





MESSAGE FROM OUR DIRECTOR

Our biggest and most welcome change this year has been the engagement and interaction with people in person rather than through the internet. This welcoming change meant that we could, and did, provide more support for research, education, and communication. While this increase in support required more administration, trainee engagement and increased our costs, the feedback we received was extremely positive. Thank you for all those who were involved. extremely positive. Thank you for all those who were involved.

Over the past year we developed a new strategic plan for 2023-2026 based on the successful outcomes from our previous strategic plan. Consequently, the focus of the BRC continues to be research, education, and innovation. BRC members are important to Nova Scotians and our healthcare system because we research diseases and disorders of the nervous system. In addition, we educate our students/trainees by providing career mentorship opportunities, seminars, and journal clubs. Finally, we support innovation by providing innovation grants, entrepreneurship classes and one-on-one mentorship when the opportunities arise. Perhaps the importance of the BRC was best captured by Dr. Anderson (Dean, FoM) at the recent BRC Research day event when he said: *“research has a direct and immediate impact on patient care and influences public policy and clinical practice to protect and improve population health in the Maritimes and beyond.”*

Our relationships with the provincial and federal government continues to strengthen. For example, Senator Kutcher, co-founder, and strong ally of the BRC, met with us several times over the past year and participated as a panelist on the BRC Research Day where he strongly argued that more funding and support for research is needed to compete internationally. This additional funding would help build existing research programs, retain trainees in Canada and increase our contribution to health research discoveries world-wide. Similar sentiments were echoed by MP Andy Fillmore (Parliamentary Secretary to the Minister of Industry, Science, and Innovation), another panelist at the Research Day. MP Lena Diab, a very strong ally of the BRC, participated on a lab tour and sought our input for the Standing Committee on Research.

Provincially, Minister Wong (NS Advanced Education) met and engaged the BRC Executive, and later met with

our trainees. At the latter meeting the students expressed their interests in medical neuroscience research and their desire to stay in Nova Scotia upon completion of their studies. In addition, the students talked about the challenges and stresses that result from studying/working in an underfunded system where salaries cannot keep up with the cost of living in Halifax and the high tuitions charged by Dalhousie. It is therefore imperative that these difficulties are reduced because our students' research is a vital part of the health care system. The BRC recognizes these challenges and is actively working with the Dean's office, university, and government to address these issues.

The BRC is also working with the NS Dept. of Health and Wellness on a Traumatic Brain Injury Research Partnership to develop a road map and business plan to fund research on brain and spinal cord injury. Concurrently, the BRC is also in discussion with the NS Dept. of Seniors and Long-term care to address a new BRC initiative called the Aging Brain. This initiative is important as Nova Scotia has the second highest number of seniors per capita in Canada and neurological issues make up a large percentage of difficulties facing this group. Both initiatives are being designed to help improve health outcomes for those affected. Finally, we continue to engage with local societies involved in specific neuroscience diseases and disorders. With the waning of the pandemic, the BRC hosted the local societies for the first time in several years. One of the main topics at the meeting was to organize a fund raising event involving all the societies.

As mentioned above, Research Day, our signature event, occurred in person after a hiatus of several years due to the pandemic. It was a decided success. It began with the Dean of Medicine welcoming us, followed by a panel discussion on research funding and the impact it has on our future. The balance of the day saw poster presentations and talks by BRC trainees and Investigators. As expected from these types of events, several collaborations are in discussion. Another series of events happened in conjunction with Brain Awareness Week. We saw a higher degree of participation of our researchers and students. In addition, we had the highest attendance

ever from the public attending this year's Brain Fair. We are pleased to see that the interest in the BRC continues to grow and flourish. This year two more researchers studying mental health and addiction joined the BRC Executive: Dr. Phil Tibbo (Dept. of Psychiatry, Research Head) and Dr. Tamara Franklin (Psychology).

As usual, securing and increasing our budget is a major concern that we continue to address. While the provincial government has been supportive, and provided funds over the last 15 years, additional funds are needed if we wish to grow. Current programs would be enhanced with additional funds and de novo projects could begin. An additional staff member with expertise in communications and fund raising would allow us to better tell our research stories to Nova Scotians and to show how our work will improve health outcomes now, and into the future. To date, our dedicated staff have been excellent in planning, organizing, and implementing our varied events. However, their time is mostly defined.

I started my letter by thanking those who helped increase the success of the BRC over the past year. This help has resulted in a marked increase in participation from our students, researchers, and the public. Last year was the most successful since I began my tenure as BRC Director. Based on last year's achievements, I believe we have a solid foundation and are poised to flourish over the coming years.

