





THE BRAIN REPAIR CENTRE (BRC),  
A DALHOUSIE UNIVERSITY INSTITUTE,  
IS THE HUB FOR MEDICAL NEUROSCIENCE  
RESEARCH IN EASTERN CANADA.

### **MISSION**

PROVIDE PROGRAMS AND SERVICES  
TO ADVANCE NEUROSCIENCE DISCOVERY,  
IMPROVE NEUROLOGICAL CLINICAL CARE AND  
CONTRIBUTE TO THE NOVA SCOTIA ECONOMY  
THROUGH RESEARCH, INNOVATION AND  
WORLDWIDE PARTNERSHIPS.

### **VISION**

TO BE THE PREMIER NEUROSCIENCE  
RESEARCH AND INNOVATION CENTRE  
IN CANADA BY ATTRACTING THE BEST  
NEUROSCIENTISTS IN THE WORLD  
DOING RESEARCH IN NEUROLOGICAL  
DISEASES AND DISORDERS.

SECURED  
\$19+ MILLION IN  
FUNDING IN 2018

HAVE EMPLOYED  
400+ TRAINEES  
AND STAFF TO DATE



**BRAIN REPAIR  
CENTRE RESEARCHERS**

HOLDING OR  
ARE PURSUING 53  
INNOVATION PATENTS

SUPERVISED  
550 MASTERS AND  
PHD STUDENTS

### RESEARCH CLUSTERS

- Mobility (e.g. ALS, stroke and spinal cord injury)
- Neurodegeneration (e.g. Parkinson's, Alzheimer's, Huntington's and multiple sclerosis)
- Neurodevelopment (e.g. autism and schizophrenia)
- Traumatic brain injuries

### BRC FUNDING PARTNERS

- Nova Scotia Labour and Advanced Education
- Dalhousie University – Faculty of Medicine
- Dalhousie Medical Research Foundation
- QEII Foundation



Dear Colleagues,

From facilitating ground-breaking research to sparking the scientific curiosity of grade 6 students, the Brain Repair Centre has had an eventful year.

Throughout the year, we moved forward with our mandate to support our local researchers while connecting our local work to the global neuroscience community. We did this through direct funding, creating connections, fostering commercialization and helping to define the direction of Canada's national neuroscience research.

This year we saw an increase in both our scope of work and volume of activities, from our Journal Clubs to hosting research meetings. The Brain Repair Centre upheld its role as Atlantic Canada's hub for neuroscience research to the fullest extent.

We finished the year with creating a new strategic plan that sets lofty goals and is centred on building a strong and prosperous future for our researchers. The strategy has three pillars of work: collaborative and innovative research, commercialization through strategic partnerships and attracting and retaining talented researchers.

With support from our capable team, a new strategic plan, and continued funding from our partners, we are well positioned for a successful year ahead. I look forward to working with our researchers and partners in the exciting years ahead.

We encourage you to read this annual report to learn more about our work and aspirations.

Sincerely,

A handwritten signature in black ink, appearing to read "Vic Rafuse".

Dr. Vic Rafuse  
Director, BRC



## BRC HOSTS FIRST-EVER NATIONAL NEUROSCIENCE LEADERSHIP FORUM

In September 2018, 27 neuroscience researchers from across Canada enthusiastically responded to the Brain Repair Centre's invitation to put their heads together to discuss neuroscience research in Canada. The event hosted participants from the major brain research centres in Canada, including a number of Canada First Research Excellence Fund (CFREF) researchers that pertain to neuroscience. The first-ever national neuroscience leadership forum created the opportunity for leading neuroscience researchers to discuss their

work and visions for the future. The meeting concluded with unanimous consent to develop a national brain strategy – the Canadian Brain Research Strategy. BRC Director, Dr. Vic Rafuse, is working with colleagues across Canada to develop the strategy. The national strategy will advance neuroscience research in a coordinated and strategic way and is expected to open new doors to research funding. To learn more, visit [canadianbrain.ca](http://canadianbrain.ca).

