



Queen's
UNIVERSITY

centre for
neuroscience
studies
AT QUEEN'S UNIVERSITY

Annual Report 2021-2022

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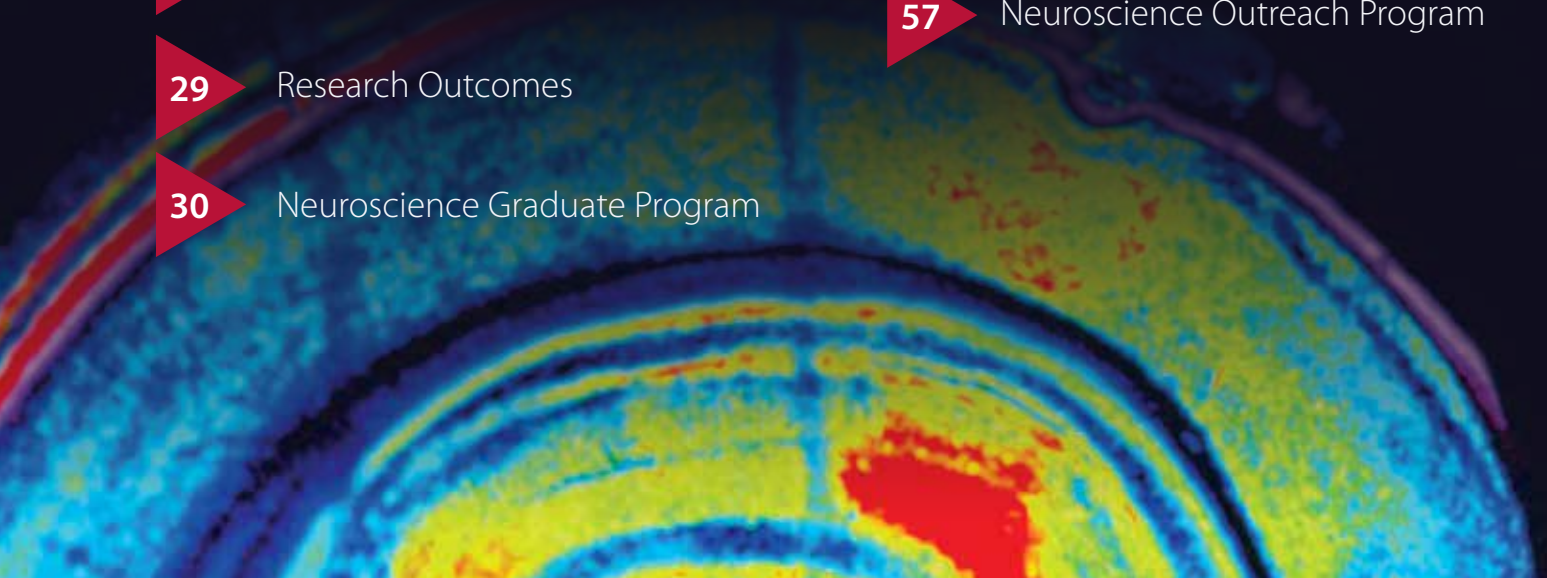
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MESSAGE FROM THE Director

Dear Colleagues, Students, Staff and Friends!

When the pandemic broke out in 2020, little did I know that two years later I would still be addressing its impact. Despite many stops and starts, neuroscience research at Queen's has carried on and not only been productive but in many instances, has excelled beyond expectations. The research productivity was outstanding with our members holding more than \$18M in funding. As you will see further on in the report, more than \$1.5M of this funding has come in the form of industry relationships with our faculty. Many of our faculty and students are now taking advantage of industry partnerships through Mitacs. As government tri-council funding has become more and more difficult to obtain, we can see the increasing importance of industry relationships with basic science research. We are also able to boast 1902 published refereed journal articles and over 73,865 research citations. These numbers represent an enormous amount of research productivity and an increase of more than 300 publications over last year's report.

"Our outstanding faculty, students, postdoctoral fellows, and staff work together tirelessly to improve the quality of lives affected by neurological and psychiatric disease."

Although we did once again face restrictions on the usage of the MR facility over the past year, we were still operational. New studies are now launching and the facility booking schedule is very full.

Our past pilot time competition recipients are beginning to launch these studies and we look forward to launching the next competition this fall. Our graduate program as always continues to grow in leaps and bounds with many students now returned to working on campus. In September 2021 we saw the start of our academic year with 41 MSc and 50 PhD candidates. Through funding from the provincial government, the CNS has undertaken the creation of six microcredential courses including a multi-institutional Capstone course which will provide hands-on experience utilizing various research techniques and infrastructure. We look forward to some of these courses launching this fall and will be accessible at the local, national and international levels.

I would like to take this opportunity to thank everyone who contributes so much to the CNS environment. It is a pleasure watching our institution succeed at neuroscience research and training. Our outstanding faculty, students, postdoctoral fellows, and staff work together tirelessly to improve the quality of lives affected by neurological and psychiatric disease. The Centre for Neuroscience Studies plays a vital role in facilitating these successes.

Roumen Milev, MD PhD FRCPsych FRCPC DFCCA DFAPA
Professor of Psychiatry and Psychology
Vice President, Medical and Academic Affairs, Providence Care,
Kingston, On
Director, Centre for Neuroscience Studies, Queen's University, Kingston,
On
Executive Chair, Canadian Network for Mood and Anxiety Treatments
(CANMAT)



VISION

The CNS is internationally recognized for ground-breaking inter-disciplinary neuroscience research and teaching, through:

- ▶ Defining and being known for significant achievements in 2-3 research themes where we hold significant expertise and where we continually strive for excellence
- ▶ Being a hub in a pan-Canadian neuroscience network linking medical, industry and other partners in collaborative research and teaching
- ▶ Proactively engaging faculty across Queen's and in other institutions in collaborative, multi-disciplinary initiatives
- ▶ Developing and delivering innovative graduate education program

By 2023, WE WILL:

- ▶ Recruit new faculty with primary appointments in neuroscience
- ▶ Ensure financial sustainability with mechanisms in place. Benefactors have been secured and endowments are in place
 - ▶ Have a plan in place to establish a physical research centre, where trainees and faculty can meet
 - ▶ Have outstanding public outreach and strong community relations

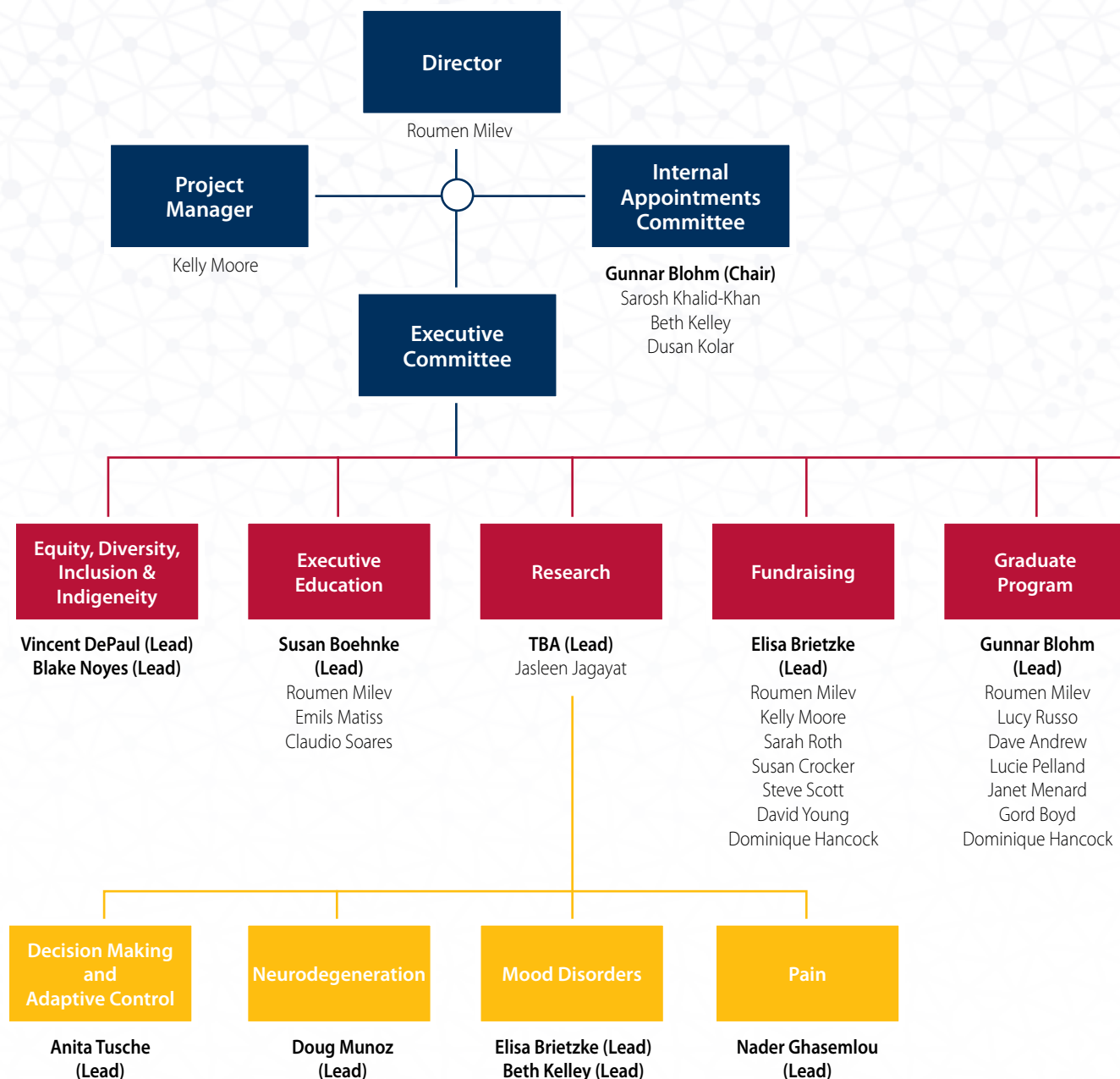
MISSION

Lay the foundations for a sustainable program of innovative, inter-disciplinary neuroscience research and teaching, and so assure the future success of the Centre through:

- ▶ Creating a well governed organization with 2- 3 major research themes
- ▶ Raising the profile and accomplishments of the Centre and neuroscience activities at Queen's, and enhancing the dialogue and collaboration around neuroscience
- ▶ Establishing a plan for a sustainable financial model for the Centre's operations
 - ▶ Effectively modifying our graduate program

PRIORITIES

- ▶ Research
- ▶ Education
- ▶ Profile and Awareness
- ▶ Governance
- ▶ Financial Sustainability





Industry Relations

MR Facility

Jason Gallivan (Lead)

Don Brien
Kelly Moore
Gavin Winston
Tim Salomons
AJ Conway
Alexander Bambokian
Fouad Elgindy

Finance

Roumen Milev (Lead)

Dale Best
Kelly Moore
AJ Conway
Lucy Russo
Najat Khalifa
Dusan Kolar
Gunnar Blohm
Nicole Hunniford
Kelly Hart

Student Leadership

Emils Matiss (Lead)

Tasha Jawa
Scott Squires
Landon Montag
Isabelle Mastantuono
Aron Philipp-Muller
Colleen Fleury
Marion Lazaj
Parsa Balalaie

Seminars

Michele Morningstar (Lead)

Sydney Dore
Aleksandar Biorac
Marion Lazaj
Jasleen Jagayat

Safety

Kelly Moore (Lead)

Kim Moore (NHP)
AJ Conway (HDH)
Mike Lewis (Abramsky)
Don Brien (MRI)
Kim Suffron (Botterell 2)
Alex McLaren

MEET OUR FACULTY



**Nazanin Alavi
Tabari**

ASSISTANT PROFESSOR
PSYCHIATRY

RESEARCH INTEREST:

Dr. Alavi Tabari's research focuses on the effectiveness of online Cognitive Behavioural Therapy (CBT) in treatment of mood and anxiety disorders. Currently they are designing an online psychotherapy clinic to address different mental health disorders.



Ryan Alkins

ASSISTANT PROFESSOR
SURGERY

RESEARCH INTEREST:

Dr. Alkin's is interested in ultrasound for therapeutic interventions, particularly in combination with ultrasound contrast agents (microbubbles), with a focus on malignant brain tumors and stroke recovery.



Shideh Ameri

ASSISTANT PROFESSOR
ELECTRICAL AND COMPUTER
ENGINEERING

RESEARCH INTEREST:

Dr. Ameri's research interests are in developing electronic devices, sensors and circuits using novel nano materials for realization of highly reliable

sensors and systems with applications in biosensing, mobile health care, internet of things and human-machine interfaces.



David Andrew

PROFESSOR
BIOMEDICAL AND
MOLECULAR SCIENCES

RESEARCH INTEREST:

Dr. Andrew studies how our higher brain is susceptible to global ischemia while our brainstem is dramatically resistant.



**Ramana
Appireddy**

ASSISTANT PROFESSOR
MEDICINE

RESEARCH INTEREST:

Dr. Appireddy's research focuses on examining the role of social determinants of health in affecting access to stroke care and stroke outcomes.



Martha Bailey

PROFESSOR
FACULTY OF LAW, CENTRE
FOR NEUROSCIENCE STUDIES

RESEARCH INTEREST:

Dr. Bailey's research interest are in Neuroscience and the Law.



**William
Bendena**

PROFESSOR
BIOLOGY

RESEARCH INTEREST:

Dr. Bendena uses *Caenorhabditis elegans* as a genetic model to dissect neuropeptide signaling pathways.



Brian Bennett

PROFESSOR
BIOMEDICAL AND
MOLECULAR SCIENCES

RESEARCH INTEREST:

Dr. Bennett is using an oxidative stress-based mouse model of late onset Alzheimer's disease and a mouse model of Down Syndrome to assess the efficacy of therapeutic agents for improving memory and for slowing, preventing, or reversing pathological changes associated with these conditions.



Andrew Bickle

ASSISTANT PROFESSOR
PSYCHIATRY

RESEARCH INTEREST:

Dr. Bickle's research interests are in Transcranial Direct Current Stimulation applied to risk factors for offending behaviour, such as abnormal impulsivity and substance misuse. Otherwise interested in research conducted within criminal justice system settings.