Sincerely,

Dr. Victor Rafuse
Director, Brain Repair Centre



EXECUTIVE SUMMARY

This past year saw in person encounters resume and a resurgence in engagement from members and others. There was a palpable excitement particularly during our successful Brain Awareness Week activities.

The year began with the development of a new strategic plan which will carry us to 2026. Key points included broadening our focussed research initiatives to include mental health, increase sustainable funding sources for programs and staff, and continue to engage on policy such as the Aging Brain, Traumatic Brain Injury Research Partnership (TBIRP), and the Canadian Brain Research Strategy (CBRS). Our additional main thrust is to support our students in their sojourn as a student and careers post university.

The BRC continues to lead on policy work. This was evident in the panel discussion during Research Day re funding research and the future. The TBIRP has been further defined in order for the department of Health and Wellness to understand the significance of its scope and application. We have begun consultations with the NS Department of Seniors and Long-term Care and hope to identify a program of work to support our aging population. We are driving these important policy concepts and any others as they arise towards the facilitation of neuroscience research. This is an important quest. Research is key in finding therapeutics, devices, protocols, etc. and ultimately the patient benefits along with the health care system.

Student engagement has increased. For the first time they had the opportunity to meet Minister Wong and express their concerns re the meagre student stipends. They have been involved in most BRC activities in various capacities. They volunteer for various activities, lab tours, committees, brain fair, etc. Our students are our future and we strive to connect them to people, programs and activities for their benefit.

Work continues apace with a small staff mostly part-time. However, it appears that we have been successful in increasing engagement and participation of members and others. It bodes well for the future. Nova Scotia will benefit from our world class research, our educational programs and our innovations.

Moving forward, the BRC plans to facilitate the expansion of neuroscience-based research, encourage, and create programs in support of BRC members, and develop linkages with stakeholders to leverage our reach, and grow our funding.



Highlights from the past year include:

BRAIN AWARENESS WEEK

The 2023 Brain Awareness Week was a busy one, with in-person events making a comeback. BRC events included: Brain Fair; Public Talk; Neuroscience SLAM; Neuroscience as Art Competition & Auction; and Halifax Brain Bee; Brain-Computer Interface Neuro-Hackathon and the annual Crossroads Interdisciplinary Health Research Conference.

BRAIN FAIR

After three years, we were delighted to hold an in-person Brain Fair 2023 during March Break. It was the best Brain Fair ever! The event was attended by over 150 members of the public (kids and parents/carers). 16 labs, staffed by graduate and undergraduate students, shared their research via interactive games, demos, dissections etc. Feedback from the attendees was positive, attendees of all ages learned something new and the trainees enjoyed the opportunity to translate their research to a lay audience.

PUBLIC TALK

Four of our members – Drs Tara Perrot, Jen Khoury, Phil Tibbo and Gail Eskes – presented on the topic of “Lifelong Brain Health”. Each speaker focussed on a stage of life and offered insights to brain health, stress etc from early development to old age. The audience included members of the public, who were engaged and asked many questions, leading to a dynamic discussion.



2023 SLAM YOUR NEUROSCIENCE

Following on last year’s inaugural SLAM, we had a small cohort of undergraduate trainees taking part in the 2023 SLAM Your Neuroscience.

The objective of the Slam was for students to present their research in an engaging, clear and concise way in order to communicate science research to a wider audience. Undergraduate students, enrolled in neuroscience-focused independent research projects, were invited to participate. They were scored on presentation, timing and clarity of communication to the audience. The panel of judges included graduate students and post-doctoral fellows.

Winners of the 2023 SLAM were:

- Ainsley Monchesko (Supervisor: Dr. Leslie Philmore)
- Diana Adamo (Supervisor: Dr. Shelley Adamo)
- Sierra Gaudreau (Supervisor: Dr. Heather Neyedli)



