Message from the Director

Vision/Mission/Priorities

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Meet Our Administrative Team

Meet Our Research Team

Meet Our Postdoctoral Fellows

Establishing Research Themes

Research Outcomes

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MRI Facility Impact

Executive Education Programs

Neuroscience Lecture Series

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Dear Colleagues, Students, Staff and Friends!

This is my second yearly report to you, and I am very excited to report another year of success and further advancement of the Centre. During my second year I have had the opportunity to work and interact with many of you on administrative or student committees. It has been an extremely busy, exciting and difficult year for all of us. As we think back to our retreat in the summer of 2018, we identified an ambitious set of priorities and action plans to accomplish under the new directorship of the Centre.

“I am very proud to report that we have successfully accomplished virtually all working directives set out.”

One of the major highlights of the year was the upgrade of our MRI system to the state of the art PRISMA model. We are grateful to the Offices of VP Research, the Faculty of Health Sciences and the Faculty of Arts and Science for their continued support in facilitating the purchase of the PRISMA upgrade to our 3T MR System. I am happy to report that our new system is producing remarkable data for our imaging studies on both human and animal models. We are also launching new innovative ways of increasing the use of this new state-of-art scanner.

The number of new faculty members of the Centre has continued to grow and is now exceeding 85 members. In addition to the increased membership, engagement of the members has also grown significantly. This increased engagement has been crucial to Centre’s success at setting and meeting our working directives.

Our graduate training program continues to thrive and exceed our expectations. To date, we have successfully graduated 242 students. We had an exceptional year in recruitment of new student numbers with an enrollment of 18 new MSc and 11 new PhD students for the 2019 academic year. This is the largest intake for the program since its inception which brought our 2019 graduate enrollment numbers to 33 MSc and 48 PhD. This year we saw many new initiatives launched under the umbrella of the Neuroscience Graduate program including the launch of NSCI 801 and the development of a Graduate Research Fellowship (GRF) Professional Development Plan. We look forward to creating an Industry Certificate Program for PhD candidates in 2020/21.

Our research productivity has also increased, with five successful NSERC and 3 successful CIHR grants in the 2019 competitions. We were also extremely successful in obtaining research contracts during 2019 that combined total over $7M. Members of the Centre published over 540 papers in refereed journals throughout 2019 representing an enormous amount of research productivity.

It goes without saying that the unexpected COVID-19 pandemic impact on society, Queen’s University and the Centre itself has been immeasurable. I would like to take a moment to connect with all of you during this unusual and difficult time. The shut down of the University has certainly created a time of anxiety for many faculty, staff and trainees. Unfortunately, as a result of the pandemic we have not been able to finalize our research themes and priorities but I am confident that we can continue the process in the near future. I am happy to say that the focus for the Centre has been to ensure the health and wellbeing of staff and trainees during the pandemic. At the same time, we have been engaged in planning for the gradual restarting of our research and educational missions.

I would like to take this opportunity to thank all staff, faculty and trainees for their continued hard work and dedication to neuroscience at Queen’s during the year. I wish you all a successful year ahead.

Roumen Milev, MD, PhD, FRCPsych, FRCPC
Professor of Psychiatry and Psychology
Director, Centre for Neuroscience Studies
VISION

The CNS is internationally recognized for groundbreaking 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
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
LEAD SEMINAR SERIES
Doug Munoz

LEAD MR FACILITY
Jason Gallivan
(Effective July 2020)

LEAD EXECUTIVE EDUCATION
Susan Boehnke

LEAD STUDENT LEADERSHIP
Kathleen Harrison
Kaitlyn Tresidder

THME 3
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.

**Muhammad Ayub**  
Professor  
Psychiatry  
**Research Interest:**  
His research interests are diverse and include genetics of developmental disorders, genetics of psychiatric disorders and adaptation of cognitive behavior therapy for non-Western cultures and for individuals with developmental disabilities.

**Martha Bailey**  
Professor  
FACULTY OF LAW, CENTRE FOR NEUROSCIENCE STUDIES  
**Research Interest:**  
Dr. Bailey’s research interest are in Neuroscience and the Law.