Etienne Bisson

ADJUNCT ASSISTANT
PROFESSOR
ANESTHESIOLOGY AND
PERIOPERATIVE MEDICINE,
SCHOOL OF REHABILITATION
THERAPY

RESEARCH INTEREST:

Dr. Bisson's works on Translational pain research to improve clinical care of adults with chronic pain with special interests in the relationships between pain, fatigue, mobility, physical activity and falls. His main research currently focuses on understanding how falls, their underlying physical and psychological factors and prevention interplay in the development, treatment and management of chronic pain.



Michael Blennerhassett

PROFESSOR
MEDICINE

RESEARCH INTEREST:

Dr. Blennerhassett examines factors influencing development and plasticity of postnatal enteric neurons, and promotion of survival in the face of challenge. This increases the understanding of inflammatory damage and can find ways to reduce the impact of disease on intestinal motility.



Gunnar Blohm

PROFESSOR
DEPARTMENTS OF
BIOMEDICAL & MOLECULAR
SCIENCES, PSYCHOLOGY,
MATHEMATICS & STATISTICS,
AND SCHOOL OF
COMPUTING

RESEARCH INTEREST:

Dr. Blohm's lab uses a combination of mathematical modeling, computer simulations and human experimentation to understand brain function through studying sensory-motor processes. Our goal is to uncover general neurocomputational principles underlying healthy and impaired brains.



Susan Boehnke

ASSISTANT PROFESSOR
BIOMEDICAL AND MOLECULAR SCIENCES

RESEARCH INTEREST:

Dr. Boehnke studies the development and validation of a non-human primate model of Alzheimer's Disease. In addition, she is understanding the neural representation of visual and auditory signals, and how they elicit behavioural responses such as eye movements and changes in pupil size.



Lysa Boisse Lomax

ASSISTANT PROFESSOR
MEDICINE

RESEARCH INTEREST:

Dr. Boisse Lomax's research interests include epilepsy genetics and epilepsy

syndromes (such as North Sea Myoclonus Epilepsy), cardiac arrhythmia in epilepsy, and virtual clinical teaching tools for residents.



Amanda Bongers

ASSISTANT PROFESSOR
CHEMISTRY

RESEARCH INTEREST:

Dr. Bongers leads the Queen's Chemistry Education Research Group, studying learning in chemistry and science. They are using eye-tracking and EEG to explore how the brain encodes and manipulates scientific models.



Christopher Bowie

PROFESSOR (PHD, CPSYCH)
PSYCHOLOGY, PSYCHIATRY

RESEARCH INTEREST:

Dr. Bowie studies the causes and correlates of functional disability and recovery in mood disorders and schizophrenia. His lab designs experimental studies to better understand mechanisms involved and develop treatments to modify these mechanisms and improve outcomes.

MEET OUR FACULTY



Gordon Boyd

ASSOCIATE PROFESSOR (MD,
PHD, FRCPC)
MEDICINE (NEUROLOGY) AND
CRITICAL CARE MEDICINE

RESEARCH INTEREST:

Dr. Boyd's research group is interested in the neurological complications of critical illness, cardiac disease, and kidney disease.



Elisa Brietzke

PROFESSOR (MD, PHD)
PSYCHIATRY

RESEARCH INTEREST:

Dr. Brietzke is interested in the investigation of neurobiology of mood disorders, with a special emphasis on immune-inflammatory abnormalities, metabolic changes and domains of psychopathology, such as anhedonia and cognitive decline. She is also focused on the application of these findings to the development of innovative treatments for bipolar disorder and depression.



Inka Brockhausen

ASSOCIATE PROFESSOR
BIOMEDICAL AND
MOLECULAR SCIENCES

RESEARCH INTEREST:

Dr. Brockhausen studies glycosylation

of proteins and lipids, aggregation mechanisms of synuclein in Parkinson's and bacterial polysaccharide synthesis.



Monica Castellano

PROFESSOR, CHAIR OF
COGNITIVE NEUROSCIENCE
PSYCHOLOGY

RESEARCH INTEREST:

Dr. Castellano's primary research interests are in the visual attention and visual memory and how they function in our everyday lives. Her lab is currently studying these processes as they relate to real-world scenes. Across various studies they investigate how people perceive, explore, search through and remember information from complex, natural stimuli.



Meredith Chivers

ASSOCIATE PROFESSOR,
PHD, CPSYCH, QUEEN'S
NATIONAL SCHOLAR,
CANADIAN INSTITUTES OF
HEALTH RESEARCH NEW
INVESTIGATOR
PSYCHOLOGY, CENTRE FOR
NEUROSCIENCE

RESEARCH INTEREST:

Dr. Chiver's primary research focuses on sexual attractions, sexual response, and sexual functioning, and the influence of gender and sex on these aspects of our sexualities. Her current work focuses on the neurocognitive factors associated

with sexual response in women with and without sexual difficulties.



Elvina Chu

ASSOCIATE PROFESSOR
PSYCHIATRY, CROSS
APPOINTMENT WITH
NEUROLOGY

RESEARCH INTEREST:

Dr. Chu's research interests are allied to clinical neuropsychiatry and investigating psychiatric presentations and behavioural alterations that manifest in neurological conditions such as brain injury, stroke, epilepsy, Parkinson's and Huntington's disease.



DJ Cook

ASSOCIATE PROFESSOR
SURGERY

RESEARCH INTEREST:

Dr. Cook studies transitional stroke research, pre-clinical validation of stroke therapy, neuroplasticity and stroke recovery.



Nicholas Cothros

ASSISTANT PROFESSOR
MEDICINE

RESEARCH INTEREST:

Dr. Cothros studies behavioural and cognitive neuroscience related to human motor control.



Wendy Craig

PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

Dr. Craig's current research projects include: understanding the biological, psychological, and social correlates of cyberbullying, peer victimization and peer defending; investigating the role of shame in bullying and the associated mental health consequences; and evaluating knowledge mobilization of bullying research and its impact.



Susan Crocker

ASSISTANT PROFESSOR
PATHOLOGY AND
MOLECULAR MEDICINE

RESEARCH INTEREST:

Dr. Crocker's research interests are in cytogenomics and biomarker discovery for neurodegenerative disease.



Claire Davies

ASSISTANT PROFESSOR
MECHANICAL AND
MATERIALS ENGINEERING

RESEARCH INTEREST:

Dr. Davies primary research goal focuses on increasing independence of people with disabilities. Understanding the perceptual and physical responses of all the senses, primarily vision, haptics and sound, has provided insight into how design of devices should be undertaken to create human-machine interfaces that are easily navigated and accepted.



Fernanda De Felice

ADJUNCT ASSOCIATE
PROFESSOR
BIOMEDICAL AND
MOLECULAR SCIENCES

RESEARCH INTEREST:

Dr. Felice's research focuses on investigating the molecular mechanisms linking Alzheimer's disease (AD) to diabetes and to an unhealthy lifestyle. Clinical/epidemiological studies have linked AD to diabetes, with each disease increasing the risk of developing the other.



Vincent DePaul

ASSISTANT PROFESSOR
SCHOOL OF REHABILITATION
THERAPY

RESEARCH INTEREST:

Dr. DePaul's research focuses on the development, testing, and translation of interventions for the recovery of walking in individuals with stroke, other neurological conditions, and in older adult populations. This work specifically explores how individuals optimally learn and re-learn gait and balance-related skills; and how therapeutic strategies such as instruction, feedback, guidance, and supervised and unsupervised practice impact motor learning.



Nandini Deshpande

ASSOCIATE PROFESSOR
SCHOOL OF REHABILITATION
THERAPY

RESEARCH INTEREST:

Dr. Deshpande's research focuses on vestibular and somatosensory functions; sensory integration process; impact of aging and diabetes on sensory functions and possible consequent modulation in sensory integration process and their impact on postural control during functional activities; other factors responsible for sustaining mobility in older adults with specific emphasis on fear of falling.



Andrew Drury

ASSISTANT PROFESSOR
PSYCHIATRY

RESEARCH INTEREST:

Dr. Drury's research is focused on intellectual and developmental disabilities.

MEET OUR FACULTY



Anne Duffy

PROFESSOR (MD, FRCPC)
PSYCHIATRY

RESEARCH INTEREST:

Dr. Duffy studies the onset of mental illness in young people at variable risk including university students and children of mentally ill parents.



Ali Etemad

ASSISTANT PROFESSOR
ELECTRICAL AND COMPUTER
ENGINEERING

RESEARCH INTEREST:

Dr. Etemad's main area of research is machine learning and deep learning focused on human-centered applications with wearables, smart devices, and smart environments.



Alastair Ferguson

PROFESSOR
BIOMEDICAL AND
MOLECULAR SCIENCES

RESEARCH INTEREST:

Dr. Ferguson operates an interdisciplinary Neuroscience research group studying the role of the central nervous system in autonomic processing, with a specific emphasis on understanding changes in brain function associated with hypertension and obesity.



Randy Flanagan

PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

Dr. Flanagan's aim for his Cognition and Action Lab is to understand the cognitive and computational processes underlying movement control and learning. Visit the web site to learn how they use virtual reality and other tools to study eye-hand coordination, object manipulation, sensory-motor adaptation, and links between action and perception.



Luis Flores

ASSISTANT PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

The central theme of Dr. Flores' research is how close relationships and interpersonal functioning confer protection or risk in the development and clinical course of depression. His research program includes examining the role of altered neural response to social-affective interactions in depression.



Rafael Freire

ASSOCIATE PROFESSOR
(MD, PHD)
PSYCHIATRY

RESEARCH INTEREST:

Dr. Freire's research focuses on anxiety disorders and obsessive-

compulsive disorder (OCD). He studies neurobiology, biomarkers, neurostimulation and pharmacological interventions for anxiety disorders and OCD. He is also interested in studying provocative tests for anxiety disorders, such as exposure to carbon dioxide, pictures and virtual reality.



Jason Gallivan

ASSISTANT PROFESSOR
PSYCHOLOGY & BIOMEDICAL
AND MOLECULAR SCIENCES

RESEARCH INTEREST:

Dr. Gallivan's lab is interested in the cognitive and neural mechanisms that underpin processes related to action, learning and memory, decision-making, and perception.



Nader Ghasemlou

ASSISTANT PROFESSOR
ANESTHESIOLOGY;
BIOMEDICAL & MOLECULAR
SCIENCES

RESEARCH INTEREST:

Dr. Nader's Pain Chronobiology and Neuroimmunology Laboratory seeks to understand how the interaction between circadian, inflammatory and sensory systems modulate pathophysiology. His translational research program takes advantage of functional/behavioural, cellular, and molecular approaches in both humans and animal models to identify new therapeutic targets for the treatment of nervous system injury and disease.



Ian Gilron

PROFESSOR AND DIRECTOR
OF CLINICAL PAIN RESEARCH
(MD, MSC, FRCP)
ANESTHESIOLOGY &
PERIOPERATIVE MEDICINE,
AND BIOMEDICAL &
MOLECULAR SCIENCES
(CROSS-APPOINTED)

RESEARCH INTEREST:

Dr. Gilron's work is on translational research on mechanisms and treatment of acute and chronic pain, clinical trials of pain management interventions, systematic review and meta-analysis of pain research studies.



Fabiano Gomes

ASSISTANT PROFESSOR
PSYCHIATRY

RESEARCH INTEREST:

Dr. Gomes is interested in studying effective ways to implement evidence-based treatments as well as developing innovative therapeutic approaches to patients with mood disorders.



Dianne Groll

ASSOCIATE PROFESSOR
PSYCHIATRY AND
PSYCHOLOGY (CROSS
APPOINTMENT)

RESEARCH INTEREST:

Dr. Groll's research interests are in Operational Stress Injuries (OSI) in military and first responders, evaluation of OSI treatment programs and therapies.



Kate Harkness

PROFESSOR (PHD, CPSYCH)
PSYCHOLOGY, PSYCHIATRY
(CROSS APPOINTMENT)

RESEARCH INTEREST:

The goal of Dr. Harkness' research is to understand the role of stress and early trauma in the etiology and ongoing pathology of major depression in adolescence and adulthood. Her current work focuses on neurohormonal, social cognitive, and motivational/reward factors that increase the sensitivity to, and generation of, stress in major depression.



Tariq Hassan

ASSISTANT PROFESSOR
PSYCHIATRY

RESEARCH INTEREST:

Dr. Tariq Hassan has an interest in neurostimulation and its effects on impulsivity and addiction in the forensic population.



Michael Hendry

ASSISTANT PROFESSOR
SURGERY

RESEARCH INTEREST:

Dr. Hendry's lab examines the regulatory pathways responsible for peripheral nerve regeneration with the aim to improve outcomes following nerve injury.



Felicia Iftene

ASSOCIATE PROFESSOR
PSYCHIATRY (CROSS
APPOINTMENT PSYCHOLOGY)

RESEARCH INTEREST:

Dr. Iftene's research interests are focused on schizophrenia and cognitive behavioural therapy for psychosis, quality of life of clients with severe mental disorders.



Al Jin

ASSOCIATE PROFESSOR
MEDICINE

RESEARCH INTEREST:

Dr. Jin's research laboratory focuses on the use of experimental models of stroke to understand the roles of spreading depolarization and neuroinflammation in post-stroke cerebral injury. He is also interested in the use of robotic technology to assess cognitive and motor behaviour impairment in stroke and other neurological disorders.



Jessica Jones

PROFESSOR
PSYCHIATRY, PSYCHOLOGY

RESEARCH INTEREST:

Dr. Jones's research interest is in the area of neurodevelopmental disorders.

MEET OUR FACULTY



Michael Kawaja

PROFESSOR
BIOMEDICAL AND
MOLECULAR SCIENCES

RESEARCH INTEREST:

The nervous system is viewed as having plasticity, that inherent ability to adapt both structurally and functionally to injury or disease. In Dr. Kawaja's laboratory, they are taking two approaches to address this issue. First, they are studying the role that growth factors and their receptors play during the generation of new axonal processes. Second, they are studying how grafting different cell types into the injured spinal cord of adult rats can enhance both axonal growth and functional recovery.



Beth Kelley

ASSOCIATE PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

Dr. Kelley is interested in the social, cognitive, language, and mental health aspects of development in children and adolescents with neurodevelopmental disorders.