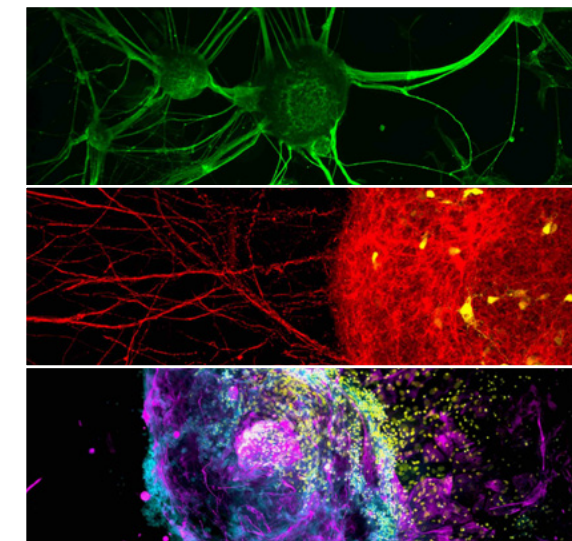
BRAIN BEE

Returning to an in-person format, the 2023 Brain Bee was held in March and was attended by 17 students representing schools in Halifax and beyond. After two tough rounds of questions, the students enjoyed lab tours and chats with graduate students. The winner was Shabad Kaur from Halifax West High School, who placed 2nd in last year’s Halifax Brain Bee. The 2023 runners-up were Reema Abdelghani from Charles P Allen; and Anna MacDonald from Lockview High who also competed in the 2022 Halifax Brain Bee. Shabad will travel to McMaster in May for the National competition, along with another Nova Scotian representative, from the Antigonish Brain Bee, which launched this year.



NEUROSCIENCE AS ART

The BRC continued to work with local societies and students to increase awareness of brain-related research. The annual Neuroscience as Art competition, which raises funds for charity, was run during Brain Awareness Week 2023. The winning pictures from the 2023 event were sold via online auction, raising over \$300 for the IWK Eye Clinic.





RESEARCH DAY

The day began with a panel discussion which was a first for the BRC. It was intended to shed light on the current and future situation for research funding and provide an introduction to some of the personalities and organizations involved. Funding research is a complex and fundamental requirement in the ecosystem in support of the research enterprise. A point echoed over the day, was that while we strive for healthy brains, there is still much to learn and to discover. This is especially true as we reflect on the current situation here and around the world (Alzheimer's and ALS to name only a few diseases) with unmet remedies and/or limited treatment options.

BRC Director Vic Rafuse reminded us all that “scientific research and clinical research are inextricably linked”. Ultimately improved health and patient care requires new diagnostics, devices, therapies and protocols that can only be achieved through research endeavors.

Further, Senator Dr. Stan Kutcher stressed the importance of neuroscience research and said: “No one discovery could take on and understand this complex organ (brain) by itself.” Additionally, he said, “If you haven't discovered it, you are not going to commercialize it”, stressing the importance of discovery research.

We heard from MP Andy Fillmore who also is the Parliamentary Secretary (PS) to the Minister of Innovation, Science and Industry. Andy mentioned that government is increasing its investment in research. He said that there has been a \$4B annual investment to the research community. Further CIHR is committing \$20M over 5 years to research dementia and brain health.

Dr. Mira Puri- Manager of Science Initiatives Azrieli Foundation spoke about the background to the set-up of the Foundation by David Azrieli- a survivor of the Holocaust and former architect, developer and builder. David Azrieli's values of sharing with society, coupled with his gain of freedom led to his drive to create a philanthropic foundation.

The link to neuroscience research was due to the family connection to Fragile X syndrome. The Azrieli Foundation has a unique approach to funding referenced as creative collisions which can lead to diverse perspectives and ultimately opportunities.

Dr. Jennie Young- Executive Director of the Canadian Brain Research Strategy (CBRS) was another panelist. She indicated that there is a challenge to advance neuroscience research across the country. Healthy brains are fundamental but when this is not the case contribute to the leading cause of disability. In 2019, 1 in 5 had a brain disorder. There currently are limited treatment options and with research there is hope. A strategy will offer coordination and collaboration to harness and direct brain research in Canada.

Marli MacNeil, currently the Chief Operating Officer at Research Nova Scotia (RNS), has been involved with the BRC for the past 21 years. RNS was formed 4 years ago and is supported by an Act with Regulations. Marli talked about RNS being a support organization while coordinating Nova Scotia research in 4 priority areas: Bioeconomy; Climate Change; Quality of Life; and Healthy People and Health Care Systems. RNS is involved in the research continuum between early discovery and commercialization. Finally, Marli mentioned that RNS has provided more than \$350K in Scotia Scholar awards to BRC members over the last 4 years.

Federal, provincial, and philanthropic funders are key sources for BRC researchers. An overarching, coherent strategy – CBRS, will benefit the future of neuroscience research in Canada.

The panel discussion was followed by 10 presentations on current research. Many trainees and a few principal investigators led this session. The lunch hour saw 23 posters presented and much discussion was observed during this time. In addition, posters were evaluated, and prizes awarded for the top posters. The engagement and discussions observed are a testament to the high level of interest generated throughout the day.



TBI CLUSTER 2022 EVENT

This year's annual Traumatic Brain Injury Retreat, drew more than 40 participants, including national and international leaders in brain injury research, who came together.