## **DAL NAMES BRC A WAVE 1 RESEARCH GROUP**

This past summer, Dalhousie Medical School named the Brain Repair Centre as one of its Wave research teams. Dalhousie Medical School describes the Wave program as an opportunity to “reveal the medical school’s strongest research teams, uncover their aspirations, and identify what they need to take their work to the next level of productivity and impact.” In addition to being named a Dalhousie institute, the Wave 1 recognition further acknowledges BRC as a leading research team.

## **DALHOUSIE/BEN-GURION UNIVERSITY (ISRAEL) STUDENT EXCHANGE PROGRAM**

The BRC is coordinating a new Dalhousie/Ben-Gurion University (BGU) student exchange program. The program will see students travelling to Israel’s BGU, where they would shadow a Primary Investigator (PI) with complementary research interests. In return, BGU students will visit Dalhousie and likewise assist in research initiatives led by Dalhousie investigators. Dalhousie’s Medical Research Foundation and secured philanthropists will fund the program’s initiation, with additional funds being secured by the BRC through Globalink, a Mitacs program which funds international travel for research.

## **MARITIMES ON THE MOVE**

The Atlantic Mobility Action Project (AMAP) annual meeting was held in September 2018 at Whitepoint Beach Resort, NS. Members of the AMAP group – Primary Investigators and trainees from Nova Scotia and New Brunswick – were invited to present at the two-day conference which was attended by 35 guests, including two keynote speakers from the University of Alberta: Dr. Monica Gorassini and Dr. David Bennett. Areas of research covered sensory motor, molecular stress, biomechanics and engineering, motor and cortical circuits, and spinal cord injury. The sessions were chaired by trainees, giving them an opportunity to build their skills.

We are planning the 2019 edition of this event and have received interest from investigators at Cassidy Centre at University of Prince Edward Island as well as the group from the University of New Brunswick who are planning to return.

## BRC SUPPORTS STUDENT RESEARCHERS

The BRC supported six student researchers to expand their knowledge and build national relationships by attending national and international neuroscience conferences. Collectively, the students were awarded \$5,000 to help offset the costs of attending the conferences.

STUDENT	SUPERVISOR	CONFERENCE
Han Zhang	Dr. Ying Zhang	SfN 2018 (Society for Neuroscience)
Dylan Deska-Gauthier	Dr. Ying Zhang	SfN 2018
Olivier Laflamme	Dr. Turgay Akay	SfN 2018
Lyam Bailey	Dr. Aaron Newman	Canadian Society for Brain, Behaviour and Cognitive Science Conference (CSBBCS)
Antonios Diab	Dr. James Fawcett	International Behavioural and Neural Genetics Society (IBANS) Annual Meeting
Ralph Redden	Dr. Ray Klein	VSS 2018: Vision Sciences Society International Workshop

## PROMOTING INDUSTRY PARTNERSHIP

BRC is producing new promotional material designed to encourage industry partnership with BRC researchers. As part of the Dalhousie School's Centralized Operation of Research Equipment and Support (CORES) program, BRC has access to sophisticated laboratory research facilities. The facilities, complemented by leading-edge expertise, create an ideal environment for industry partnerships. BRC's expertise in animal behaviour for assessing movement disorders, anxiety and neurodegenerative disorders and its state-of-the-art imaging facilities for neuropathological research (CMDI) are just two examples of where potential industry partnerships are viable. BRC will be promoting these partnership opportunities in 2019 with a goal to increase awareness of Nova Scotia neuroscience research and secure new industry partnerships and funding.



## \$650,000 GRANT FOR INTERNATIONAL BRAIN INJURY RESEARCH

Through BRC's leadership, lead researchers Dr. Alon Friedman and Dr. Cindy Calkin received a \$650,000 grant from Global Affairs Canada to pursue their work in Neuroanatomical and Neurofunctional Assessment in Acquired Brain Injury. Specifically, they are studying the high-profile incidents of potential acquired brain injuries experienced by diplomats who worked in Cuba. The study involves a large multidisciplinary team of clinician-researchers with diverse expertise, including neurology, occupational therapy, physiotherapy, audiology, vestibular, orthoptics, imaging, psychiatry and toxicology. Research is ongoing, findings have not yet been released.