Sarosh Khalid-Khan

ASSOCIATE PROFESSOR
PSYCHIATRY

RESEARCH INTEREST:

Dr. Khalid-Khan's areas of interest are: prevention of childhood anxiety disorders, psychotherapeutic interventions in adolescent mood and anxiety disorders, enhancing primary care capacity to treat childhood psychiatric disorders and transcultural psychiatry.



Najat Khalifa

ASSOCIATE PROFESSOR (MD,
MRCPsych (UK)
FORENSIC PSYCHIATRY,
CORRECTIONAL SERVICE OF
CANADA

RESEARCH INTEREST:

Dr. Khalifa studies the use of non-invasive brain stimulation techniques to modulate impulsivity, empathy and decision making; mental disorder and offending behaviour; and risk factors for terrorism.



John Kirby

PROFESSOR EMERITUS
FACULTY OF EDUCATION,
CROSS-APPOINTED TO THE
CENTRE FOR NEUROSCIENCE
STUDIES

RESEARCH INTEREST:

Dr. Kirby's research concerns the cognitive processes involved in reading, including phonological

awareness, naming speed, orthographic knowledge, morphological awareness, and comprehension processes. He investigates the application of these processes to the diagnosis of reading disabilities and the design of instruction.



Dusan Kolar

ASSOCIATE PROFESSOR
PSYCHIATRY

RESEARCH INTEREST:

Dr. Kolar's research includes the treatment resistant mood disorders, anxiety disorders, ECT and rTMS, comorbidity in psychiatry, multimodal treatment, combination of medication and psychotherapy.



Valerie Kuhlmeier

PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

Dr. Kuhlmeier studies cognition from a developmental and evolutionary perspective. She examines the origins of our cognitive capacities in a comparative manner, studying infants, young children, non-human primates, and canines.



Benjamin Kwan

ASSISTANT PROFESSOR,
ASSISTANT PROGRAM
DIRECTOR DIAGNOSTIC
RADIOLOGY RESIDENCY,
CBME LEAD, FACULTY
RESEARCH DIRECTOR
RADIOLOGY

RESEARCH INTEREST:

Dr. Kwan examines the usage of high-resolution vessel wall imaging in giant cell arteritis and competency based medical education in diagnostic radiology.



Ron Levy

ASSISTANT PROFESSOR
SURGERY

RESEARCH INTEREST:

Dr. Levy's lab studies electrophysiology and novel electrical neuromodulation paradigms in patients and animal models of Parkinson's disease.



Alan Lomax

ASSOCIATE PROFESSOR
BIOMEDICAL AND
MOLECULAR SCIENCES

RESEARCH INTEREST:

Dr. Lomax's lab studies enteric neurons and nociceptive neurons to understand how neuroplasticity can lead to pain and altered function during disease. Their research on neurogenesis focuses on factors that suppress the generation of new neurons in the adult enteric nervous system.



Neil Magoski

PROFESSOR
BIOMEDICAL AND
MOLECULAR SCIENCES

RESEARCH INTEREST:

Dr. Magoski's research looks at the regulation of ion channel function and long-term changes to excitability in neuroendocrine cells that initiate reproduction. Electrophysiology, live-cell imaging, as well as cell and molecular biology are used to study both native and cloned acetylcholine receptors, non-selective cation channels, calcium channels, and gap junctions.



Alina Marin

ASSOCIATE PROFESSOR
PSYCHIATRY

RESEARCH INTEREST:

Dr. Marin's research initiatives focus on the role of the context in shaping voluntary and automatic emotion regulation, as well as the mechanisms underlying these processes.



Gerome Manson

ASSISTANT PROFESSOR
DEPARTMENT: SCHOOL OF
KINESIOLOGY AND HEALTH
STUDIES

RESEARCH INTEREST:

The objective of Dr. Manson's research program is to understand the influence of sensory information on the planning and control of goal-

directed actions. In particular, he is interested in the underlying processes that differentiate a movement made toward a target located on the body (i.e. a somatosensory target) versus a movement to an external object. He uses a combination of sensory manipulations, motion tracking, and neuroimaging to answer these questions.



Chris McGlory

ASSISTANT PROFESSOR
KINESIOLOGY AND HEALTH

STUDIES

RESEARCH INTEREST:

The aim of Dr. McGlory's research program is to understand the cellular and molecular mechanisms underpinning the adaptive response of skeletal muscle to nutrition, exercise training, and immobilization. He specializes in the use of stable isotopic tracers to track skeletal muscle protein turnover combined with a variety of molecular biology techniques for measurement of enzyme activity, protein expression, and post-translational modification.

MEET OUR FACULTY



Janet Menard

ASSOCIATE PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

Dr. Menard's research is concerned with the neural circuits responsible for mediating fear as a useful adaptation, as well as with how altered brain function might promote maladaptive levels of fear. They use animal models of anxiety (rats being our animal of choice) to study how fear is regulated in the brain (e.g., what brain structures, neurochemicals and receptor types are involved?). They also explore how these neural systems and the defensive behaviors they regulate are modified by prior experience (e.g., maternal neglect in early life and/or chronic stress in adulthood).



Roumen Milev

PROFESSOR
PSYCHIATRY (CROSS
APPOINTMENT PSYCHOLOGY)

RESEARCH INTEREST:

Dr. Milev's research interests include biomarkers for treatment response in depression, psychopharmacological and neurostimulation treatments for mood disorders, sleep architecture, and overcoming stigma because of mental illness.



Michele Morningstar

ASSISTANT PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

Dr. Morningstar's research focuses on the development of emotional communication and social cognition from childhood to adulthood. She uses a variety of methods, including speech analysis and functional neuroimaging, to determine how these basic emotional skills contribute to social functioning and psychological well-being across development.



Doug Munoz

PROFESSOR
BIOMEDICAL AND
MOLECULAR SCIENCES

RESEARCH INTEREST:

Dr. Munoz's research is devoted to: understanding the neural circuitry controlling visual fixation and the generation of saccadic eye movements, and using the knowledge of this circuitry to probe a variety of neurological and psychiatric disorders such as Attention Deficit Hyperactivity Disorder, Parkinson's Disease, Alzheimer's, Tourette's Syndrome and ALS.



Jose Alberto Neder Serafini

PROFESSOR
MEDICINE

RESEARCH INTEREST:

Dr. Neder is a clinician scientist interested in the multiple mechanisms that interact to produce breathlessness (dyspnea) and exercise intolerance in patients with cardiorespiratory diseases. Knowledge created by his research has been successfully translated into patients' care, ranging from early diagnosis to target therapy and innovative rehabilitation approaches.



Mary Olmstead

PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

Dr. Olmstead's research is directed towards understanding the neural and psychological interface between motivation and cognition, or how rewarding stimuli influence learning. Her working hypothesis is that goal-directed behaviours and cognitive processes, as part of a dynamic interactive system, reciprocally modulate each other.



Martin Paré

PROFESSOR

RESEARCH INTEREST:

Dr. Paré's research interest is in neural basis of cognitive and active vision.



Lucie Pelland

ASSOCIATE PROFESSOR
SCHOOL OF REHABILITATION
THERAPY

RESEARCH INTEREST:

Dr. Pelland's research aims to understand the development of sensory-motor control in both typical child development and in selected paediatric clinical populations. Visually-guided reaching is used as a model to explore the dynamic influences of neural maturation, cognition and limb mechanics on the development and learning of sensory-motor control.



Jordan Poppenk

ASSISTANT PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

Dr. Poppenk researches the consequences of bringing memories to life. To this end, his studies frequently incorporate monitoring of human brain activity with fMRI. Using computational methods, he tracks neural evidence of memory reactivation within participants' brains, which he relates to other processes such as memory formation, forgetting, planning for the future, and perception.



Caroline Pukall

PROFESSOR, CLINICAL
PSYCHOLOGIST
PSYCHOLOGY, SCHOOL
OF REHABILITATION
THERAPY, DEPARTMENT
OF BIOMEDICAL AND
MOLECULAR SCIENCES

RESEARCH INTEREST:

Dr. Pukall's work is in human sexuality, sexual dysfunction, vulvodynia, sexual arousal, psychophysics, psychophysiology, brain/spinal cord and blood flow imaging.



James Purzner

ASSISTANT PROFESSOR
SURGERY

RESEARCH INTEREST:

Dr. Purzner's research interests are in neurosurgery and brain tumours.



Taras Reshetuka

ASSISTANT PROFESSOR
PSYCHIATRY

RESEARCH INTEREST:

Dr. Reshetuka's research interests are in the fields of suicide, emergency psychiatry and PTSD.



James Reynolds

PROFESSOR
BIOMEDICAL AND
MOLECULAR SCIENCES

RESEARCH INTEREST:

Eye movement control is a powerful tool for assessing various aspects of brain function, including sensory-motor

control and cognitive flexibility. Dr. Reynold's studies have demonstrated that behavioural deficits in eye movement control can be measured in children with FASD. Future studies will be aimed at developing eye movement tasks and other novel tools that can be used to assess brain function in children with FASD and other neurodevelopmental disorders.



Benjamin Ritsma

ASSISTANT PROFESSOR
PHYSICAL MEDICINE AND
REHABILITATION

RESEARCH INTEREST:

Dr. Ritsma's areas of interest are stroke, virtual health care, ALS, peripheral nerve injury and electrodiagnostic medicine.



Francois Rivest

ASSOCIATE PROFESSOR
SCHOOL OF COMPUTING

RESEARCH INTEREST:

Dr. Rivest studies artificial intelligence, machine learning, reinforcement learning, animal learning, interval timing, dopamine, and computational neuroscience.

MEET OUR FACULTY



Mel Robertson

PROFESSOR
BIOLOGY

RESEARCH INTEREST:

Dr. Robertson's laboratory investigates how neuronal mechanisms underlying behaviour of model organisms (locusts and *Drosophila*) are affected by abiotic environmental factors (e.g. temperature or oxygen availability). His lab's current focus is on reversible neural shutdown in response to anoxia via a process of spreading depolarization of neurons and glia.



Jacob Rullo

MD, PHD
OPHTHALMOLOGY,
BIOMEDICAL AND
MOLECULAR SCIENCES

RESEARCH INTEREST:

Dr. Rullo's research interest is Understanding the relationship between small locally accumulating biomolecules and ocular disease. Optic neuropathy and neuroprotection.



Mark Sabbagh

PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

Dr. Sabbagh's lab is focused on understanding the social, cognitive, and, neurobiological bases of cognitive and conceptual development. In particular they are interested in the mechanisms that promote developmental change in preschool-aged children's social cognitive and language development.



Tim Salomons

PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

Dr. Salomons is interested in how thoughts and feelings affect how pain is processed and how it is experienced, as well as how cognitive and affective factors sensitize some individuals to pain.



Stephen Scott

PROFESSOR
BIOMEDICAL AND
MOLECULAR SCIENCES,
MEDICINE

RESEARCH INTEREST:

Dr. Scott's lab studies voluntary motor function, computational neuroscience, robotics, and neurological assessment.



Jessica Selinger

ASSISTANT PROFESSOR
SCHOOL OF KINESIOLOGY
AND HEALTH STUDIES CROSS
APPOINTMENT, MECHANICAL
AND MATERIALS
ENGINEERING

RESEARCH INTEREST:

Dr. Selinger's research focus is on understanding the fundamental principles that underlie the neuromechanics of legged locomotion, as well as the application of these principles to wearable technology that can improve human mobility and overall health.



Garima Shukla

PROFESSOR
MEDICINE

RESEARCH INTEREST:

Dr. Shukla's research focus has been on the fascinating interface of sleep, cognition and behavior in epilepsy populations. Previous work investigated various non-seizure outcome determinants of quality of life among people with refractory focal epilepsy receiving surgical treatment. Research interests in Sleep Neurology include Restless legs syndrome and other primary sleep disorders with neurological co-morbidity.



Calvin Sjaarda

ADJUNCT ASSISTANT
PROFESSOR
PSYCHIATRY

RESEARCH INTEREST:

Dr. Sjaarda's research includes using bioinformatics, genomics, and big data to identify novel genetic, epigenetic, and environmental factors that contribute to the etiology of complex mental health disorders, genetic disorders, and infectious diseases.



Jonathan Smallwood

PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

The focus of Dr. Smallwood's research is the neural basis of higher order cognition. He uses machine learning and techniques such as EEG and MRI.



Erna Snelgrove-Clarke

VICE-DEAN (HEALTH
SCIENCES), DIRECTOR OF THE
SCHOOL OF NURSING
HEALTH SCIENCES

RESEARCH INTEREST:

Dr. Snelgrove-Clarke's areas of interest are healthcare, health care advocacy, maternal health, newborn health, and postpartum.



Claudio Soares

PROFESSOR
PSYCHIATRY

RESEARCH INTEREST:

Dr. Soares' primary research focus is on female-specific mood and anxiety disturbances, including: a) efficacy and safety of new treatments for premenstrual dysphoric disorder (PMDD); b) efficacy and safety of hormonal and non-hormonal strategies for the management of depression, sleep disturbances and other complaints (e.g., vasomotor symptoms) during the menopausal transition; c) risk factors associated with new onset of depression and anxiety during the menopausal transition.



Jeremy Stewart

ASSISTANT PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

Dr. Stewart's research focus aims to understand and quantify vulnerability to suicidal and self-injurious behavior in youth across distinct units of analysis (e.g., environmental circumstances, behavior, physiology). Our studies focus on how individual differences in executive functioning, trait impulsivity, stressful life events (particularly peer rejection), reward responsiveness, and other variables may contribute to the escalation from suicidal thinking to action in adolescents and young adults.



Patrick Stroman

PROFESSOR
BIOMEDICAL AND
MOLECULAR SCIENCES

RESEARCH INTEREST:

The focus of research in Dr. Stroman's lab builds upon important new developments that enable fMRI to be applied in the spinal cord and brainstem. This work significantly enhances the benefit of fMRI for neuroscience research and will eventually support clinical assessments. One key advantage of adding spinal cord fMRI to conventional brain fMRI is the ability to study distributed networks, such as related to pain or central sensitization, across the entire CNS from the cord to the cortex.



Donatella Tampieri

PROFESSOR
RADIOLOGY

RESEARCH INTEREST:

Dr. Tampieri's research interests are in the areas of cerebrovascular disease, stroke, aneurysm and arteriovenous malformation.