The TBI cluster is led by Dr. Alon Friedman and the retreat featured recent work from his trainees, plus researchers from collaborating institutions. Attendees at the retreat included Dr. Daniela Kaufer, (Associate Dean and Professor at the Department of Integrative Biology, University of California, Berkeley), Dr. David Clarke (Division of Neurosurgery, Dalhousie University), Dr. Benjamin Whatley (Division of Neurology, Dalhousie University), as well as many other early and mid-career investigators.



More about the event including highlights, agenda and presenters can be found at www.brainrepair.ca/research-cluster-tbi

AMAP MEETING

The annual AMAP meeting was held at White Point Resort, with 39 attendees, including special guests, Dr Tim Bredy and Claudette & Eric Sturk. Dr Bredy is a professor at Queensland Brain Institute (The University of Queensland); Claudette is a retired teacher, and Eric, a retired lawyer, husband and care-giver. Claudette's story brought a very human perspective to the meeting as a person who was diagnosed and is currently living with ALS. Eric spoke about his role as Claudette's caregiver as well as his support to her. The following day, Dr Bredy opened the presentations with a seminar on "RNA in Neuroscience". This was followed by 18 presentations given by trainees and Principal Investigators. Sessions were chaired by trainees, giving them an opportunity to expand their skills.

Read about Team Sturk-Tek at www.brainrepair.ca/news/team-sturk-trek



PSYCHIATRY RESEARCH DAY 2022

The 2022 Psychiatry Research day was held at the Atlantica Hotel, Halifax. The keynote speaker was Dr. Paul Kurdyak, a psychiatrist in Toronto, at the Centre for Addiction and Mental Health (CAMH). In addition to oral presentations, there were poster presentations from a wide range of trainees, including some BRC members. Dr Phil Tibbo organised the event and is working with the BRC to set up a Mental Health cluster, which will see even more collaborations among our members.



COMMUNICATIONS

Effort, time and resources have been invested in our communications program. It began with a revamp to our web-site in 2021, followed by communications advice and guidance tendered through services. Then we received a boost in the BRC budget in 2021/22 which afforded the opportunity to hire a communications assistant. Now we are beginning to see the benefits of these “investments”. Our programs are well subscribed and our web stats are encouraging. How we manage in the future will be a challenge without a budget increase. We regularly provide news, profiles, projects, videos, event calendar and more. As mentioned, a measure of our success has been our web stats, which show a marked increase in traffic over the past year. As follows:



NEW BRC WEBSITE - SUCCESS INDICATORS

BRAINREPAIR.CA



FROM WHERE?

- 67%** Canada
(all 10 provinces, 70% Nova Scotia)
- 17%** United States
- 7%** Germany

12K VISITS

(+49% yr/yr)
Average Monthly views
~1000, Feb 2023 = 1716

9.7K UNIQUE VISITORS

(+61% yr/yr)
Average Monthly visitors
~750, Feb 2023 = 1172

23K PAGE VIEWS

(+31% yr/yr)
Average ~1750 Feb 2023 = 3369

23% Hit the Home Page

7% News

3.5% Research Day

8% Calendar

BRC/BEN GURION UNIVERSITY (ISRAEL) COLLABORATION

Initial reports suggest that the international collaborations are working well, and initial findings are positive, but it's too early for any substantial results. We anticipate progress reports in the next fiscal.

DMRF STUDENT TRAINEESHIP AWARD

We anticipate reports from the trainees in Sept 2023.

CANADIAN BRAIN RESEARCH STRATEGY (CBRS) UPDATE

The Canadian Brain Research Strategy continues to lobby for more funding to fuel neuroscience research in Canada. This funding will harness and unite the researchers, institutions, and funders from across Canada. Already 30 neuroscience and mental health entities and 25 public and private science funders and industry leaders have joined this coalition.

The annual healthcare costs of brain conditions in Canada are more than \$61 billion and growing. Understanding the brain - in health, development, disease, and resilience - will be critical to Canada's success and well-being in the

21st century. We are at a critical inflection point in making progress to understand the human brain. *"Canada must seize this opportunity to reap the societal and economic benefits and needs to be able to keep up with, connect to, and draw on the efforts of other national and pan-national brain initiatives."* (CBRS statement by Dr. Jennie Young)

The strategy will be collaborative, transdisciplinary and open. Already the CBRS has a vision and strategic plan. Indeed, while its Executive Director, Dr. Jennie Young, was in Halifax, participating on its panel discussion during BRC Research Day, further steps were taken. Dr. Young was able to engage, MP Andy Fillmore in his capacity as Parliamentary Secretary to the Minister of Innovation, Science and Industry. Through this introduction, she was able to meet the Prime Minister, who was also at Dalhousie University at that time. These connections are invaluable to raise awareness of the CBRS.