Dalhousie University, Nova Scotia Health Authority and the IWK Health Centre are research partners.

This research is an extension of the BRC's Traumatic Brain Injury Research Partnership (TBIRP) research model. The model promotes a multifaceted and multidisciplinary approach to traumatic brain injury research, from prevention to post-injury. The Brain Repair Centre developed this research model in 2017, with financial assistance from the Department of Labour and Advanced Education and supported by the Department of Health and Wellness. It is anticipated that this research will extend with new funding.



## KNOWLEDGE TRANSLATION GRANTS

Every year the Brain Repair Centre awards peer-reviewed Knowledge Translation (KT) Grants to help its researchers launch their studies and to increase their opportunities to secure additional funding. Since the BRC began distributing this funding five years ago, the KT Grants have helped researchers leverage an additional \$10 million in funding (see Appendix A).

In March 2019, the BRC awarded \$134,000\* in Knowledge Translation Grants to five projects.

INVESTIGATOR	PROJECT TITLE	AMOUNT AWARDED
John Frampton	Development of a Flexible Biomaterial Fiber for Nerve Guidance	\$ 30,000
James Fawcett	Development of a Mouse Model for Pre-Clinical Anxiolytic Drug Testing	\$ 28,000
Ying Zhang	A Novel Treatment for ALS	\$ 30,000
George Robertson	A Novel Lipid Nanoparticle Formulation to Reduce Ischemic/Reperfusion Brain Injury	\$ 29,000
Raymond Klein	The Attention Network Test Database: A Structured Resource Accessible to Clinicians, Researchers and Knowledge Users	\$ 15,000

*\*BRC carried over KT funding from the previous fiscal year, which allowed it to exceed the annual \$90,000 budget and award more projects in 2019.*

**SINCE THE BRC BEGAN DISTRIBUTING THIS FUNDING FIVE YEARS AGO, THE KT GRANTS HAVE HELPED RESEARCHERS LEVERAGE AN ADDITIONAL \$10 MILLION IN FUNDING (SEE APPENDIX A)**

## **RICK HANSEN VISITS BRC**

When visiting Dalhousie, Rick Hansen, the British Columbian-born activist and founder of the Rick Hansen Foundation, toured the Brain Repair Centre. Dr. Victor Rafuse hosted the tour which showcased some of the work being done at the centre to advance spinal cord injury, clinically and through basic science. Rick is a passionate supporter of people with disabilities in Canada and is best known as the “Man in Motion” for his epic 26-month, 34-country, 40,000-kilometre wheelchair trip around the world to prove the potential of people with disabilities and raise funds for spinal cord injury research.