**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.

**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.
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.

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.

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.

Dr. Bonger’s 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.

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.

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

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 Castelhano
ASSOCIATE PROFESSOR
PSYCHOLOGY

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.

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.

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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.

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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.

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Hans Dringenberg  
**PROFESSOR**  
**PSYCHOLOGY**

**RESEARCH INTEREST:**  
Dr. Dringenberg 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.

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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.

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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.

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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.
MEET OUR FACULTY

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, FRCPC)
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.

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. Michael Hendry has a focus on emotional development across the adolescent transition to understand how emotion regulation improves, how appraisals, autonomic arousal, and expressions cohere during an emotional episode, and how socioemotional flexibility relates to psychopathology.

Tom Hollenstein  
ASSOCIATE PROFESSOR  
PSYCHOLOGY

RESEARCH INTEREST:  
Dr. Tom Hollenstein’s research is in emotional development across the adolescent transition to understand how emotion regulation improves, how appraisals, autonomic arousal, and expressions cohere during an emotional episode, and how socioemotional flexibility relates to psychopathology.

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

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.

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).

Kevin Munhall
PROFESSOR
PSYCHOLOGY

RESEARCH INTEREST:
Dr. Munhall’s research focuses on spoken language. On the perception side, they study multi-sensory speech perception and how vision improves intelligibility under adverse listening conditions. In speech production, their research has recently addressed sensorimotor control of articulation. In particular, they have studied how auditory feedback is used while talking. Their other line of research is face-to-face conversation. This is our most common form of communication and it includes both the processing of speech input and speech output in real time.

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.

Cella 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
BIOMEDICAL AND MOLECULAR SCIENCES

RESEARCH INTEREST:
Dr. Paré’s research aims to understand the development of sensory-motor control in both typical child development and in selected paediatric clinical populations. Visuall-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.

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.

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.
MEET OUR FACULTY

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 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. Reynolds’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.

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.

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.

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.

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.

Taras Reshetuka
ASSISTANT PROFESSOR
PSYCHIATRY

RESEARCH INTEREST:
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ASSISTANT PROFESSOR
PSYCHIATRY

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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.

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.

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.

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.

Jeremy Stewart
ASSISTANT PROFESSOR
PSYCHOLOGY

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.

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.
MEET OUR FACULTY

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.

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-gangliosidoses (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.

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.

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
DEPARTMENTAL AND FINANCIAL ASSISTANT
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

Catherine Crandell
RESEARCH ASSISTANT

RESEARCH RESPONSIBILITIES:
Assist with animal training, care and procedures.

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.

Heather Hink
CLINICAL RESEARCH MANAGER, ONTARIO NEURODEGENERATIVE RESEARCH INITIATIVE

RESEARCH RESPONSIBILITIES:
Provide project management support with regards to new initiatives. Assist with writing of new study protocols, consent processes and ethics submissions, clinical site training and clinical data curation.

Brittney Armitage-Brown
RESEARCH ASSISTANT

RESEARCH RESPONSIBILITIES:
Coordinate and implement research protocols as well as oversee student, monitor and evaluate research models. Organize and maintain records on research models.

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 neurodevelopment & neurodegeneration (Coe et al., 2017).

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.

Ann Lablans
RESEARCH ASSOCIATE

RESEARCH RESPONSIBILITIES:
Manages all aspects of Munoz laboratories with specialization in human and animal ethics protocols, research policies and procedures.
Catherine Lowrey  
RESEARCH ASSOCIATE

RESEARCH RESPONSIBILITIES:  
Catherine conceptualizes tasks to assess sensorimotor ability in patient populations using the KINARM robot. She analyzes the data collected from patient groups as well as healthy control participants to understand impairments in ability caused by neurological disease, (primarily Stroke).

Sean Lucas  
FINANCIAL OFFICER

RESEARCH RESPONSIBILITIES:  
Provide budgeting and reporting oversight and support for the Ontario Neurodegenerative Disease Research Initiative (ONDRI). This is a multiple platform longitudinal study out of 15 Clinical, academic and research centres across Ontario funded by the Ontario Brain Institute.

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.

