaired by Brain Canada Chair Rupert Duchesne and Ed Steeves, Regional Vice President, RBC Wealth Management.

Parlour dinners

These events were possible thanks to the generous support of the RBC Foundation



RBC Foundation
RBC Fondation

Vancouver dinner - September 30, 2013



Max S. Cynader, Diane Finegood



From left to right: Franco J. Vaccarino, Mark Krembil, Neil Cashman



From left to right: Vincent Castellucci, Brian MacVicar, Allan R. Taylor, Terrence Snutch



From left to right: Dan Goldowitz, David R. Kaplan, David Bustos, Max S. Cynader



From left to right: Brandt Louie, Catherine Zahn, David Bustos



From left to right: Brandt C. Louie, David Bustos, Allan R. Taylor



Inez Jabalpurwala, Brandt C. Louie



From left to right: David R. Kaplan, Heather Craig, Freda Miller

Halifax dinner - February 11, 2014



Nicholas Delva, Ed Steeves



Bernard Imbeault, Lili de Grandpré



Fred Fountain, Rupert Duchesne



Françoise Baylis



From left to right: Rupert Duchesne, Elizabeth Fountain, Fred Fountain



Stan Kutcher



Ed Steeves



Guests at the dinner

Partnership Development

Partnerships are a central component of the Canada Brain Research Fund (CBRF) and Brain Canada is committed to working with strategic funding partners with interests across the entire range of neurological diseases and injuries, mental illnesses and addictions. Partners include universities, research institutes, hospitals, voluntary health

organizations, federal granting councils and provincial agencies—many featured throughout this report.

We highlight below two partnerships which have enabled Brain Canada to expand our expertise and network.

The CQDM/Brain Canada Partnership's "Focus on Brain" program

The Quebec Consortium for Drug Discovery/Brain Canada Partnership's "Focus on Brain" program is a major funding opportunity that launched on May 26, 2014. It is open to multidisciplinary research teams linking Quebec and other Canadian researchers, and the academic and small and medium-sized enterprise ("SME") sectors. Through this program we expect to identify, fund, and support the development of breakthrough technologies that enhance biopharmaceutical R&D productivity and accelerate the development of new, safe and effective drugs for disorders of the brain and nervous system.

Three-year grants of up to \$1.5 million will be awarded to approximately 7 teams proposing to **develop innovative technologies, platforms or tools** that can facilitate the discovery or the development of new drugs for application in preventing, diagnosing, or treating disorders and diseases of the brain, nervous system and special senses, including mental health disorders. Successful proposals will have outcomes with immediate application to the process of drug discovery and/or development, with potential for wide impact on biopharmaceutical research.

Brain Canada - Canadian Cancer Society Impact Grants

Brain Canada has partnered with the Canadian Cancer Society (CCS) to support more CCS Impact Grants focused on brain and nervous system cancer research. The Impact Grant program is intended to contribute to the scientific idea 'pipeline' by supporting significant progression in cancer research, from individual investigators or multidisciplinary teams, that are anywhere in the continuum from basic high impact discovery to translational work of direct relevance to the clinic. Brain Canada will match the Canadian Cancer Society's contributions dollar for dollar with funds from the Canada Brain Research Fund, to support projects in brain and nervous system cancer research.

Brain Canada's hope is that this unique partnership between two leading research funders will result in increased investments in brain and nervous system cancer research and will encourage collaboration and cross cutting between scientists from the cancer and neuroscience fields. The deadline for receipt of Letters of Intent was March 25, 2014 and invitations to submit Full Applications will be issued in June 2014. Grant recipients can receive up to \$250,000 per year, to a maximum of \$1,250,000 per grant. The grant term is up to five years. Funding is expected to begin in February of 2015.

Fundraising

With the launch of the Canada Brain Research Fund public-private partnership in 2012, Brain Canada embarked on a \$100-million, national fundraising campaign. All funds raised from private and non-governmental sources over six years are matched by Government on a 1:1 basis. Brain Canada will focus our efforts on major donors and partnerships. The fundraising total on December 31, 2013 was \$35.625 million.

Brain Canada encourages all organizations raising funds for brain research to either contribute

directly to the fund and have their donor dollars matched, or to partner on research programs to further leverage the public-private match.

Brain Canada has always taken pride in keeping non-research related expenses to the minimum required for operation efficiency and good governance. Brain Canada Directors have also made generous gifts to operations. Through these efforts, ninety percent of every dollar raised is disbursed directly to Canadian researchers.

Thanks to our supporters across the country

We would like to gratefully acknowledge the following individuals, foundations and corporations.

Canada Brain Research Fund donors

Individuals and private Foundations

Lead donors

The Chagnon Family - \$12.5 million
The Azrieli Foundation - \$7.5 million
The W. Garfield Weston Foundation - \$3 million
The Krembil Foundation - \$1 million

\$100,000 – \$249,000

The Max Bell Foundation
The Jim Pattison Foundation
The Rotman Family Foundation
The Lawrence and Judith Tanenbaum Foundation

\$50,000 – \$99,999

Michael H. Wilson

\$25,000 – \$49,999

Rupert Duchesne
Marianne Seger
Allan R. and Shirley Taylor

\$10,000 – \$24,999

The Ira Gluskin & Maxine Granovsky Gluskin Charitable Foundation
The Hon. John and Mrs. Joan MacKenzie
The Barbara Turnbull Foundation

Corporations

\$500,000

Bell
CIBC

\$200,000

National Bank of Canada

\$100,000

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RBC Foundation

Gifts were made to honour

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Science Advisory Forum

In 2013, the Science Advisory Forum (SAF) was created to provide key input to Brain Canada's Board Research Policy Committee in the form of intelligence about developments in the field, in Canada and internationally, and a broad assessment of Brain Canada's research program. The SAF, a combined Canadian and international committee, replaces the Science Advisory Council and International Science Advisory Council that were dissolved in 2013. The SAF will be composed of 14 to 20 members, half from Canada, half international,

Chair

Brian MacVicar, Ph.D.