MEET OUR FACULTY



Martin ten Hove

PROFESSOR
OPHTHALMOLOGY

RESEARCH INTEREST:

Dr. ten Hove's research focus is on visual attention and concussion, ischemic optic neuropathies and vascular imaging.



Tracey Trothen

PROFESSOR
RELIGION, REHABILITATION
THERAPY

RESEARCH INTEREST:

Dr. Trothen is a social and biomedical ethicist who specializes in enhancement ethics, sport, spirituality, and Christianity.



Anita Tusche

TITLE: ASSISTANT PROFESSOR
DEPARTMENT: ECONOMICS,
PSYCHOLOGY

RESEARCH INTEREST:

Dr. Tusche's lab studies human decision-making in various domains (e.g. dietary behavior, altruism, consumer choice). To better understand the mechanisms that drive human decisions, they employ a variety of techniques (e.g., computer experiments, gaze pattern, functional and structural MRI) together with computational modelling approaches.



Sari Van Anders

PROFESSOR (CANADA 150
RESEARCH CHAIR IN SOCIAL
NEUROENDOCRINOLOGY,
SEXUALITY, & GENDER/
SEX, AND PROFESSOR OF
PSYCHOLOGY, GENDER
STUDIES, & NEUROSCIENCE)
PSYCHOLOGY AND GENDER
STUDIES

RESEARCH INTEREST:

Dr. Van Ander's explores sexuality, gender/sex and sexual diversity, and social modulation of hormones like testosterone, all with a feminist and queer (bio)science lens.



Gustavo Vazquez

PROFESSOR (MD, PHD, FRCPC)
PSYCHIATRY

RESEARCH INTEREST:

Dr. Vazquez's main scholarly activity is currently focused on the study of the clinical features, neurocognitive characteristics and pharmacological treatments of unipolar depression and bipolar disorders.



Jagdeep Walia

ASSISTANT PROFESSOR
MEDICINE

RESEARCH INTEREST:

Dr. Walia has an active clinical and basic genetics research program. His lab is focused on developing novel gene therapy approaches for inherited and

acquired neurodegenerative disorders. Currently they are focusing on GM2-gangliosidosis (Tay-Sachs, Sandhoff diseases and AB variant) and use adeno-associated virus vector (AAV) system as a tool for gene transfer to the central and peripheral nervous system.



Jeffrey Wammes

ASSISTANT PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:

The research in Dr. Wammes' lab uses behavioural, computational and neuroimaging methods to investigate how we learn, retrieve, and reorganize and strengthen information in memory. They are also interested in how mind wandering, attention and perception influence learning and memory.



Gavin Winston

ASSOCIATE PROFESSOR
MEDICINE

RESEARCH INTEREST:

Dr. Winston studies people with epilepsy aiming to improve their diagnosis and treatment using computational neuroimaging, machine learning and cognitive assessment. Examples include tractography and machine learning for surgical planning, microstructural imaging, robotic assessment and neuroimaging biomarkers of cognitive impairment.

MEET OUR

ADMINISTRATIVE TEAM



Don Brien

MR MANAGER

RESPONSIBILITIES:

Manages the daily operations and staff of the CNS MRI Facility.



Adrian Conway

FINANCIAL COORDINATOR

RESPONSIBILITIES:

Provides an advanced level of organizational, administrative and financial support to the Centre for Neuroscience Studies.



Mike Lewis

NETWORK ADMINISTRATOR

RESPONSIBILITIES:

Manages the network and server infrastructure for the Centre for Neuroscience Studies. Provides technical support to Faculty, Staff and Students within the centre.



Kelly Moore

PROJECT MANAGER

RESPONSIBILITIES:

Oversees finance and operations of the Centre and provides expertise with external funding opportunities.



Lucy Russo

GRADUATE ASSISTANT

RESPONSIBILITIES:

Provides administrative support to the Faculty Graduate Coordinator, graduate students and the graduate faculty in the CNS and acts as a liaison between this graduate program and the School of Graduate Studies (SGS).



Kim Suffron

SENIOR SECRETARY

RESPONSIBILITIES:

Provides secretarial support in the research environment for research faculty, staff and trainees. Kim provides support for all administrative bodies and committee within the Centre, the Neuroscience Lecture Series and the Neuroscience Outreach Program.

MEET OUR RESEARCH TEAM



Brooke Beattie
RESEARCH TECHNICIAN

RESEARCH RESPONSIBILITIES:

Identifies and recruits research participants, assists with data acquisition and administrative tasks in relation to the ongoing research project.



Helen Bretzke
COMPUTER PROGRAMMER/
DATABASE ADMINISTRATOR

RESEARCH RESPONSIBILITIES:

Writes analysis, data entry and reporting software for the Scott Lab. Manages storage and retrieval of experimental data.



Brian Coe
SENIOR RESEARCH SCIENTIST

RESEARCH RESPONSIBILITIES:

Specializes in the use of eye movements and neurophysiology for the study of decision-making (Coe et al., 2002), computational modeling (Coe et al., 2019), and neurodegeneration & neurodegeneration (Coe et al., 2017).



Ethan Heming
DATA ANALYSIS SOFTWARE
DEVELOPER

RESEARCH RESPONSIBILITIES:

Develop tasks for the Kinarm robot, analysis code for the lab, and handle website and webapp development.



Sean Hickman
MECHANICAL TECHNOLOGIST

RESEARCH RESPONSIBILITIES:

Support the development and production of novel research apparatus. Provide maintenance and adaptation support to ensure ongoing data collection.



Donna Kwan
ONDRI CLINICAL PLATFORM
LEAD

RESEARCH RESPONSIBILITIES:

Manage the ONDRI Clinical platform - act as a consulting scientist and clinician who liaises between the ONDRI Clinical and Neuropsychology Platforms, and the rest of the ONDRI and greater scientific community - design, develop, and execute novel data science solutions in collaboration with the ONDRI Neuroinformatics and Biostatistics group.



Natalia Lyra e Silva
RESEARCH ASSOCIATE

RESEARCH RESPONSIBILITIES:

Involved in various projects related to the neurobiology of Alzheimer's disease and the role of extracellular vesicles as intercellular communicators and as disease biomarkers. This includes creating new experimental design and tasks, analyzing experimental data, implementing experimental tasks/paradigms, data analysis and research communication in the form of publications, abstracts and presentations.



Dana Mika
RESEARCH TECHNICIAN

RESEARCH RESPONSIBILITIES:

Performs a variety of duties related to the day to day care, training and preparation for experiments of research animals. Primary responsibilities are to enable the advancement of research in the Munoz laboratories.



Jordan Miller

RESEARCH ASSISTANT

RESEARCH RESPONSIBILITIES:

Performs administrative tasks, data collection as well as data entry in the Scott Lab. Jordan also handles the care of non-human primates which includes behavioural training, surgical preparation, anesthetic administration, and health monitoring.



Kim Moore

RESEARCH ASSOCIATE

RESEARCH RESPONSIBILITIES:

Kim has worked with Dr. Scott since his position at Queen's started in 1995, and actually worked with him while he was a trainee at Queen's in 1992! She is responsible for the day to day operations in Dr. Scott's laboratories from administrative duties to data collection in multiple lab locations.



Lydia Wan

RESEARCH ASSISTANT

RESEARCH RESPONSIBILITIES:

Coordination of the molecular and non human primate research studies. This includes setting up protocols, conducting experiments as well as analysis of research data.



Martin York

COMPUTER PROGRAMMER

RESEARCH RESPONSIBILITIES:

Martin is responsible for developing software used to run sophisticated experiments involving robotic devices and virtual reality displays in the Flanagan and Gallivan labs. In addition, he carries out electronics work and manages the labs. Martin is responsible for training students and contributes to the design and implementation of experiments.

MEET OUR

POSTDOCTORAL FELLOWS



Andrea de Lima-Pardini

PHD: UNIVERSITY OF SÃO PAULO - BRAZIL

Currently working with Dr. Stephen Scott.

RESEARCH INTEREST:

Andrea's current research uses an animal model to investigate neuronal reorganization and motor impairments after focal brain cooling (virtual lesion). Her main interests comprise the neural correlates of movement disorders and rehabilitation.



Jolande Fookien

PHD: UNIVERSITY OF BRITISH COLUMBIA, VANCOUVER, BC

Currently working with Dr's Jason Gallivan and Randy Flanagan.

RESEARCH INTEREST:

Jolande's research focusses on eye and hand movement control during naturalistic tasks that require quick sensorimotor predictions and decisions. In particular, she is interested in understanding the underlying mechanisms of the interplay between eye and hand movements at different stages of sensorimotor decisions and how the two systems work in synergy during everyday tasks.



Peter Gagolewicz

PHD: QUEEN'S UNIVERSITY

Currently working with Dr's David Andrew and Brian Bennett

RESEARCH INTEREST:

Peter work involves synaptic plasticity, Alzheimer's, and ischemic stroke. His doctoral research examined synaptic plasticity and metaplasticity in the adult brain, especially how it relates to learning and memory. More recently he has have taken an interest in hippocampal plasticity in animal models of Alzheimer's disease, as well as the cellular mechanisms of neuronal damage during ischemic stroke.



Hui Guang

PHD: TSINGHUA UNIVERSITY, BEIJING, CHINA

Currently working with Dr. Stephen Scott

RESEARCH INTEREST:

Hui's Ph.D work is mainly focused on modeling of sensorimotor control, including the modeling of proprioceptive recognition with ANN, state estimation with Bayesian filtering, and spinal reflex of focal vibration. He is currently working on the neural substrates of sensorimotor control with non-human primates, including the cocontraction and gain scaling effect.



Gabriel Ramirez

PHD: NATIONAL
AUTONOMOUS UNIVERSITY
OF MEXICO, MEXICO

Currently working with Dr. D.J. Cook.

RESEARCH INTERESTS:

Gabriel's work is mainly focused on identifying stroke biomarkers using multimodal MRI, structural and functional, in order to develop and assess novel rehabilitation therapies and validate stroke recovery. He is currently working with a nonhuman primates stroke model to optimize, validate and evaluate a neuromodulation interface for stroke rehabilitation.



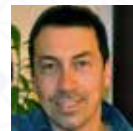
**Ehsan Sherafat
Kazemzadeh**

PHD: SHIRAZ UNIVERSITY OF
MEDICAL SCIENCES, SHIRAZ,
IRAN

Currently working with Dr. D.J. Cook.

RESEARCH INTEREST:

Ehsan was the Principal Investigator in two large international clinical trials in Iran (CRASH-1 and CRASH-2, supervised by the London School of Hygiene and Tropical Medicine in England, 2002-2009). Moreover, Ehsan was involved in more than 14 major research projects as PI or Co-PI, and has more than 28 publications and presentations, mainly in epilepsy surgery, functional neurosurgery and neuro-trauma.



Brian White

PHD: JUSTUS LIEBIG
UNIVERSITY GIESSEN,
GERMANY

Currently working with Dr. Doug Munoz

RESEARCH INTEREST:

Brian studies the circuits and processes associated with visually guided eye movements using specialized eye movement tasks, and single/multichannel extracellular recording techniques in brain areas such as superior colliculus and the primary visual cortex (V1).



RESEARCH

In 2020, the CNS went through a process of identifying research themes that represent major strengths and opportunities for the CNS to guide and support future training, growth and development. Four research themes were identified.

DECISION MAKING AND ADAPTIVE CONTROL

Executing a particular action in any context relies on a complex suite of neurocognitive processes that allow us to select the most appropriate action from a range of closely competing alternatives, project and monitor performance for evidence of error, and when there are errors adapting one's decision-making processes to arrive at maximal efficacy. These processes govern everything from relatively simple motor actions like figuring out how to grasp an object, to complex social decisions like deciding whether and how one might like to share scarce resources. Successful adaptive decision making is one of the hallmarks of neurocognitive development and difficulties in adaptive decision making are characteristic of a wide range of neuropsychological and psychiatric conditions. The goal of this research group is to understand principles that influence decision making and actions, how factors such as cognitive and conceptual development, emotions, limb mechanics, environment influence these choices and how adaptive decision making can be impacted by disease, injury and aging. The group is co-led by Dr. Anita Tusche from Psychology and Dr. Stephen Scott from DBMS.

Decision-Making Adaptive Control (DMAC) meetings of faculty and trainees are designed to discuss ongoing research in areas including (but not limited to): decision making, neuroeconomics, information processing, adaptive control, and motor control.

Until July 2021, DMAC meetings took place monthly (virtual) and focused on trainees giving short presentations (~2 student-led talks per meeting). The meetings aimed to provide opportunities for early career researchers (graduate students, postdocs) to present their ongoing and upcoming research projects and receive feedback from the group, and to also foster interactions and new research collaborations across labs. To better facilitate this goal, the group created a proper trainee e-mail list for those interested in the DMAC meetings.

In Fall 2021 and Winter 2022, the DMAC meetings focused on PI presentations of large-scale research initiatives. For example, in November 2021, Dr. Gallivan presented a collaborative project on the neurobiological basis of social distancing in non-human primates at CNS. The project involves collaborations with several PIs of the DMAC group and was selected for funding in the Wicked Idea competition (2021) and the New Frontiers in Research Fund – Exploration competition (2022), highlighting the research potential of collaborative research of members of the DMAC theme. In February 2022, Vincent DePaul presented an overview of the Oasis Project, a program designed to strengthen and sustain healthy communities of older adults.

To identify potential funding opportunities for the DMAC Research Theme, several faculty members of the DMAC group contributed to a CFI application spearheaded by Dr. Scott. While ultimately not selected for funding, the initiative illustrates the theme's motivation to secure funding and enable research on decision-making and adaptive control at Queen's University. Efforts are now underway to link these research initiatives within DMAC to a multi-institutional research opportunity and led at Queen's by Dr. Blohm.

MOOD DISORDERS

The mood disorders group is a group of researchers dedicated to study Anxiety, Bipolar Disorder, Depression and Suicide in children, adolescents, adults and seniors. The group attends regular bi-monthly meetings to generate the discoveries that are going to transform our patient's lives, we use many different methods and approaches. We have researchers looking at psychometrics, biomarkers, neurobiological factors, genetics, neuropsychological factors, intervention methods, and prevention methods, just to name a few. We have researchers from Psychiatry and Psychology, but also from DBMS and other disciplines and collaborators from other departments, across Ontario and Canada and also in other countries. In the future, we would like to consolidate our national and international leadership, bringing our large group

of psychiatrists, psychologists, geneticists, and neuroscientists to look at precision medicine interventions, ultimately achieving prevention, early detection and individualized treatments. The group is co-led by Dr. Beth Kelley from Psychology and Dr. Elisa Brietzke from Psychiatry.