Lisa Potter  
MEDICAL RADIATION TECHNOLOGIST—MRI

RESEARCH RESPONSIBILITIES:  
Lisa joined the CNS MRI Facility team this year and will be running imaging studies part time and after hours. We are excited to add her knowledge as a registered MRT to the new facility.

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

Ying Chen  
PHD: YORK UNIVERSITY, TORONTO, ONTARIO  
Currently working with Dr. Doug Munoz  
RESEARCH INTEREST:  
Ying’s research focuses on identifying biomarkers for speed of processing deficits in neurodegenerative diseases as well as investigating the deteriorated neural circuitry for saccade control by combining eye tracking data with data from other platforms within Ontario Neurodegenerative Disease Research Initiative (ONDRI).

Natalia de M. Lyra E Silva  
PHD: FEDERAL UNIVERSITY OF RIO DE JANEIRO  
Currently working with Dr.s Doug Munoz and Fernanda de Felice  
RESEARCH INTEREST:  
Natalia is interested in understanding the molecular alterations underlying brain diseases, with focus on Alzheimer’s disease and the mechanisms of crosstalk between the brain and the periphery.

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.

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.

Emily Hawken  
PHD: QUEEN’S UNIVERSITY, ONTARIO  
Currently working with Dr. Muhammad Ayub  
RESEARCH INTERESTS:  
Emily is a cellular and molecular electrophysiologist, with extensive research training in behavioral and clinical neuroscience. Her research interests are in identifying neural and genetic substrates of behaviors to better understand the origins of psychiatric neuropathologies.
Shoko Kasuga  
**PHD: THE UNIVERSITY OF TOKYO, JAPAN**  
Currently working with Dr. Stephen Scott  
RESEARCH INTEREST:  
Shoko is interested in how the human brain integrates multiple sources of sensory information to guide motor actions.

Joseph Nashed  
**PHD: QUEEN'S UNIVERSITY, ONTARIO**  
Currently working with Dr. D.J. Cook  
RESEARCH INTEREST:  
Joseph's research interests include motor control, neurophysiology, neuroimaging and non-human primate models of disease. His current research focuses on understanding, and facilitating, the neural substrates that mediate recovery following middle cerebral artery occlusion.

Chloé Cydalise Nobis  
**PHD: UNIVERSITY OF MONTREAL, QUEBEC**  
Currently working with Dr. Nader Ghasemlou  
RESEARCH INTEREST:  
Chloe is interested in understanding the contribution of circadian clocks in the immune response. Her current research project is about the circadian control of pain in naive animal and in a mouse model of chronic pain (spared nerve injury).

Jaqueline Raymondi Silva  
**PHD: UNIVERSITY OF SÃO PAULO, BRAZIL**  
Currently working with Dr. Nader Ghasemlou  
RESEARCH INTEREST:  
Jacqueline's research is in neuroimmunology, pain, inflammation, behavioural analyses.

Calvin P Sjaarda  
**PHD: BROCK UNIVERSITY, ONTARIO**  
Currently working at the Queen’s Genomics Lab at Ongwanada (Q-GLO)  
RESEARCH INTERESTS:  
Calvin’s research interests are in the identification and characterization of genetic, epigenetic, and environmental factors underlying complex neurodevelopmental disorders, including ASD and ADHD, and neuropsychiatric disorders.

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).
The Centre for Neuroscience Studies is in the process of identifying research themes that represent major strengths and opportunities for the CNS in order to guide and support future training, growth and development. There are several reasons why the centre is completing this process:

1. A primary function of the Centre for Neuroscience Studies is to provide a mechanism for members of our scientific community -- who are housed across various departments at Queen’s -- to interact and collaborate on issues that are of cross-disciplinary interest and importance. Identifying research themes will help members to see the specific ways in which they might be able to realize this primary benefit of the centre for their own scientific growth and development.

2. Tri-council funding, especially CIHR, has become more competitive and single-PI grants are less likely to be funded than grants that bring a skilled team with diverse expertise together to tackle an interesting challenge. Identifying research groups provides one way of linking members of the CNS to start discussions about possible avenues for collaboration and creating teams that can be successful in this changing environment.
3. Many funding opportunities, including large infrastructure grants like CFI as well as training grants, require research groups with a critical mass of researchers that are recognized at the national or international level.