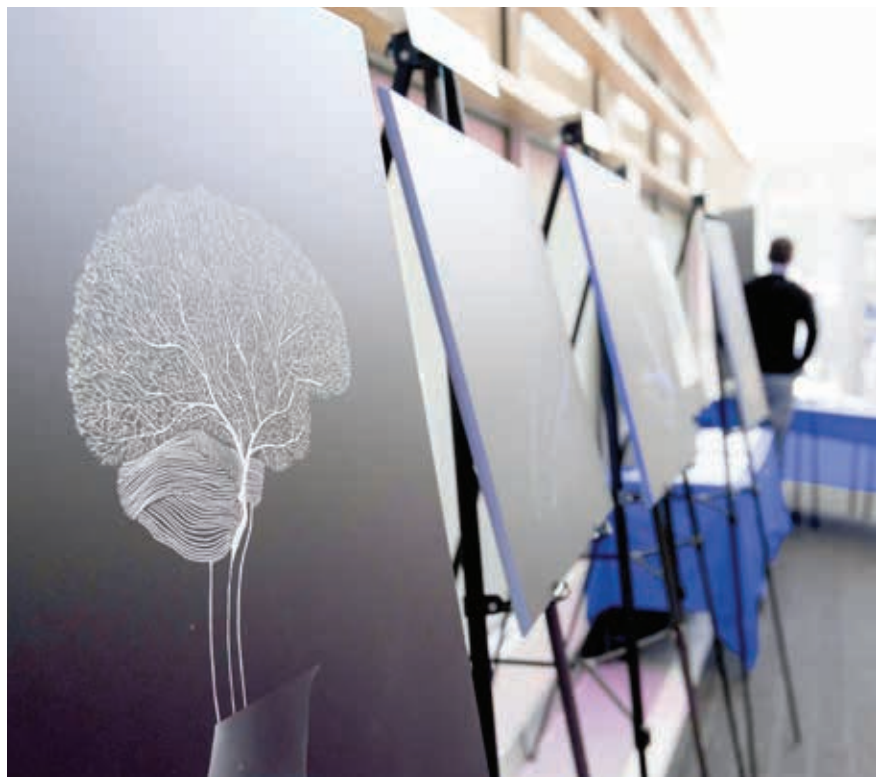
## **BRAIN AWARENESS WEEK**

During Brain Awareness Week in March, the BRC continued to work with local societies and students to increase awareness of brain-related research. The campaign included organizing a Neuroscience as Art competition, which raised funds for charity. During the week, BRC also hosted a grade 6 student field trip to the Brain Fair. Equipped with passports to fill out, the curious students visited a circuit of hands-on neuroscience exhibits hosted by students from various BRC member labs. The day was rounded out with a tour of the BRC labs.

## **JOURNAL CLUBS**

The Brain Repair Centre Journal Club Program continues to thrive. These neuroscience-focused journal clubs in the Dalhousie University, NSHA, IWK Health Centre community encourage the cross-pollination of ideas, new partnerships, and more opportunities to advance research and the application of new knowledge. BRC awards \$1,000 to each of the five Journal Clubs annually to support invited speakers, luncheon events, and regular meetings. The Journal Clubs are Atlantic Mobility Action Project, Interdisciplinary Science, Undergraduate Neuroscience, Vision Science, and a new Acquired Brain Injuries club, which is run by REHAB.

This year the Journal Clubs experienced increased participation and there was more collaboration among the clubs which promotes knowledge translation and collaborative research. Journal Club meeting dates and annual reports can be found on BRC's website, [brainrepair.ca](http://brainrepair.ca).





## AMBITIOUS VISION FOR THE FUTURE

Thanks to novel approaches and new experimental techniques, BRC researchers and their colleagues around the world are making rapid and enormous strides toward understanding the brain and spinal cord and how these complex systems change with illness and age. This knowledge will lead to new technologies and treatments with the potential to save and transform lives.

Armed with a new strategic plan, the Brain Repair Centre aims to play a leadership role in achieving this ambitious vision. To do this, it must continue to be highly competitive in obtaining research

dollars—not only from national and provincial granting agencies but also through philanthropic organizations and individuals that share their vision.

We must also ensure that our research environment continues to attract world-leading scientists and trainees to Halifax, where they can build sustainable and collaborative research programs and launch successful entrepreneurial ventures. Finally, we must engage more fully with the communities we seek to serve, so that we may share in their mutual successes.

## APPENDIX A: LEVERAGED FUNDING FROM KNOWLEDGE TRANSLATION GRANTS

The following is a list of subsequent funding BRC members have leveraged to date, after receiving a KT Grant.