The BRC will continue to participate on this important initiative and shape the future of brain research.

SOCIETIES

Our work with the following provincial societies: ALS NS and NB, Alzheimer's, Brain Injury Association of NS, Epilepsy Association, and Multiple Sclerosis, was broadened this past year to include the Canadian Mental Health Association. This is particularly important with our new focus/cluster on mental health, led by psychiatrist, Dr. Phil Tibbo, a new member of the BRC Executive.

The BRC links to these local neurological charities to better understand the patient/client perspective, facilitate communications and educational opportunities and seek ways to promote each other's initiatives. In addition, we are working on an initiative proposed by ALS NB and NS to jointly develop a proposal for fundraising while promoting the important work of all these organizations. We are relatively small with many associations competing for scarce resources so perhaps we will come up with a novel way to shine a light on our mutual work while also generating funds.



BRC SUPPORTS OUR STUDENT RESEARCHERS

BRAIN WAVES GROUP

BRC trainees (graduate students) met with Minister Wong on June 21st 2022, to discuss their concerns with graduate student life. The most prominent topics revolved around the low graduate student stipends, high cost of living, and the impact of these two factors on trainee mental health. The Minister heard that effectively graduate students are living on the poverty level with the current stipends. These stipends are for graduate students involved in lab work and research. The graduate students asked for an increase to offset the increasing costs of living. They also presented an anonymous survey of the graduate students in the department of Medical Neuroscience which detailed the comments and struggles of individual students, as well as a recommendation letter summarizing their concerns.

Another concern addressed the tuition costs at Dalhousie. Many other Canadian universities have a reduced or no tuition costs. To be fair to our students, stipends must be increased, and tuition costs lowered. This will improve their quality of life, and increase Dalhousie's competitiveness in research at an international level.

At the end of November, students learned via the news, that Minister Wong offered a one-time payment of \$550 to post-secondary students receiving Nova Scotia Student Assistance. Unfortunately, most BRC trainees were ineligible for this assistance.



Monique Guilderson was the guest speaker at the January Brain Waves event. She is an osteopath with a background as a Medical Illustrator. The group enjoyed hearing about her career path as much as her artwork. Monique donated a large number of original prints to the Brain Repair Centre.



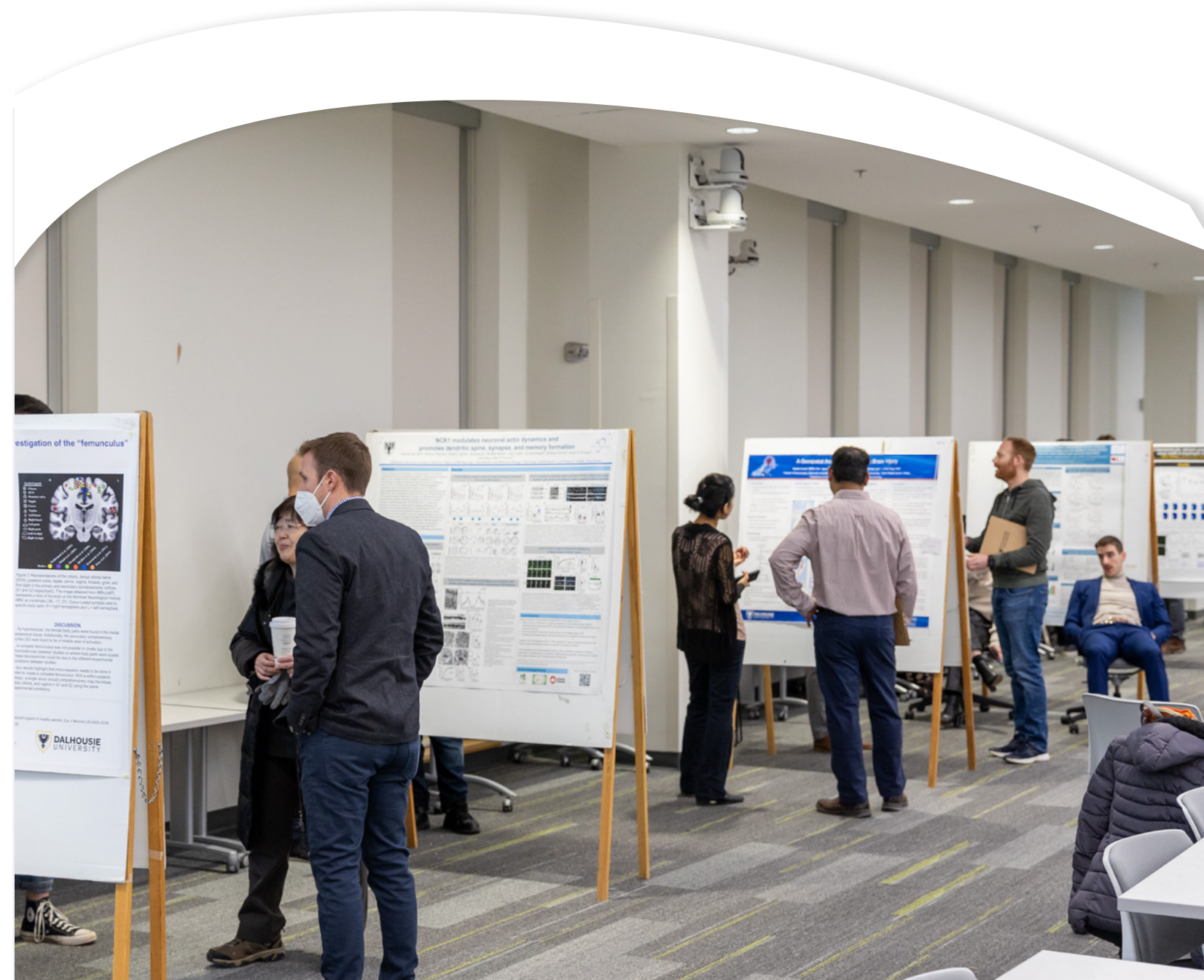
Speaking of donations, **Peter Covert**, a TBI survivor, and one of the advocates for the Traumatic Brain Injury (TBI) group, gifted a number of books to the Brain Repair Centre. We offered these books as prizes for trainee events and it seems there are many people who still like to read a real book as they have all been gratefully accepted.