4. Growing our program and bolstering our national (and international) reputation rests on our ability to attract high achieving faculty, as well as trainees who ultimately go on to be successful in the field. Identifying a handful of research themes, and then advertising them, provides a way of showcasing our strengths, and that we offer a training and research environment that is both rigorous with respect to scientific standards and diverse with respect to methodology and perspective.

The first phase of our process was the creation of a Research Theme Selection Committee to develop and guide the selection of research themes and ensure membership on this committee includes CNS members reflecting a diversity of departmental and faculty affiliations and seniority. The committee was formed in the summer of 2019 and is led by Dr. S. Scott (DBMS and Medicine) and includes Drs. S. Ameri (Electrical and Computer Engineering), M. Ayub (Psychiatry), G. Blohm (DBMS, Psychology, Mathematics & Statistics and School of Computing), S. Crocker (Pathology and Molecular Medicine), M. Sabbagh (Psychology) and Ms. K. Suffron (CNS). The committee developed guidelines for the process including a list of criteria to assess potential research themes and a list of activities and responsibilities for each selected theme. The second phase occurred in the Fall of 2019 and involved a survey to collect data on the research programs of CNS members. This information included recent research funding, including tri-council funding, as well as measures of research output including the journal publications and citation rates by CNS members. Phase 3 occurred in the Winter of 2020 and used the collected data to identify 5 potential research themes that appeared to maximally capture the research interests of CNS members. The committee has now sent out a survey to get feedback from all CNS members related to these 5 research themes, specifically to self-identify whether and how their research programs fit with any of these research themes and to identify other possible research themes. The final phase will be completed this summer at a Neuroscience Research Retreat that will provide an open interactive process for all CNS members to discuss and develop the final selection of our research themes.
Refereed Journal Articles
In 2019 faculty members from the Centre for Neuroscience Studies published 544 refereed journal articles.
Being a graduate student in the CNS has provided me with unique resources, opportunities, and collaborations that I wouldn’t have been able to get elsewhere and have really helped me to advance my degree. And there is always someone there to help along the way!”

Caroline Wallace, PhD candidate
DIVERSITY OF RESEARCH

The CNS graduate program is devoted to training the next generation of neuroscience leaders for academia, government and industry. To ensure its future success in times of challenging academic environments, a fast-paced private sector, and global societal changes, we envision a graduate program with enhanced transferable skills training and outreach opportunities. We will also further expand our course offerings to reflect emerging fields in neuroscience and the ever growing need for bleeding-edge quantitative skills. Cross-fertilization to other areas will provide exciting opportunities for the neuroscience program, such as in the development of neuromarketing, neuroethics, and industry certificates. All these initiatives will further underline our graduate program’s emphasis on all aspects of career development and training, from knowledge acquisition to the development of skills in data analytics, scientific communication and project management. Our goals is to be a leader in neuroscience research and training with interdisciplinary faculty specialized in basic, translational and clinical neuroscience.

“I would like to say that I feel very grateful for the project I am working on and supported by the various resources that the program and the university offer to students. Been an international student and having to practice your professional skills in an unfamiliar world might be a challenging experience at the beginning but I have got help from the administrators, my supervisor, my colleagues and the wide various resources offered specifically for international students. I appreciate that everyone is happy to give you a hand and the amazing team spirit around.

Alba Chavez Ramos, PhD candidate
STUDENT ENGAGEMENT

The Centre for Neuroscience Studies has devoted considerable effort into student engagement through many different avenues. We are very proud of our Student Leadership Committee (SLC). This group of students meets on a monthly basis to address student concerns and bring these concerns forward through the appropriate channels. Through recommendations of the SLC, survey results, feedback forms and general open conversations with our student population we have also launched the following student engagement initiatives: periodic student meetings with the Graduate Coordinator and Director of the Centre, semi-annual student retreats, graduate student representation on committees, invitations to all faculty retreats. Because of the valuable feedback of our students we have been able to successfully meet many of their requests such as the updating our student handbook, the creation of an MR training program, launching of new neuroscience courses (some of which are under development) and the creation of an Industry Certificate program which is also currently under development. We are fortunate to have such a committed and dedicated group of graduate students who are so instrumental in guiding the future direction of the Centre. We will continue these important efforts and explore new avenues for engaging our students.
MEET OUR PhD STUDENTS