NEURODEGENERATION

The neurodegeneration group explores how various neurological disorders impact brain function and potential therapeutic interventions. There is not one cohesive project that the group is focused on, rather the individuals are focusing on multiple disorders (e.g., stroke, Parkinson's Alzheimer's, Huntington's, COVID, etc). There are many different experimental approaches being used in the group including genetics, surgery, physiology, behavioural, molecular and the research programs include rodent, NHP and human studies. The group is led by Dr. Doug Munoz in DBMS.

PAIN

The Pain Research Group includes the Pain Chronobiology and Neuroimmunology Laboratory (led by Dr. Nader Ghasemlou), the Pain Affect and Cognition Laboratory (led by Dr. Tim Salomons), and the Kingston Health Sciences Centre's Department of Anesthesiology Chronic Pain Clinic (led by Drs. Scott Duggan and Etienne Bisson), as well as key members from the Departments of Anesthesiology, Biomedical & Molecular Sciences, Critical Care Medicine, and Psychology, among others. Using both laboratory models of pain and working with participants from across Canada and the world, key areas of interest for the Research Group include studying the molecular, cellular, and behavioural underpinnings of pain. More broadly, the team is working to bridge these various levels of research to develop a more translational study of the

basic aspects of pain. The Centre for Neuroscience Studies at Queen's University brings together an inter-disciplinary team of neurobiologists, psychologists, immunologists, geneticists, sociologists, and pain clinicians to better understand why we feel pain, what we can do to better serve those suffering, and how to treat pain more effectively. The Pain Research Group at Queen's seeks to study bridge the gap that often exists between the clinic and basic scientists to bring new discoveries more rapidly to those suffering. The group not only works with people living with pain, but also those with chronic diseases where pain plays an important role including multiple sclerosis, Lyme disease, spinal cord injury, fibromyalgia, and arthritis to provide a better understanding of how pain and disease intersect.

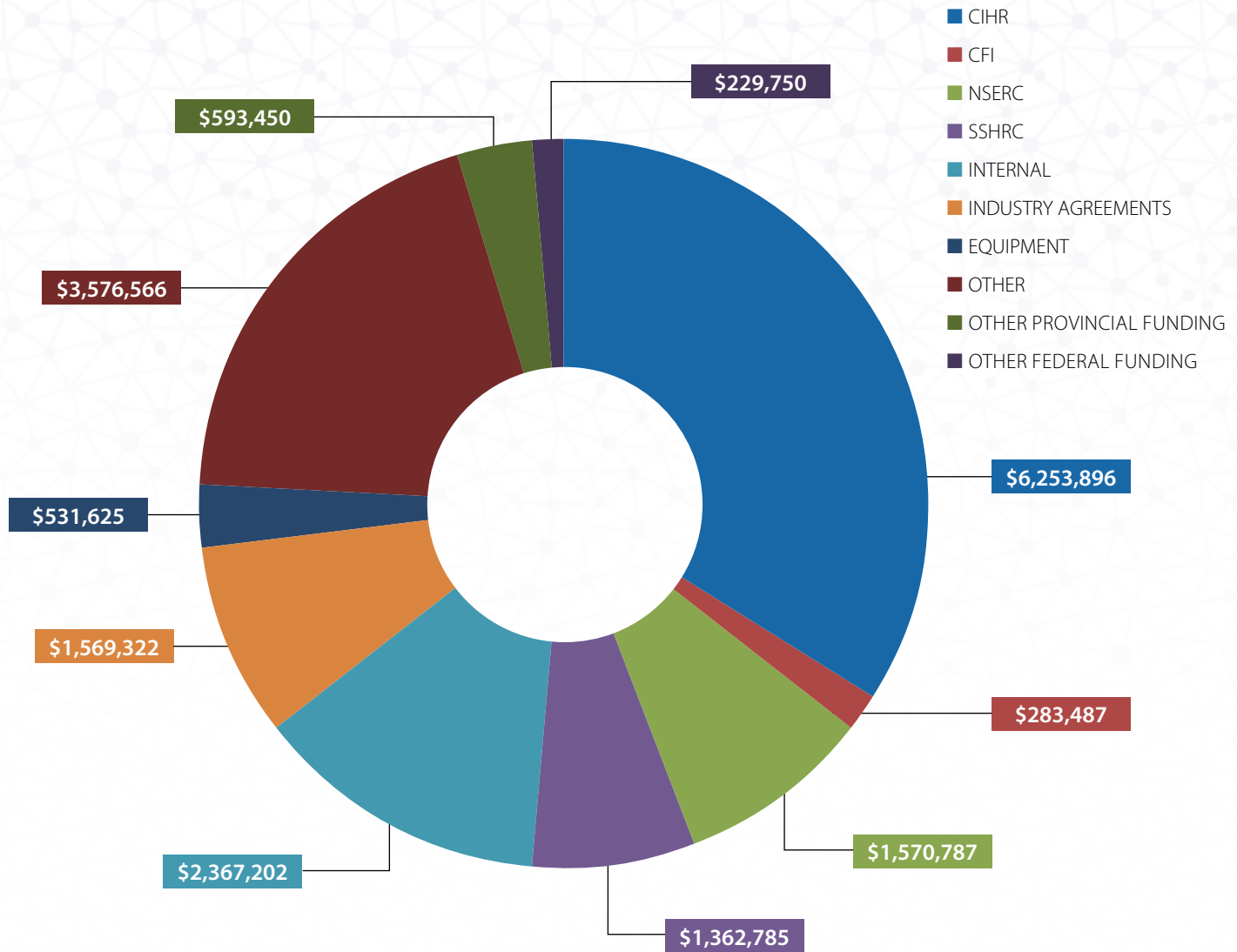
This group was successful in receiving funding for a project "The Emerging Disease Genetics & Ecology (E.D.G.E) of Lyme" (co-PIs: Robert Colautti [Biology] and Nader Ghasemlou [Anesthesiology/DBMS]; co-Is: Che Colpitts [DBMS]. Qingling Duan [Computing], Rylan Egan [Health Quality], Tim Salomons [Psychology], and Sarah Yakimowski [Biology]). This has resulted in a NFRF Transformation, CIHR, NSERC and SSHRC applications from individuals in the group. This group meets monthly to discuss project updates. The EDGE of Lyme held a Queen's-funded Hack-a-Thon (held January 22-30, 2022), where over 50 undergraduate students at Queen's from across departments and faculties worked together to study various biopsychosocial aspects of Lyme disease. Each team worked to develop a novel platform or tool for improved discovery, treatment or knowledge translation for Lyme disease. In addition, The Translational Neuroimmunology Group meets bi-weekly for a journal club (with Drs. Faith Brennan [DBMS], Sebastien Talbot [DBMS] and Christophe Altier [U Calgary]). Upwards of 50+ trainees attend these meetings weekly from all 4 groups

RESEARCH OUTCOMES

CNS Funding 2021/22

TOTAL FUNDING

\$18,338,873



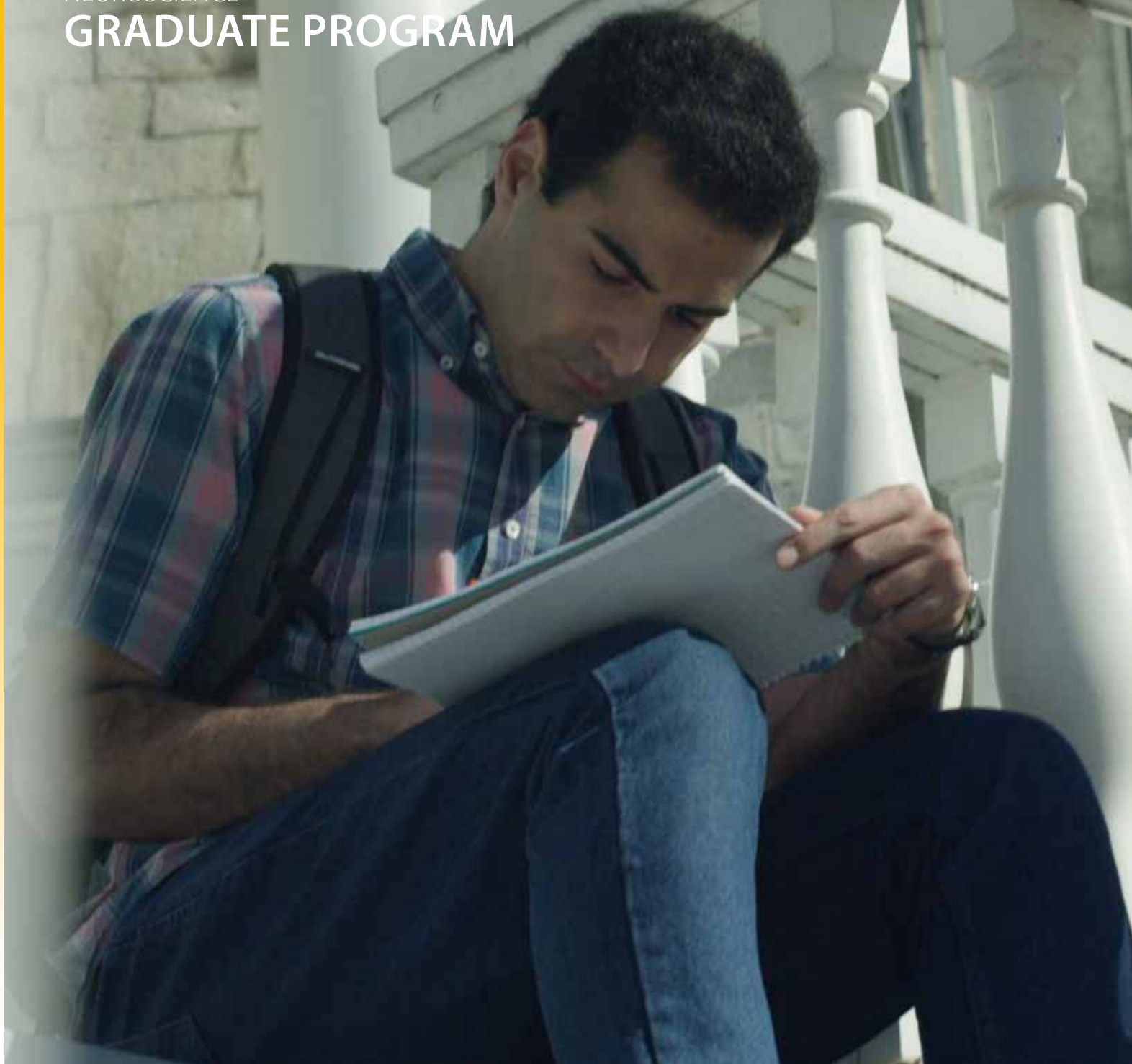
1902

Refereed Journal Articles and Citations

In 2021 faculty members from the Centre for Neuroscience Studies published **1902** refereed journal articles and had over **73,865 citations**.

NEUROSCIENCE

GRADUATE PROGRAM



NEUROSCIENCE GRADUATE PROGRAM

The Neuroscience Graduate Program is a very dynamic program that always thrives to stay at the cutting edge of research training and career mentorship. In the past year, we have added two courses to our portfolio, covering neuropsychiatry and deep learning for neuroscience. We have also solidified the program's commitment to quantitative training by making our new quantitative neuroscience course on modern data analytics in Python mandatory for all MSc students. As part of our ongoing strategy to increase recognition of outstanding graduate students as well as to increase equity, diversity and inclusion, we have also added several scholarships to our program, including an indigenous and black student entrance scholarship. These and future changes ensure that our program stays internationally competitive and attracts the best and brightest students from around the world. We are very proud to report that our Neuroscience Graduate Program Coordinator, Dr. Gunnar Blohm, is the recipient of the 2022 Queen's Health Sciences Education Award. This award recognizes excellence in teaching methods, course or curriculum design, course organization, development of learning resources, education technology, evaluation and innovation. Dr. Blohm continues to bring this innovation to the Centre for Neuroscience Studies graduate program.

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This program is truly transformational; my experience as an emerging researcher in CNS has been remarkable and has been shaped by outstanding faculty, staff and students who are supportive, inspirational, and truly pleasant to work with.