Professor, Dept. of Psychiatry
University of British Columbia

Area of expertise: Neural Excitability, Synapses, and Glia: Cellular Mechanisms

Members

Yves De Koninck, Ph.D.

Professor, Dept. of Psychiatry & Neuroscience, Laval University
Adjunct Professor, Dept. of Pharmacology & Therapeutics
McGill University

Director, Division of Cellular & Molecular Neuroscience,
Institut universitaire en santé mentale de Québec
Scientific Director, Quebec Pain Research Network

Area of expertise: Neural Excitability, Synapses, and Glia: Cellular Mechanisms

Jacques Drouin, D. Sc., MRSC

Director, Molecular Genetics research unit, IRCM
Research Professor, Dept. of Biochemistry
Université de Montréal

Adjunct Professor, Dept. of Anatomy and Cell Biology,
and Dept. of Biochemistry
McGill University

Area of expertise: Integrative Systems: Neuroendocrinology, Neuroimmunology and Homeostatic Challenge

Alan C. Evans, Ph.D.

Professor, Dept. of Neurology and Neurosurgery,
Biomedical Engineering, Medical Physics
McGill University

Area of expertise: Disorders of the Nervous System

Lesley K. Fellows, MD, DPhil

Associate Professor, Dept. of Neurology & Neurosurgery
Montreal Neurological Institute

Area of expertise: Neurologist

Kurt Haas, Ph.D.

Associate Professor, Dept. of Cellular and Physiological Sciences
University of British Columbia

Area of expertise: Model organisms and systems

but all members having international stature. The SAF will include broad representation across the neurosciences, and may include members outside of this field. SAF members will serve as ambassadors, helping to raise the profile of Brain Canada and its research program, and to make links and connections with the scientific community and receive their feedback. The Canadian portion of the SAF has been recruited and Brain Canada is in the process of recruiting the international component.

Sheena Josselyn, Ph.D.

Senior Scientist, Neurosciences & Mental Health Program
Hospital for Sick Children Research Institute
Canada Research Chair in Molecular and Cellular Cognition
Associate Professor, Dept. of Physiology
Institute of Medical Science
University of Toronto

Area of expertise: Cognition and Behaviour

James L. Kennedy, MSc, MD, FRCP(C), FRSC

Director of the Neuroscience Research Department
and Head of the Psychiatric Neurogenetics Section
Centre for Addiction and Mental Health (CAMH)

Area of expertise: Genetics

Bryan E. Kolb, Ph.D.

Professor, Dept. of Neuroscience
University of Lethbridge

Area of expertise: Cognition and behaviour

Stan Kutcher, MD, FRCPC, FCAHS

Sun Life Financial Chair in Adolescent Mental Health
Professor, Dept. of Psychiatry
Dalhousie University

Area of expertise: Cognition and behaviour

Freda Miller, Ph.D.

Senior Scientist, Neurosciences & Mental Health
Hospital for Sick Children
Professor, Dept. of Molecular Genetics
University of Toronto
Canada Research Chair in Developmental Neurobiology

Area of expertise: Development

Doug P. Munoz, Ph.D.

Professor of Physiology, Psychology and Medicine
Queen's University
Director, Queen's Centre for Neuroscience Studies
Canada Research Chair in Neuroscience

Area of expertise: Sensory and Motor Systems

Rachel F. Tyndale, Ph.D.

Professor, Dept. of Pharmacology & Toxicology
University of Toronto
Endowed Chair in Addictions, Dept. of Psychiatry
University of Toronto
Head Pharmacogenetics, Centre for Addiction
and Mental Health (CAMH)

Area of expertise: Addiction

2013 Partnership and Foundation Financial Report

NeuroScience Canada Partnership Brain Canada Foundation Combined Financial Statements

At December 31	2013 \$	2012 \$	For the year ended December 31	2013 \$	2012 \$
ASSETS			REVENUES		
Current Assets			Contributions		
Cash and cash equivalents	5 182 679	14 786 452	2 776 030	3 512 447	
Short term investments, including accrued interest	28 816 530	10 513 287	Add amount recognized	935 216	
Other receivables	45 496	58 261	(Less deferred amount)	-	(1 998 767)
Prepays and deposits	97 566	74 191		3 711 246	1 513 680
	34 142 271	25 432 191	Other contributions	-	24 315
Computer equipment	5 733	7 068		3 711 246	1 537 995
	34 148 004	25 439 259	Interest income	4 677	4 006
			Total Revenues	3 715 923	1 542 001
LIABILITIES			EXPENDITURES		
Current liabilities			Grants and awards		
Accounts payable and accrued liabilities	35 514	152 926	2 079 225	452 115	
Salaries and benefits payable	125 228	77 033	Operating expenses	1 634 573	1 088 124
Deferred contributions	1 353 776	2 288 992	Amortization	2 429	1 921
	1 514 518	2 518 951		3 716 227	1 542 160
Non-current liabilities			Unrealized loss from investments, measured at fair value		
Deferred contributions	32 526 417	22 812 935	-	(128 571)	
			Total Expenditures	3 716 227	1 670 731
NET ASSETS			Excess of expenditures over revenues		
Unrestricted net assets	101 336	100 305	(304)	(128 730)	
Invested in computer equipment	5 733	7 068			
	107 069	107 373			
	34 148 004	25 439 259			

The financial statements of NeuroScience Canada Partnership and Brain Canada Foundation are audited by KPMG LLP and are available upon request.