Tuan Bui visited Dalhousie in February 2023. We invited him to share his story with the Brain Waves group, because he is an alumni. Dr. Bui is now a researcher at University of Ottawa's Brain and Mind Institute. He provided our trainees with insights on an academic career path.

JOURNAL CLUBS

In 2022/23, we had 7 active Journal Clubs: Atlantic Mobility Action Project (AMAP); Interdisciplinary Science (IS); Undergraduate Neuroscience (UNS); Vision Science (VS); Acquired Brain Injuries (ABI); Insect Research Group (IRG); and the Glia Club. Meetings range from bi-weekly to monthly, are organised by trainees and attended by researchers of all levels across the Dalhousie University/NSHealth/IWK Health Centre community. They and are a great opportunity for Knowledge Translation and encourage the cross-pollination of ideas, new partnerships, and more opportunities to advance research and the application of new knowledge.



INNOVATION GRANTS

Previously known as Knowledge Translation (KT) Grants

In March 2023, the BRC awarded \$90,000 in KT Grants to three projects. The awards went to:

INVESTIGATOR	PROJECT TITLE	AMOUNT AWARDED
Adam Johnston	<i>Development of a pre-clinical model to interrogate the function of Twist2-positive muscle stem cells in Duchenne muscular dystrophy</i>	\$30,000
George Robertson	<i>Alginate hydrogel formulation of Ru265 for the treatment of spinal cord injury</i>	\$30,000
Tamara Franklin	<i>Understanding the link between adolescent stress and postpartum depression</i>	\$30,000

As in past years, we chose adjudicators from the world of neuroscience, but at arm’s length to the BRC. This year we were pleased to have the input of Dr. Stuart Trenholm - McGill University; Dr. Joel Ross - University of PEI; and Dr. Michael Kawaja - Queens University.

PROGRESS/UPDATES ON KT GRANTS AWARDED IN 2022

Dr. Vic Rafuse & Dr Laura Dumas

Title: Unraveling Schwann cell diversity in healthy and injured peripheral nerve

The intent of this project is to understand how different Schwann cell subtypes contribute to peripheral nerve repair. It will involve simultaneous observations of multiple Schwann cells after injury, employing a multicolor approach, called MAGIC Markers. Each cell is labeled

with a different color code using a transgenic strategy. This color code relies on the combinatorial colors expressed in both nuclei and cytoplasm and needs to be imaged on an appropriate confocal microscope. Ethics approval for animal experiments has just been granted and the transgenic mice are currently being imported. Therefore, an extension for an additional year has been granted and results should be in the next year.

Dr. Sean Christie

Title: Understanding Spinal Cord Blood Flow After Traumatic Injury

Unfortunately, an essential member of our interdisciplinary surgery team has had to step back due to health circumstances. It is now apparent that we will have to find a qualified replacement, comfortable participating in large

mammal models. We are currently interviewing potential candidates. Meanwhile we are continuing with other work related to technique optimization and related research in the background. This time is also used to confirm some related CNS blood flow findings in small animal models which will be strengthening our KT grant experiment. We hope to be able to provide a complete report at the end of the coming year.