Hanin Alsaadi, PhD Candidate, Centre for Neuroscience Studies

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MEET OUR

PhD STUDENTS

Hanin AlsaadiKawaja Lab
Rafaella Araujo Goncalves da SilvaMunoz/De Felice Labs
Aleksandar BioracVazquez Lab
Celina Caesar-ChavannesSnelgrove-Clarke Lab
Olivia CalancieKhalid-Khan Lab
Maude Champagne.....Reynolds Lab
Alba Chavez Ramos.....Reynolds Lab
Arthi Meyyappan.....Milev Lab
Benjamin Cuthbert.....Blohm Lab
Guilherme de FreitasMunoz Lab
Natalie DeschenesWalia Lab
Sydney DoreBlohm Lab
Arefeh Farahmandi Najaf Abadi.....Blohm Lab
Adriana Farcas.....Iftene Lab
Ashleigh Forsyth.....Groll Lab
Evan ForthMilev Lab
Daniel GaleGallivan Lab
Pauline GaprielianLevy Lab
Kathleen Harrison.....Cook Lab
Po (Jeff) Yueh HuangMunoz Lab
Natasha JawaBoyd Lab
Janis Kan.....Munoz Lab

Jasmine KhanBoyd Lab
Ryan Kirkpatrick.....Khalid-Khan/Munoz Labs
Elena KoningBrietzke Lab
Matthew Laporte.....Blohm Lab
Chloe Lowry.....Andrew/Bennett Labs
Angela LuedkeMunoz Lab
Michael McGarity-ShipleyGallivan Lab
Kathryn McIntosh.....Levy Lab
Theresa MclverCraig Lab
Blake NoyesKhalid-Khan/Munoz Labs
Samira OsmanLomax Lab
Kayne Park.....Scott Lab
Karys Peterson-Katz.....Reynolds Lab
Brianna Quinville.....Walia Lab
Heidi Riek.....Munoz Lab
Scott RobsonKuhlmeier Lab
Scott Squires.....Poppenk/Milev Labs
Ayssar Tashtush.....Lomax Lab
Kaitlyn TresidderBennett Lab
Troy WebsterWalia Lab
Rachel Yep.....Munoz Lab
Tianyao ZhuGallivan/Flanagan Labs

MEET OUR

MSc STUDENTS

Theodore Aliyianis Winston Lab
Parsa Balalaie Scott Lab
Alexander Bambokian Brietzke Lab
Robyn Binsfeld Walia Lab
Hayley Bromley Milev Lab
Honey Bryant Chu Lab
Tina Chalhoub Walia Lab
April Christiansen Scott Lab
Salma Farag Freire Lab
Colleen Fleury Scott Lab
Ian Goodall-Halliwel Smallwood Lab
Dominique Hancock Andrew Lab
Julia Hellas Andrew Lab
Kaitlyn Hoesterey Blohm Lab
Jasleen Jagayat Alavi Lab
Miruna Jurj Sjaarda Lab
Nazgol Kafei Shahbaz Walia Lab
Dure Khan Alkins Lab
Edwin Kiarie Andrew Lab
Marian Lazaj Shukla Lab

Bernie Longange Kawaja Lab
Jack Lott Scott Lab
Isabelle Mastantuono Baharnoori/Scott Labs
Emils Matiss Blohm Lab
Alexandra McLaren Kawaja Lab
Landon Montag Solomans Lab
Bridget Mulholland Smallwood Lab
Nilloofar Nikjoo Alavi Lab
Tesla Peretti Walia Lab
Aaron Philipp-Muller Alavi / Reshetukha Labs
Kiran Reehal Appireddy Lab
Lydia Reid Scott Lab
Cassandra Sgarbossa Milev Lab
Tishani Sritharan Milev Lab
Callum Stephenson Alavi Lab
Elise Stevens Magoski Lab
Kabeer Thaker Rullo Lab
Maxwell Topley Kawaja/Hendry Labs
Rebecca Wood Chu Lab

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Words of Wisdom: My thesis project had once begun as a volunteer venture of mine, and at its beginning I had no intention of writing an entire thesis centered on its development, nor did I ever think that I would pursue a Master's degree in general; however, in a very transformative and uncertain time of my life during my 4th year of undergraduate studies, this project soon provided me with a sense of direction, passion, and purpose. While I faced much doubt about my ability to succeed as a graduate student with minimal research experience, my passion for improving the functionality of patients with stroke pushed me onward. As Dr. Scott has said, "If you want change, you cannot sit on the sidelines." Trust yourself and the process of research and the rest will follow. Welcome new graduates to the CNS and congratulations to my fellow grads!

”

April Christiansen, MSc Candidate, Centre for Neuroscience Studies

PHD GRADUATE STUDENT AWARD RECIPIENTS



Rafaella Araujo Goncalves de Silva

– GORDON WALLACE SWAN MEMORIAL FELLOWSHIP

Rafaella has an undergraduate degree in Biological Sciences and a Master of Science degree in Biological Chemistry from the Federal University of Rio de Janeiro, in Brazil. She is currently pursuing her PhD at Queen's University in labs of Dr Munoz and Dr De Felice. Her doctoral research project aims to investigate the link between Alzheimer's disease (AD) and Type 2 diabetes (T2D), which has been shown to double the risk of developing AD later in life. During her doctoral studies, Rafaella has been particularly interested in elucidating the role of inflammation and tau protein in triggering and aggravating cognitive and peripheral metabolic alterations in AD patients. More recently, she has been also involved in the identification of blood-based biomarkers associated with the diagnosis and progression of different neurodegenerative diseases.



Aleks Biorac (PhD)

– THE DR. ROBERT J. WILSON FELLOWSHIP

Aleks completed his BSCh majoring in Life Sciences at Queen's University in 2019. He began his PhD studies the same year under the supervision of Dr. Gustavo Vazquez, a psychiatrist at Providence Care Hospital. Currently, his studies focus on the characterization of treatment-resistant depression and the exploration of experimental ketamine treatment on clinical and behavioural outcomes.



Maude Champagne (PhD)

– LATHAM FAMILY AWARD

Maude Champagne is a Neurosciences PhD Student under the supervision of Dr. James Reynolds. Maude has an MSW with a thesis on the Experience of parents raising children with FASD and developmental trauma during the Dyadic Developmental Psychotherapy (DDP) from Université du Québec en Outaouais. Maude also has a Social Work undergrad from Laurentian

PHD GRADUATE STUDENT AWARD RECIPIENTS

University. Her research interests include neurodevelopmental disorders, program evaluation and developmental trauma.



Guilherme de Freitas (PhD)

– THE ERNEST AND MAYME WEBBER ENDOWMENT IN ALZHEIMER'S RESEARCH

Guilherme is a Ph.D. Student in the Neuroscience Graduate Program at Queen's University. He has a Master's in Biochemistry from the Federal University of Rio de Janeiro (2017), and, a Bachelor in Biological Sciences, with a minor in Microbiology and Immunology, also from the Federal University of Rio de Janeiro (2014). Guilherme is currently in the Munoz lab investigating the possible chronic neurological alterations caused by systemic or central severe SARs-CoV-2 infection through a non-invasive biomarker approach.



Benjamin Cuthbert (PhD)

– ONTARIO GRADUATE SCHOLARSHIP (OGS)

During his undergraduate degree in Life Science, Ben was fortunate enough to land a research position in Dr. Gunnar Blohm's neuroscience lab. He quickly saw the error of his math-less ways, and developed an affinity for modeling. Now he works with Drs. Blohm and Paré in the Centre for Neuroscience Studies, where he uses a variety of computational approaches to study short-term memory. When he's not working, he enjoys playing with dogs, synthesizers, and snowboards.



Ashleigh Forsyth

– LATHAM FAMILY AWARD/QE II GSST

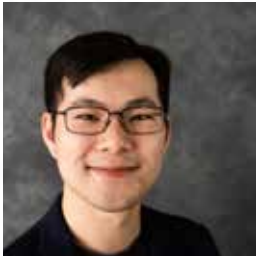
MI A Veteran of the Canadian Armed Forces, Ashleigh has dedicated her academic career to researching mental health among the military. She completed her undergraduate degree in psychology through Thompson Rivers University and her Master of Science in Rehabilitation Science at Queen's University. Ashleigh is currently completing the second year of her PhD at the Centre for Neuroscience Studies at Queen's under the supervisor of Dr. Dianne Groll. Her focus is on treatment programming for posttraumatic stress disorder among military and public safety personnel.



Daniel Gale (PhD)

– NSERC GRADUATE SCHOOL SCHOLARSHIP

Dan is a fourth-year PhD Candidate supervised by Dr. Jason Gallivan in the Memory, Action, and Perception Lab, and by Dr. Randy Flanagan in the Cognition and Action Lab. Broadly, Dan uses functional MRI to study interactions between motor, sensory, and cognitive systems during object manipulation and motor learning tasks. In addition, he leads the development of non-human primate neuroimaging pipelines for the CNS and works on various open-source software packages for neuroimaging.



Jeff (Po) Huang (PhD)

– GORDON WALLACE SWAN MEMORIAL FELLOWSHIP

Jeff (Po Yueh) Huang is a PhD candidate under the supervision of Dr. Doug Munoz. He is studying the use of pupillometry in probing brain functions in natural aging and neurological disorders. Jeff works in part with the Ontario Neurodegenerative Disease Research Initiative to study pupil dynamics in neurodegenerative diseases associated with dementia. His research aims to provide a simple and non-invasive early marker for the detection of these diseases.



Natasha Jawa (PhD / MD)

– CIHR

Tasha is a second-year MD/PhD candidate supervised by Dr. J Gordon Boyd. Prior to entering the MD/PhD program, Tasha completed an honours BSc in neuroscience and psychology at the University of Toronto, and concurrently completed her MSc at the University of Toronto while working as a clinical research manager in the Division of Nephrology at SickKids. Tasha's PhD work combines her passion for neuroscience, nephrology, and patient safety, by investigating short- and long-term neurological, neurocognitive, and functional changes in critically ill adults treated with dialysis in the intensive care setting.

STUDENT AWARD RECIPIENTS

EXTERNAL AWARD HOLDERS



Jasmine Khan (PhD / MD)

– VANIER

Jasmine is a 4th year MD/PhD candidate in Dr. Gord Boyd's lab. She is currently exploring the impact of decreased cerebral perfusion in critically ill patients in the intensive care unit (ICU). She is conducting a multi-centre clinical study to understand the relationship between cerebral perfusion, delirium, and long-term cognitive outcomes in ICU survivors. In doing so, Jasmine hopes to gain insight into the underlying processes that lead to poor recovery from critical illness.



Ryan Kirkpatrick (PhD)

– VANIER

Ryan is completing her third year in the MD/PhD Program and is supervised by Dr. Doug Munoz, Dr. Linda Booij and Dr. Sarosh Khalid-Khan. Ryan completed her undergraduate degree at Queen's in Life Sciences and Psychology and completed a mini-master's in the CNS in 2019. For her doctoral studies, Ryan is running a multi-site study aimed at increasing knowledge surrounding cognitive control of saccadic eye movements in youth with eating disorders. The end goal of Ryan's project is to identify objective, rather than subjective, measures of eating disorders and treatment response in youth.



Chloe Lowry (PhD)

– THE QUEEN'S GANG AWARD

Chloe is a fourth year PhD candidate co-supervised by Dr. David Andrew and Dr. Brian Bennett investigating the molecular mechanisms underlying spreading depolarization as it relates to stroke. She is also interested in how various social determinants of health can affect stroke outcome in clinical populations. Chloe previously completed her BScH (Life Sciences) in 2014 and her MSc (Neuroscience) in 2017, both at Queen's. She has been heavily involved in NOP throughout her time in the CNS and currently serves as the Co-Coordinator of the Kingston Brain Bee competition.



Kathryn McIntosh (PhD)

– THE ERNEST AND MAYME WEBBER ENDOWMENT IN ALZHEIMER'S RESEARCH

Kathryn McIntosh is a PhD candidate in Dr. Ron Levy's lab. She completed an undergraduate degree in Electrical Engineering with a minor in Biomedical Engineering and certificate in Entrepreneurship, Innovation and Small Business at the University of Toronto before direct entry into the PhD program at Queen's University. Kathryn developed a kindling model of epilepsy in a primate, and she uses this model to study the electrical interactions that support memory in the healthy and epileptic brain. She records simultaneously from several deep brain regions as primates learn to navigate in a 3D virtual reality world. She uses electrical stimulation, pharmacological manipulation, and signal processing techniques to investigate primate neural processes. Her work provides insight into the mechanisms underlying neural disorders and the physiologic basis of learning and memory.



Blake Noyes (MSc)

– LATHAM FAMILY AWARD/MCLAUGHLIN

Blake received her BSc in Psychology at Queen's University in 2018. Blake will be completing her mini-master's at the Centre for Neuroscience in the summer of 2021 and plans to begin her PhD in the fall of 2021. Blake is co-supervised by Dr. Doug Munoz, Dr. Linda Booij, and Dr. Sarosh Khalid-Khan. Her research focuses on using eye-tracking to characterize subthreshold depression in adolescents at Kingston General Hospital.



Heidi Riek (PhD)

– WILSON/PARKINSON'S SOCIETY AWARD

Heidi is a second-year PhD student under the supervision of Dr. Doug Munoz. In her work with the Ontario Neurodegenerative Disease Research Initiative, Heidi uses video-based eye tracking to characterize saccadic eye movement behaviour in several neurodegenerative disease populations. Heidi is also interested in the effect of genetic variants on eye movements. Prior to doctoral studies, Heidi received her B.Sc.H. from Queen's University (2017) and completed a mini-master's in the CNS (2019).

STUDENT AWARD RECIPIENTS

EXTERNAL AWARD HOLDERS



Scott Squires (PhD)

– NSERC GRADUATE SCHOOL SCHOLARSHIP

Scott completed his B.Sc. (Hons.) in Psychology and Medical Sciences in 2014 at the University of Western Ontario. Afterwards, he spent two years at Western as a research assistant among three labs, studying visuomotor neuroscience (under Dr. Jody Culham), cognitive risk factors for depression (under Dr. David Dozois), as well as suicide risk and resilience factors in elderly individuals (under Dr. Marnin Heisel). From 2016-2019, Scott completed his M.Sc. in Clinical Psychology at Queen's, studying the associations among types of childhood maltreatment, frontoamygdala functional connectivity at rest, and depression symptom severity (under Dr. Kate Harkness). Scott is in the second year of his Ph.D. at the Centre for Neuroscience Studies, under the co-supervision of Dr. Jordan Poppenk & Dr. Roumen Milev. Here, he is using psychometric analysis and functional MRI to study the links between life stress, emotion, brain functional connectivity, and rumination (i.e. the tendency to dwell on negative thoughts, feelings, or events) in psychologically healthy individuals and in individuals with a recent history of prolonged psychological distress (e.g. depression, anxiety, etc.)



Kaitlyn Tresidder (PhD)

– HUGH GIBSON MEMORIAL

Kaitlyn is a fourth-year PhD candidate in the lab of Dr. Brian Bennett. She completed her undergraduate degree at Queen's University, receiving a BScH (Life Sciences) in 2015. She then joined the Centre for Neuroscience Studies and completed a MSc in 2017 studying the chronobiology of pain with Dr. Nader Ghasemlou. Currently, Kaitlyn is interested in neurodegenerative disorders, and her research primarily focuses on the contribution of oxidative stress to the progression and pathology of Alzheimer's disease. After graduate school, Kaitlyn wishes to pursue a career as a clinician-scientist.

MSC GRADUATE STUDENT AWARD RECIPIENTS



Alexander Bambokian (MSc)

– CIHR

Alexander graduated with a Bachelor of Science (Honours) degree in Life Sciences from Queen's University in 2020. Alexander's interest in the relationship between mental health and nutrition resulted in his application to the Queen's Masters of Neuroscience program, where the ongoing research conducted by Dr. Brietzke aligned with his fields of interest. This lab currently investigates the effects of the ketogenic diet on major depressive disorder, a domain of nutritional psychiatry that has yet to be investigated but has shown promising clinical outcomes in other mental and neurological disorders.