Amal Abdullah Abuomar ................................. Lomax Lab
Parisa Abedi Khoozani ................................. Blohm Lab
Hanin Alsaadi ................................................ Kawaja Lab
Rafaela Araujo Goncalves de Silva ............... Munoz/De Felice Lab
Aleks Biorac .................................................... Vazquez Lab
Brandon Caie .................................................... Blohm Lab
Olivia Calancie .............................................. Khalid Khan/Munoz Lab
Jonathan Coutinho .................................... Blohm Lab
Kevin Cross ...................................................... Scott Lab
Benjamin Cuthbert ...................................... Blohm Lab
Guilherme de Freitas ................................. Munoz/DeFelice Lab
Natalie Deschenes ................................... Walia Lab
Siavash Eftekharifar ................................. Troje Lab
Ashleigh Forsyth ........................................ Groll Lab
Pauline Gaprielian .................................... Levy Lab
Daniel Gale ................................................ Gallivan/Flanagan Lab
Kathleen Harrison .................................... Cook Lab
Po (Jeff) Huang ........................................... Munoz Lab
Gabriela Ioachim ....................................... Stroman Lab
Janis Kan ..................................................... Munoz Lab
Jasmine Khan ............................................. Boyd Lab
Ryan Kirkpatrick ................................... Khalid Khan/Munoz Lab
Mavis Kusi .................................................. Pare Lab
Matthew Laporte ......................................... Blohm Lab
Angela Luedke .............................................. Munoz Lab

Chloe Lowry ................................................ Andrew/Bennett Lab
Michael McGarity-Shipley ......................... Gallivan Lab
Kathryn Mcintosh ...................................... Levy Lab
Theresa McIver ........................................ Craig Lab
Joshua Moskowitz ................................ Flanagan Lab
Samira Osman ......................................... Munoz Lab
Kayne Park ................................................ Scott Lab
Julia Perkins ................................................ Munoz Lab
Jocelyn Powers .......................................... Stroman Lab
Heidi Riek ...................................................... Munoz Lab
Alba Ramos Chavez ................................ Reynolds Lab
Scott Robson ............................................. Kuhlmier Lab
Nazneen Rustom ...................................... Iftene Lab
Joanna Semrau ......................................... Boyd Lab
Leif Simmatis ........................................ Scott Lab
Chloe Soutar ........................................ Dringenberg Lab
Scott Squires .......................................... Milev/Poppenk
Ayssar Tashtush ...................................... Lomax Lab
Kaitlyn Tresidder ...................................... Bennett
Christopher Trimmer ............................. Naeem Lab
Jessica Vanderlinden ............................. Boyd Lab
Caroline Wallace ................................... Milev Lab
Rachel Yep ................................................ Munoz Lab
MEET OUR

MSc STUDENTS

Bailey Brant ..............................................................Blennerhassett Lab
Arthi Chinna Meyyappan ...............................Milev Lab
Emily Collis ...............................................................Reynolds Lab
Sydney Dore ...........................................................Blohm Lab
Spencer Finn ...........................................................Winston Lab
Evan Forth ..............................................................Milev Lab
Joshua Gambier ....................................................Gallivan Lab
Deirdra Hindmarch .............................................Walia Lab
Jorge Ingles-Gonzalez ...........................................Blohm Lab
Nazgol Kafaei Shahbaz .....................................Walia Lab
Jeong (Melody) Kang .............................................Vazquez Lab
Jay Kataria ...............................................................Blennerhassett Lab
Kristen Lacelle .......................................................Cook Lab
Kelly Lee ..............................................................Andrew Lab
Bernie Longange_Kingiela ..........................Kawaja Lab
Blaire Magee ............................................................Cook Lab