REPORTS ON 2021 GRANTS THAT WERE COMPLETED/EXTENDED

Dr. George S. Robertson

Title: Development of an intranasal nanoparticle formulation of IRX4204 designed to promote functional recovery in multiple sclerosis by stimulating CNS repair mechanisms

The intent was to develop a therapeutic formulation to use in the treatment of Multiple sclerosis (MS). MS is a crippling neurodegenerative disorder caused by self-reactive immune cells that destroy myelin in the central nervous system (CNS). Myelin insulates axons that conduct electrical signals which allow nerve cells to communicate with each other. Demyelination in the spinal cord impairs the conduction of electrical signals necessary for walking resulting in mobility deficits. Remyelination is therefore considered essential for motor recovery in MS. This has fueled an intense search for drugs that stimulate remyelination. Activation of the retinoid X receptor (RXR) promotes remyelination by suppressing inflammation and increasing the production of myelin-producing oligodendrocytes in the CNS. IRX4204 is a drug that preferentially activates the RXR. Oral administration of IRX4204 reduces the development of inflammation and

paralysis in mice subjected to experimental autoimmune encephalomyelitis (EAE), a commonly used animal model of MS. Funding from the BRC-KT program has enabled us to show that IRX4204 also improves the recovery of motor function (walking) in EAE mice. However, IRX4204 suffers from adverse side effects mediated by actions on cells outside of the CNS. To overcome this problem, we have been funded to develop an intranasal drug delivery system for IRX4204. This drug delivery system is based on the encapsulation of IRX4204 in nanoparticles that readily enter the CNS after intranasal administration. To identify the optimal nanoparticle formulation of IRX4204 for animal testing, we have developed cell-based models of inflammation in the CNS. These cell-based models have enabled us to identify a promising nanoparticle formulation (NPF) of IRX4204 for testing in EAE mice. We have now tested this NPF of IRX4204 in EAE mice. Unfortunately, intranasal delivery did not produce IRX4204 concentrations sufficient to activate the RXR, reduce inflammation in the CNS and improve gait performance in EAE mice. We are therefore developing alternative NPFs designed to improve IRX4204 delivery to the CNS of EAE mice.

Dr. Angelo Iulianella

Title: A genetic method to scale neural organoid tissue size for disease modeling and cell replacement therapies.

Significant progress has happened on Dr. Angelo Iulianella’s BRC-KT grant. It involved exploring spinal organoid dynamics and scaling. Along with an honours undergraduate student, the work proposed to optimize tissue culture conditions to generate reproducible spinal

organoids. We anticipate that by the end of April, we will have a better idea if our method at deriving spinal organoids from mouse embryonic stem cells is improved over existing methods. Along with a collaborator, they have generated mutant mouse embryonic stem cell lines that inactivate a critical signaling pathway that may regulate size control in organoid cultures. It is anticipated that this work will go on for another year before it is determined if the approach is successful.

RESEARCH, DISSEMINATION & COMMERCIALIZATION (RDC) GRANTS

The BRC RDC program supports events and meetings that contribute to the dissemination, exchange and commercialization of research and innovation aimed at improving brain and neurological health outcomes for Nova Scotians and Canadians. The main objective of this funding opportunity is to enhance the international reputation of the Halifax neuroscience community by supporting local events and meetings that will attract international, national and local participants and, as a result, highlight intellectual property (IP) for potential investment opportunities in Nova Scotia.

The 2022/23 RDC grant has been awarded to Drs Turgay Akay and Ying Zhang for an International Symposium on Motor Control. This event will take place in September 2023 in conjunction with the AMAP annual retreat.

OTHER GRANTS AWARDED TO BRC MEMBERS

Congratulations to the following BRC members who were awarded grants in 2022/23. Continuing validation of the neuroscience research being done at the BRC!

CIHR: Martin Alda; Gail Eskes; David Clarke; Alon Friedman; Jamie Kramer; Jeremy Brown; Vic Rafuse; John Frampton; Phil Tibbo

NSERC Discovery: Ian Weaver; Adam Johnston; Ying Zhang, Steven Beyea; Melina Agosto

MITACS: Tara Perrot; Heather Neyedli; Noreen Kamal

NSHRF: Gail Eskes; David Clarke; Phil Tibbo

The Arthritis Society: Jason MacDougall

MS Society of Canada: George Robertson

Research NS: Philip Tibbo

AGING BRAIN

Lastly, we have begun work on the concept of the Aging Brain. This will replace the neurodegeneration cluster. We have hired a consultant to draft a concept piece which will be delivered over the summer of 2023. We will also work with the NS Department of Seniors and Long-term Care to flesh out a policy piece which should help guide our research. Given that NS has the second fastest aging population and therefore neurological diseases and disorders arise. We need new treatments, protocols and therapies. Neuroscience research is never more important than now. We will also explore working with Department of Health and Wellness. Research Nova Scotia, CIHR and NSERC will likely be the main sources for grants for this research.