### A. FRIEDMAN

Innovacorp Life Sciences Pre-Investment Program (LSPI)	\$	50,000	
Innovacorp (MedTech Accelerate Program)	\$	50,000	
BioNova Technical Assistance Program (TAP)	\$	15,000	over 3 years
Therapix (Corporate)	\$	100,000	
ACOA Productivity and Business Skills Initiative (PBS)	\$	50,000	
CIHR (Project Grant)	\$	955,625	over 5 years
ACOA Productivity and Business Skills Initiative (PBS)	\$	50,000	
Mitacs grant for one PhD student	\$	80,000	
CIHR (Project Grant) Co-Investigator	\$	600,000	over 3 years
Global Affairs Canada (MRI Study) Principal Investigator	\$	54,600	
NSERC (Discovery Grant) Principal Investigator	\$	25,000	
NSHA (Research Fund) Co-Applicant	\$	25,000	

### S. BOE

Innovacorp Early Stage Commercialization Fund	\$	50,000	
Heart & Stroke Foundation Team Grant	\$	268,830	over 3 years (co-applicant with G Eskes)
Nova Scotia Health Authority (Category 3 – Trainee) Principal Investigator	\$	5,000	
Innovacorp	\$	50,000	

### D. CLARKE

ACOA	\$	370,000	
ACOA (Conquer Mobile)	\$	200,000	
NSHA (Periop Dragons Den)	\$	45,000	
CIHR (Project Grant)	\$	955,625	over 5 years (co-applicant with A Friedman)
Optimization & Validation of a Novel Emergency Department Point-of-Care MRI	\$	1,960,160	

## G. ESKES

Innovacorp Early Stage Commercialization Fund	\$	50,000	
Heart & Stroke Foundation Grant-in-Aid	\$	187,544	over 3 years

## G. ROBERTSON

Parkinson Canada Research Project	\$	45,000	
Heart & Stroke Foundation Team Grant	\$	268,830	over 3 years
MS Society of Canada Biomedical Grant	\$	300,000	over 3 years
Dalhousie Psychiatry Research Fund	\$	20,000	
Heart & Stroke Foundation Canada Grant-in-Aid Principal Applicant	\$	263,995	over 3 years
Parkinson Society Canada (Pilot Project) Principal Applicant	\$	50,000	

## S. DARVESH

DMRF (Dalhousie Medical Research Foundation) Irene MacDonald Sobey Chair	\$	350,000	over 5 years
Innovacorp (I-3 tech Start-up Comp)	\$	25,000	
CIHR (Project Grant)	\$	1,457,325	over 5 years
DMRF Adopt a Researcher	\$	250,000	over 2 years
CIHR (Project Grant) Co-Applicant	\$	466,652	over 4 years
DMRF (Equipment Funding) Principal Applicant	\$	154,000	
CFI (John R. Evans Leaders Fund) Co-Applicant	\$	704,744	

## S. CHRISTIE

CIHR (Personalized Health Catalyst Grant) Co-Investigator	\$	200,000	over 2 years
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**TOTAL:** **\$10,702,930**

## APPENDIX B: FINANCIALS 2018-19

### EXPENSES

PAYROLL	Payroll + Benefits	\$ 134,044
	GAC time (Pis)	\$ 20,000
OPERATIONAL EXPENSES	Training & Office Supplies	\$ 1,637
	Printing	\$ 950
	Equipment Purchase	\$ 1,419
	Meetings - general	\$ 1,795
	- Neuro Leaders meeting	\$ 11,337
	- GAC project	\$ 2,265
	Journal Clubs	\$ 3,847
	Utilities	\$ 1,756
CONFERENCES	Travel & Registration	\$ 9,194
	Cluster Conferences	\$ 12,936
	Promotional	\$ 12,466
	BAW	\$ 3,759
EXTERNAL CONTRACTORS	Communications, Design, Research	\$ 13,744
	Grant Review Committee	\$ 1,215
STUDENT AWARDS	Travel Prizes	\$ 4,997
SPONSORSHIP	Societies	\$ 5,572
	Promo items	\$ 847
GRANTS	KT Grants	\$ 132,000
<b>TOTAL EXPENDITURE:</b>		<b>\$ 375,780</b>

### INCOME

QEII	\$ 525
DAL	\$ 50,000
LAE	\$ 250,000
NSHA	\$ 29,750
CARRY OVER FROM 2018	\$ 49,091
<b>TOTAL INCOME:</b>	<b>\$ 379,366</b>



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[brainrepair.ca](http://brainrepair.ca)