April Christiansen (MSc)

– QUEEN'S GANG AWARD

April Christiansen completed her bachelor's degree in Life Sciences at Queen's University and immediately transitioned into an accelerated MSc in Clinical Neuroscience. April's thesis project, under the supervision of Dr. Scott & Dr. DePaul, explores the feasibility of Art-based Rehabilitation Therapy (ART) for improving sensorimotor function in stroke survivors. April's research interests expand beyond stroke rehabilitation – she is also involved in several ongoing research projects in Vancouver, BC pertaining to medical cannabis safety and efficacy. Upon completion of her MSc, April looks forward to translating her research into clinical practice and pursuing a career in medicine.



Julia Hellas (MSc)

– BOAG/MCLAUGHLIN

Julia Hellas is a master's student with the Queen's Centre for Neuroscience Studies, and was awarded the Boag Family Endowment in Neuroscience and the McLaughlin Fellowship this past academic year (2021-2022). Julia began her MSc in September 2021 under the supervision of Dr. R. D. Andrew. Her research is in cellular neuroscience and aims to identify what initiates the brain damage caused by stroke. So far, Julia's lab has collected some very compelling evidence for the existence of a molecule that initiates the damage caused during stroke. Julia's project is building upon these data by performing further experiments and analyses to try to identify this molecule.

MSC GRADUATE STUDENT AWARD RECIPIENTS



Kaitlyn Hoesterey (MSc)

– ONTARIO GRADUATE SCHOLARSHIP (OGS)/GRADUATE ENTRANCE AWARD

Kaitlyn Hoesterey is a first-year master's student in Dr. Gunnar Blohm's lab. Her current research is focused on investigating the functional roles of E/I balance in the brain via a spiking recurrent neural network model. Outside of research, Kaitlyn works as an escape room artist and enjoys tinkering with hobby electronics to create unique, interactive puzzles.



Edwin Kiarie (MSc)

– QUEEN'S GANG AWARD

Edwin is passionate about the social issues that affect the community, particularly with respect to physical and mental health. Edwin finds it incredibly fulfilling working to understand the world in which we live, as well as the way we relate with it. Edwin feels that using his own knowledge to impact those around him in meaningful ways is an art he enjoys. In terms of his work, Edwin is interested in the intersection of Neuroscience research, medicine and education. In his personal life, Edwin enjoys gaming, music production, cooking, photography and travelling.



Alexandra McLaren (MSc)

– WEBBER/MCLAUGHLIN FELLOWSHIP

Alex McLaren was accepted into the accelerated graduate studies program with the Centre for Neuroscience Studies at Queens University. Alex is on track to complete her Master's in Neuroscience by June 2022 and was accepted to the University of Toronto to pursue a career as a physician. Alex aspires to work with patients diagnosed with neurodegenerative diseases. Her fascination with the nervous system is largely attributed to the journey she took with her father, who unfortunately passed away from a neurodegenerative disease (ALS) in 2020. Alex's master's thesis project looked at olfactory bulb proteome changes in response to Alzheimer's disease-related pathologies in mouse and rat models. She is completing her degree under the supervision of Dr. Michael Kawaja.



Landon Montag (MSc)

– FRANKLIN BRACKEN FELLOWSHIP

Landon is a 2nd year MSc student under the co-supervision of Drs. Etienne Bisson & Tim Salomons. Her research examines the effects of pain, cognition, and emotion on treatment outcomes for chronic pain management.



Aaron Philipp-Muller (MSc)

– FRANKLIN BRACKEN FELLOWSHIP/LATHAM AWARD

Aaron began his masters in the fall of 2020 under the supervision of Nazanin Alavi and Taras Reshetukha. Aaron's project has investigated the use of ketamine combined with online psychotherapy for the treatment of post-traumatic stress disorder. Aaron's research interest centres around trauma and stressor-related disorders, treatment access, psychedelics, and pharmacologically enhanced psychotherapy.



Cassandra Sgarbossa (MSc)

– ONTARIO GRADUATE SCHOLARSHIP (OGS)

Cassandra completed her undergraduate degree at the University of Guelph, in Guelph, ON, Canada. She initially started out in the Psychology program, but quickly realized that her research interests were much more aligned with neuroscience and more specifically, the science behind psychiatric illnesses. Cassandra received her BA (Honours) in Psychology with a Minor in Neuroscience. She is very passionate about mental health research and awareness, which is why she is currently doing her MSc thesis on a new microbial therapeutic product and its long-term effects on symptoms of depression, under the supervision of Dr. Milev. Cassandra's current research interests are focused on gut health, microbe therapy, clinical neuroscience, and depression.

MSC GRADUATE STUDENT AWARD RECIPIENTS



Callum Stephenson (MSc)

– CIHR AWARD

Callum graduated from Queen's University in 2020 with a Bachelor of Science (Honours). He is currently completing his Master of Science in Neuroscience under the co-supervision of Dr. Roumen Milev and Dr. Nazanin Alavi in the Queen's University Online Psychotherapy Lab (QUOPL). Callum is leading a pilot study investigating the pathophysiology of obsessive-compulsive disorder using electronically delivered cognitive behavioural therapy and functional magnetic resonance imaging. Callum is passionate about furthering his research in the hopes of influencing health policy for more accessible and equitable mental health care delivery.



Elise Stevens (MSc)

– MCLAUGHLIN AWARD

Elise is a part of Dr. Magoski's lab and is researching a current in the bag cell neurons of the marine snail, *Aplysia californica*, that is activated by the phospholipase C pathway. In her free time she enjoys reading, cooking, and watching cat videos.

STUDENT LEADERSHIP



While we hoped that this year we could finally put COVID behind us, we had to push through another disrupted year. Despite the challenges of transitioning to a hybrid learning model, we successfully implemented several initiatives this year that we are very proud of. One of the key aspects that we focused on was promoting a sense of unity and togetherness in yet another isolating year. We did our best to provide in-person events at the start of the year but quickly found ourselves facing another lockdown. As a result, we switched to planning online socials. As COVID restrictions have finally begun to lift, we planned some in-person socials to finish off the year.

To foster new and old connections alike we are incredibly excited that we will soon start offering twice-weekly coffee breaks for students, staff, and faculty. We hope that this will give students an opportunity to meet their peers from different labs so as to form new friendships and reveal opportunities for collaboration. One of the weekly breaks will be hosted in Botterell Hall, while the other will be held at different locations where CNS students and faculty work.

At this year's Town Hall we heard from students who were concerned about their financial situation. About 70% indicated that they had a monthly budget deficit and we are working with CNS committees and admin to explore all avenues available to address the rising cost of living. A silver lining was that many students felt that they are on track with their degree progress despite two difficult years. Most students also feel supported and accepted by their labs and supervisors.

We had the pleasure of working with CNS students, faculty, and staff to achieve the following accomplishments:

1. Remote brownie baking session - we created DIY brownie kits and distributed them to students. We also ran a Zoom baking session to encourage students to bake and enjoy their brownies together.
2. CNS MiiR tumblers - we designed and ordered CNS branded tumblers and provided them to all CNS students free of charge.
3. CNS Slack Workspace - which was implemented to encourage information sharing between students and for the organization of organic in-person events.
4. SLC Town Hall - CNS students shared updates and voiced their concerns in a supportive and confidential setting.
5. CNS clothing order - the order form was distributed to students, faculty, and staff, and to date, we have 30+ orders.
6. Grad Club trivia - CNS students were encouraged to gather at the Grad Club for Thursday trivia night.

To build on this momentum, the SLC has the following goals for next year:

1. We are working with the EDII committee, Graduate Committee, and CNS admin to offer new students an orientation in the fall to promote a feeling of inclusivity for all students.
2. We are working with CNS admin to deliver an exciting Neuroscience Research Day in the fall.
3. We will continue to build student engagement on the Slack channel to bridge the divide between individual labs.
4. We will create better communication channels for student representatives on CNS committees.

We look forward to bringing these goals to fruition!

Sincerely,

The SLC

Emils Matiss (Lead)

Landon Montag (Secretary)

Tasha Jawa

Isabelle Mastantuono

Parsa Balalaie (International and EDII representative)

Colleen Fleury

Marion Lazaj (First-year representative)

Aaron Philipp-Muller (liaison to the Graduate Coordinator)

Scott Squires

OUR STUDENT LEADERSHIP TEAM



Parsa Balalaie
STUDENT LEADERSHIP
COMMITTEE



**Alexander
Bambokian**
MR MANAGEMENT
COMMITTEE



**Aleksandar
Biorac**
SEMINAR COMMITTEE



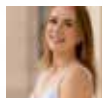
Tina Chalhoub
EXECUTIVE COMMITTEE



Sydney Dore
SEMINAR COMMITTEE



Colleen Fleury
STUDENT LEADERSHIP
COMMITTEE



**Dominique
Hancock**
FUNDRAISING COMMITTEE,
GRADUATE COMMITTEE



Jasleen Jagayat
SEMINAR COMMITTEE,
RESEARCH COMMITTEE



Tasha Jawa
STUDENT LEADERSHIP
COMMITTEE



Edwin Kiarie
EDIAA COMMITTEE



Marion Lazaj
STUDENT LEADERSHIP
COMMITTEE, SEMINAR
COMMITTEE



**Isabelle
Mastantuono**
STUDENT LEADERSHIP
COMMITTEE



Emils Matiss
STUDENT LEADERSHIP
COMMITTEE, EXECUTIVE
EDUCATION COMMITTEE,
EDIAA COMMITTEE



**Kathryn
McIntosh**
EDIAA COMMITTEE



**Alexandra
McLaren**
SAFETY COMMITTEE



Landon Montag
STUDENT LEADERSHIP
COMMITTEE



**Aaron
Philipp-Muller**
STUDENT LEADERSHIP
COMMITTEE



Blake Noyes
EDIAA COMMITTEE



Scott Squires
STUDENT LEADERSHIP
COMMITTEE

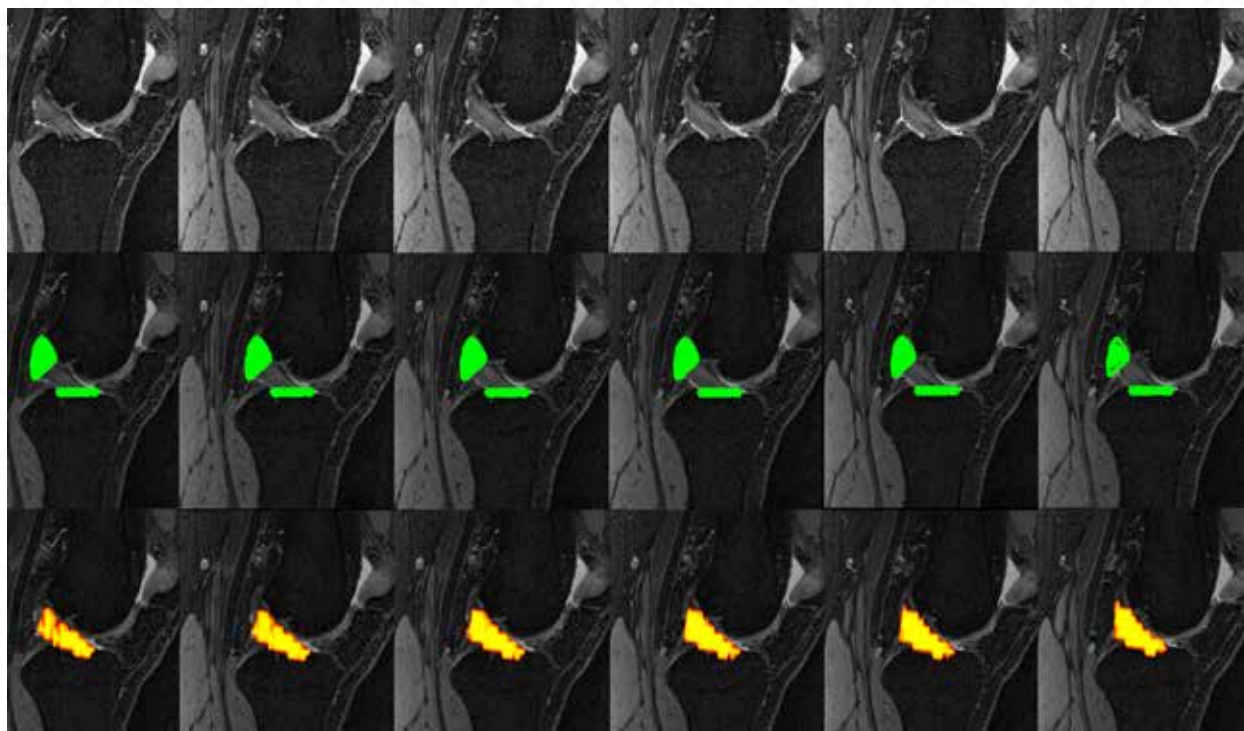


MR FACILITY

MORE THAN BRAINS

Despite the ongoing challenges of COVID on the CNS MRI Facility, cutting edge research continued throughout the year. At the CNS MRI Facility, our primary focus is on the brain and spinal cord but our 3T Prisma Fit is fully capable of whole body scanning and research and we have a wide variety of coils and sequences to support such endeavors. As one example, Dr. Allen Champagne (MD, PhD and recent graduate of the CNS) recently conducted a study of multiband diffusion tensor imaging (DTI) in the knee..

Using many of the same techniques as we would use to study the white matter tracts of the brain, Allen used high-resolution DTI to reconstruct the anterior cruciate ligaments (ACL) of both knees and assess their structural integrity. We used our flexible body coil and spine coil to image the knee and vacuum-sealed positioning bags for stabilization. The goal of this research was to find reference biomarkers for ACL integrity that could be used to assess post-operative recovery after ACL reconstruction surgery. Allen was able to demonstrate that DTI could indeed supplement current clinical care in this area, potentially improving the return to normal activity for these patients.



Expanding our research opportunities to orthopedics was a fascinating and exciting project. The CNS MR Facility was able to support this research through our Pilot Time Competition, which provided a reduced scanning rate to promote the collection of pilot data. Watch our social media and website this year for the announcement of the next round of the competition. If you have an interesting research question that MRI could help answer, this is an excellent opportunity to explore MR research at a much reduced cost.