We have seen and continue to note programs and research facilitating a healthy brain and lifestyle; however, it is important to also address the underlying causes which perturb a healthy brain.

APPENDIX A: FINANCIALS 2022-23

EXPENSES		ACTUAL
Payroll	Payroll + Benefits	\$ 172,525
Operational Expenses	Training & Office Supplies	\$ 901
	Printing	\$ 1,008
	Equipment Purchase	\$ 1,982
	Meetings - general	\$ 7,398
	Journal Clubs	\$ 5,467
	Utilities	\$ 1,466
Conferences	Travel & Registration	\$ 5,248
	Cluster Conferences	\$ 21,968
	Promotional	\$ 0
	BAW	\$ 1,149
External Contractors	Communications, Design, Research	\$ 5,802
	Grant Review Committee	\$ 2,250
Student Awards	Travel Prizes	\$ 0
	Competitions	\$ 2,150
Sponsorship	Societies	\$ 6,000
	Promo items	\$ 1,062
Grants	Innovation Grants	\$ 90,000
	Research, Dissemination & Commercialisation Grant	\$ 10,000
	DMRF Graduate Studentships	\$ 100,000
	DAL BGU Collaborations	\$ 140,000
Total Expenditure		\$ 576,376
INCOME		
	QEII Foundation (Donations)	\$ 308
	DAL (FoM)	\$ 85,000
	LAE	\$ 250,000
	DMRF (Graduate Traineeships)	\$ 100,000
	DMRF DAL/BGU Collab	\$ 140,000
TOTAL INCOME		\$ 575,308

APPENDIX B: 5-YEAR SUMMARY KNOWLEDGE TRANSLATION GRANTS


The following is a list of awardees of KT grants since 2018/19, and subsequent funding which they received after their KT award.

YEAR	# OF AWARDS	NAME OF RECIPIENTS
2022	2	Dr. Sean Christie; Dr. Laura Dumas & Dr Vic Rafuse
2021	3	Dr. Aaron Newman; Dr. Jamie Kramer; Dr. George Robertson
2020	3	Dr. Gail Eskes; Dr. Steven Beyea; Dr. Angelo Iulianella
2019	5	Dr John Frampton; Dr James Fawcett; Dr Ying Zhang; Dr George Robertson; Dr Raymond Klein
2018	2	Dr Sean Christie; Dr Gail Eskes

RESEARCHER/PI	FUNDING SOURCE	AMOUNT (\$)	DURATION
George Robertson	Multiple Sclerosis Society of Canada Catalyst Grant	50,000	2 yrs
	Congressionally Directed Medical Research Program (CDMRP)	205,000	2 yrs
Gail Eskes	NSHRF	99,825	3 yrs
	CIHR	398,700	6 yrs
Steven Beyea	Research NS COVID Research Coalition Grants	76,648	1 yr
	Synaptive Medical Industry Matching Funding	76,648	1 yr
	CIHR Project Grant	610,000	3 yrs
	Synaptive Medical Industry Matching Funding	87,500	1 yr
	NSERC Discovery	279,165	3 yrs
	Inovait	887,400	1 yr
Angelo Iulianella	NSERC Discovery Grant	160,000	5 yrs
	Plum Foundation	40,000	1 yr
John Frampton	DMRF – Molly appeal	250,000	1 yr
	CFI	2,000,000	1 yr
	CIHR	952,246	5 yrs
	CIHR (Student Stipend)	140,000	4 yrs
	Lab2Market	15,000	1 yr
Ray Klein	NSERC Discovery	235,000	5 yrs
	ESCF	47,200	1 yr
Sean Christie	NSHRF	25,000	1 yr
	Dalhousie University	14,000	2.5 yrs
	Dalhousie University	60,000	5 yrs
	CIHR	742,000	1 yr
	Dalhousie University	14,000	4 yrs
	AbbVie Corp	951,685	2 yrs
TOTAL		8,417,017	




BRAIN-IMMUNE RECIPROCAL DYSFUNCTION IN HIV-ASSOCIATED NEUROCOGNITIVE DISORDERS




David O. McNamara

Brain Repair Centre

Life Sciences Research Institute
1348 Summer Street, Halifax NS B3H 4R2

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