Sagittal views of the knee highlighting the anterior cruciate ligament (ACL) computed using probabilistic tractography. Regions of interest were defined (green) and the resulting tractography reconstruction of the ACL is displayed in yellow-red.



NETWORKING INFRASTRUCTURE

The past two years have presented many challenges in supporting the computing infrastructure. User support has increased as we endeavour to stay abreast of user issues as we juggle this new hybrid work model. We were able to increase support by hiring an undergraduate student from Toronto Metropolitan University, Jacob Belmont, for a four month period which has been most beneficial. As Queen's University has seen an increase in the number of cyber-attacks on campus, we have been implementing new and stronger

security for our systems and networks. The IT unit continues to upgrade computer desktops, laptops and server operating systems as needed. The latest server edition will ensure our systems are updated and patched until April of 2025.

Networking Infrastructure includes:

- 30 IBM, Dell, and Lenovo servers
- 450 terabytes of combined data storage
- 420 cpu cores
- 3 terabytes ram
- 4 Robotic LTO tapes libraries for local and offsite backup
- Hosted in an environmentally and access controlled location

FUNDRAISING

The Fundraising Committee takes on a leadership role for planning and coordinating strategies that give to our donors the possibility to make the difference in the lives of those living with brain diseases and foster and develop our relations with industry. Our donors' generous gifts support CNS activities in different levels, from infrastructure to the scholarships that make our students development as neuroscientists a reality. This committee is chaired by Dr. Elisa Brietzke MD, PhD, Professor of the Department of Psychiatry, and includes CNS faculty members, students and representatives from Faculty of Health Sciences and Faculty of Arts Science involved in Development and Partnerships. The main actions of the committee for the next few years are strengthening the connection of CNS with its alumni, integrate fundraising activities to the research themes, and integrate CNS fundraising activities with the opportunities already available at Queen's University.

EQUITY, DIVERSITY, INCLUSION, INDIGENEITY & ACCESSIBILITY

The EDIIA Committee was created in the Spring of 2021 to ensure that EDIIA best practices are implemented and adopted by the Centre for Neuroscience Studies (CNS). Identification of EDIIA best practices has and will continue to be informed by the recent and ongoing work of the Dean's Action Table on EDI, in the Faculty of Health Sciences, the Equity office at Queen's, the work and discussions of the CNS Anti-Racism Taskforce, and other external resources as appropriate. Membership of this committee includes representatives of CNS graduate students, staff and faculty. The 2021-2022 committee is co-led by Blake Noyes (Graduate Student Co-Lead) and Vince DePaul PT PhD (Faculty Co-lead). Over the past year, the committee engaged with trainee, staff, and faculty within CNS to identify EDII strengths and areas of concern regarding current processes, structures and practices. As a result, the EDII committee created the Room of Requirement, a private room at the CNS where individuals can de-stress, pray, or meditate, organized relevant training sessions for students, and hosted a casual seminar for students to discuss EDII-related issues in neuroscience. In addition, the committee advised on various initiatives at the CNS, including orientation activities and the creation of a new Black and Indigenous student bursary. We look forward to working to ensure that the CNS is an equitable, diverse, inclusive, and accessible research and training centre, where excellence is enhanced by the contributions of all its members.

Contacts: Vince DePaul PT PhD (vincent.depaul@queensu.ca); Blake Noyes (blake.noyes@queensu.ca)

EXECUTIVE EDUCATION PROGRAMS

EXECUTIVE EDUCATION COMMITTEE OBJECTIVES

1. To translate evidence-based neuroscientific knowledge to relevant sectors of society
2. To develop certificate and graduate diploma programs in Technology and Ethics in Neuroscience.
3. To provide a sustainable revenue generating stream for the Centre for Neuroscience Studies

PROGRESS AND SUCCESS

We held a successful conference - “A Neurotech Future: Ethical, Legal and Policy Issues” in April, 2021. One of the primary outputs was to “Develop educational programs to train the next generation of Neurotech innovators”. To this end, we successfully obtained funding from the Province of Ontario Microcredential Challenge Fund (\$300,000) to create a core set of online microcredentials on topics of relevance to the NeuroTech Industry, to be launched in the 2022/23 academic year.

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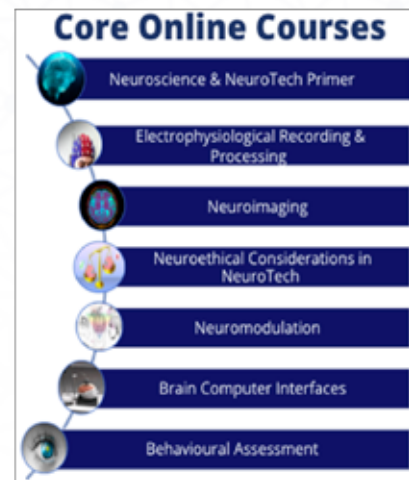
Engineers and computer scientists have the hard skills required to innovate in the Neurotech field, but often lack the foundational neuroscience knowledge; with the reverse being true for biomedical and social science students. Most groups of learners know little about neuroethical and regulatory frameworks. Our aim is to address these gaps by developing a suite of microcredentials to prepare students to transition to the neurotechnology industry and/or help people in the workforce upscale their skills to do so.

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The CNS is collaborating with NeuroTechX (the leading global non-profit supporting neurotechnology enthusiasts) to develop core microcredential courses that learners around the world will be able to enroll in. To ensure that our courses are relevant to industry, we have partnered with several companies that are currently innovating in the neurotech field to create an Industry Advisory Board. Members of this board are providing feedback on course content during the development phase.

In addition to the online courses, the Queen's CNS will host an experiential 'in-person' Capstone Project Course. For the Capstone, learners that have completed our series of microcredentials will be able to come to Queen's CNS to explore our neurotechnology facilities, have hands-on experience with neurotechnologies, and complete a Capstone project in small groups. This project will involve solving a problem that is relevant to industry and may lead to possible internships at NeuroTech companies. To expand the program and increase geographic outreach of the Capstone course, we obtained a "Community Impact Award" (\$975,000). To do this we are partnering with the Western University, York University, and Nipissing University and plan to deliver in-person Capstone courses for learners at these sites in addition to Queen's. With this funding we will also develop additional microcredentials on topics such as Neuro-entrepreneurship, Neuro-marketing, Neurological Assessment, and Neuro-law.



NEUROSCIENCE

LECTURE SERIES

The student-led Seminar Committee works with trainees and faculty to highlight speakers that represent the diverse research interests of our centre.

The series features renowned international and Queen's researchers at the frontiers of basic, clinical, systems and computational neuroscience. The series includes a subsection of talks termed "Growing up in Science" geared towards trainees which creates a dialogue about the personal challenges related to becoming a successful scientist. The series also demonstrates leadership and social progress in neuroscience by shining a spotlight on issues such as women's advancement in science and engineering and the open science movement.

Despite the challenges presented during the Covid pandemic this year, this Committee managed to keep the Seminar Series running smoothly by moving all of the talks online, each and every week. People from around the world were able to take part and all of the speakers were very receptive to presenting virtually.

We hosted a total of 33 speakers (16 females & 17 males): 4 growing up in science (GUIS) talks, and 29 academic talks.

LIST OF SPEAKERS FOR 2021 / 22

May 5 2021

AMY BASTIEN - Johns Hopkins School of Medicine

Academic talk: *Learning and Relearning Movement*

May 12 2021

WARREN JONES - Emory University School of Medicine

Academic talk: *Using social visual engagement to quantify the emergence of autism in infancy*

May 19 2021

FREDA MILLER - University of British Columbia

Growing Up in Science talk

May 26 2021

MARCELO DIETRICH - Yale School of Medicine

Academic talk: *The origins of homeostatic sensing*

June 2 2021

ANITA TUSCHE - Queen's University

Academic talk: *Understanding others: how social cognition changes social behavior and social functioning*

June 16 2021

SCOTT MURDISON - Facebook

Growing Up in Science talk

June 23 2021

MICHAEL J FRANK - Brown University

Academic Talk: *Linking levels of analysis from brain to behavior in computational modelling*

June 30 2021

SARI VAN ANDERS - Queen's University

Academic talk: *Gender / sex diversity: from lived experiences to the biosciences*

September 8 2021

BEN THOMPSON - University of Waterloo

Academic talk: *Harnessing visual cortex plasticity to recover vision*

September 15 2021

ADELE DIAMOND - University of British Columbia

Academic talk: *Some implications of unusual properties of the dopamine system in prefrontal cortex for stress vulnerability and treatment of ADHD*

September 22 2021

GREGERS WEGENER - Aarhus University

Academic talk: *Brain plasticity and behavior in depression and recovery*

September 29 2021

NAFISSA ISMAIL - University of Ottawa

Academic talk: *The gut microbiome: a mediator of stress induced depression and anxiety in males and females*

October 20 2021

TIMOTHY BREDY - Queensland Brain Institute

Academic talk: *Long non-coding RNAs and memory*

October 27 2021

IRIS BALODIS - Macmaster U

Academic talk: *The Neurobiology of Motivation in Cannabis Use Disorder*

November 3 2021

JENNIFER CHANDLER - University of Ottawa

Academic talk: *Mapping Fundamental human interests in neuroprostheses: a first step in responding to intelligent neurotechnology*

November 10 2021

GORDON BOYD - Queen's University

Growing Up in Science talk

November 17 2021

TSUNEYA IKEZU - Mayo Clinic

Academic talk: *Extracellular vesicles and Alzheimer's disease*

November 24 2021

JOHN CRYAN - University College Cork

Academic talk: *Gut feelings: the microbiome as a key regulator of brain and behavior across the lifespan*

November 29 2021

FERNANDA TOVAR-MOLL - IDOR

Academic talk: *Functional and structural brain connectivity and plasticity*

December 8 2021

VALERIE TAYLOR - University of Calgary

Academic Talk: *The gut microbiome in mental illness: Hope or Hype*

December 09 2022

JIBRAN KHOKHAR - University of Guelph

Academic talk: *Substance Use and Schizophrenia: Cracking the Chicken-or-Egg Problem*

December 16 2022

CAROLINE MENARD - Université Laval

Academic talk: *The biology of stress and mood disorders: a multidisciplinary and whole-body approach*

March 09 2022

STEPHEN SCOTT - Queen's University

Academic talk: *Neural basis of voluntary control: skill through rapid feedback processing*

March 30 2022

NAFISA JADAVJI - Carleton University

Academic talk: *Does nutrition impact ischemic stroke outcome?*

Understanding the role of dietary vitamin B12 deficiencies in adult and aged female mice

April 06 2022

BEATRIZ LUNA - University of Pittsburgh

Academic talk: *Specialization of brain mechanism in adolescence that support adult neurocognitive trajectories*

April 13 2022

RON LEVY - Queen's University

Academic talk: *Deep brain stimulation at Kingston Health Science Centre*

April 20 2022

GUNNAR BLOHM - Queen's University

Academic talk: *Saccade pursuit eye movement interactions*

April 27 2022

MIRIAM SPERING - University of British Columbia

Growing Up in Science Talk



NEUROSCIENCE OUTREACH PROGRAM

The Neuroscience Outreach Program (NOP) in the Centre for Neuroscience Studies (CNS) took a hiatus during the COVID pandemic due to limitations in being out in the community. Earlier this year we ran a search for our new student leads and are thrilled to announce Scott Squires and Theo Aliyanis as our new student representatives for the program. They are joined by staff member, Kim Suffron as the staff representative. New outreach programs are on the horizon, such as a new Podcast series being implement by PhD candidate, Elena Koning.

PROGRAMS

Beads of Purpose

Beads of Purpose (BOP) is a social enterprise that aims to aid adults with developmental delays to develop skills that will guide their involvement in employment rolls. The objective was to develop a team of volunteers and participants to create and sell homemade bracelets.

Brain Awareness Day

Every May, the Centre for Neuroscience Studies plays host to approximately 250 grade 5 students from local elementary schools. The students enjoy a daylong event where they are engaged in demonstrations, activities, and hands-on experiments to teach them all about neuroscience research.

Brain Badge

Teaching young children all about the brain is extremely rewarding! The Brain Badge program is a workshop for Sparks, Scouts, Brownies, Beavers, and Cubs (age 2-15 years old) in the Kingston and greater Kingston area.

Brain Bee

The Brain Bee is a three-tiered, world-renowned competition for future neuroscientists. The Centre for Neuroscience Studies has hosted the Kingston Brain Bee for the past eleven years. This competition for high school students aims to inspire an interest in neuroscience and brain research, as well as provides students with an enrichment opportunity to learn about concepts not typically taught until the third year of university or beyond.

PROGRAMS

Brain Reach

Brain Reach is a graduate student initiative created to stimulate learning and curiosity-driven education. Once a month, dedicated volunteers from Queen's University will go to the classroom to lead sessions on different aspects of the brain's mysterious machinery.

Brain Storm Speaker Series

Each month from January through June students from Queen's Centre for Neuroscience Studies talk about their research. These series are hosted in collaboration with the Kingston Frontenac Public Library.

Child and Adolescent Psychiatry Program

The Child & Adolescent Psychiatry Program currently consists of graduate students from the Centre for Neuroscience Studies who visit the child and adolescent inpatient unit at Kingston General Hospital. The goal of our program is to encourage health and well-being, so we often focus on activities that are relaxing or beneficial to mental health.

Policy and Neuroscience Society (PNS)

The Policy and Neuroscience Society is a group of graduate students providing public science communication and advocating for evidence based public policy. Our goal is to improve public scientific literacy by developing clear and accessible resources.

PROGRAMS

Research and Information Science Education (RISE)

RISE is a diverse group of student volunteers working towards the common goal of providing critical thinking and science education to children grades 6-8. The volunteers are classroom educators who go into classrooms to provide education sessions on science and research skills. The volunteers have bi-weekly meetings, and each educator does 4 classroom sessions.


Science Rendezvous

Science Rendezvous is a national family-oriented event that showcases the scientific research taking place across Canada hosted by the Faculty of Education at Queen's University. The event is free to the public and families can come to learn about research in science, technology, and engineering, talk to scientists about their work, and take part in fun experiments and activities.

Social Club

The Social Club is a unique program where volunteers come together to give back to the Kingston Community by engaging patients and residents at long-term care facilities (Providence Care Kingston) with various crafts and activities.





centre for neuroscience studies

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