Abby McDonell .....................................................Lomax Lab
Blake Noyes ........................................................ Khalid Khan Lab
Jacob Peller ......................................................... Kawaja Lab
Emile Peponoulas ................................................. Cook Lab
Karys Peterson-Katz ........................................... Reynolds Lab
Ashley Ptinis ..........................................................Cook LB
Brianna Quinville ................................................ Walia Lab
Mohamed Rahal ................................................ Walia Lab
Emma Robertson ................................................. Munoz Lab
Alexandra Ryckman ........................................ Walia Lab
Kaden Shearer ..................................................... Cook Lab
Tishani Sritharan ................................................ Milev Lab
Pranavan Thirunavukkarasu ........................ Pare Lab
Howard Warren ................................................... Stroman Lab
Troy Webster ......................................................... Walia Lab
Olivia Calancie (PhD)
– ONTARIO GRADUATE SCHOLARSHIP

Olivia Calancie is a PhD student studying response inhibition and temporal prediction across healthy development and in neuropsychiatric disease. Using cognitive tasks, eye-tracking, and neuroimaging, she investigates circuit-based neural deficits, as evidenced by behavioural performance, saccadic metrics, pupillary responses, and large-scale neural network activity, in adolescents showing early signs of psychiatric illness (e.g. Borderline Personality Disorder; Post-traumatic Stress Disorder). Ultimately, she hopes that this research will contribute to the larger scientific initiative of providing a more mechanistically and neurobiologically oriented approach to identify and treat psychiatric disease among youth, at a stage when they can most benefit. Olivia is the co-founder of fMRI club at Queen’s and an active member of the Centre for Neuroscience Studies Seminar Series committee.

Benjamin Cuthbert (PhD)
– ONTARIO GRADUATE SCHOLARSHIP

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.

Daniel Gale (PhD)
– NSERC GRADUATE SCHOOL SCHOLARSHIP

Dan is a second-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. Dan uses functional MRI to study the diverse contributions of sensory and cognitive systems to motor control and learning. He is not only interested in examining individual brain regions, but also
the broader interactions within functional networks of regions. Dan is also focused on building open-source software, which includes developing several packages that streamline the lab’s data management and processing pipelines, and contributing to widely adopted neuroimaging software.

Kathleen Harrison (PhD)
– ONTARIO GRADUATE SCHOLARSHIP

Kathleen Harrison is a 2nd year Doctoral fellow at the CNS, with the goal of characterizing model-parameters for experimentally induced focal cerebral ischemia in non-human primates. Stroke – being a loss of blood to the brain resulting in irreversible injury – shows heterogenous clinical and experimental presentations which impede evaluations of therapeutic safety and efficacy. Elucidating this observed variability may benefit the drug-development process for ischemic brain injury by defining experimental attributes required to meet statistical power. In pursuing this topic, Kathleen has supported several industrial research contracts in the Translational Stroke Research Lab, totalling ~2 million CAD. In addition to her thesis research, Ms. Harrison is a research assistant at the Queen’s Neuropsychology clinic. Kathleen strives to act as a mentor through her extracurricular activities, which include; co-lead of the Neuroscience Student Leadership Council; Steward to the PSAC901 Queen’s student union; participating in several Neuroscience Outreach Programs; acting as a graduate teaching assistant; and directly mentoring fellow graduate students. Upon completing her PhD, Kathleen will peruse a career outside of academia focusing on bio-sciences procurement and intelligence services.

Jeff Huang (PhD)
– PARKINSON’S SOCIETY SCHOLARSHIP

Jeff (Po Yueh) Huang is a PhD candidate under the supervision of Dr. Doug Munoz. He is studying the use of pupillometry in probing cognitive 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.
STUDENT AWARD RECIPIENTS
EXTERNAL AWARD HOLDERS

Jasmine Khan (PhD / MD)
– CIHR GRADUATE SCHOLARSHIP

Jasmine is a 2nd year MD/PhD candidate in Dr. Gord Boyd’s lab. She is currently exploring the impact of poor cerebral perfusion in critically ill patients in the intensive care unit (ICU). She is conducting a multi-centre clinical study to understand the relationship of reduced cerebral perfusion with the development of delirium and long-term cognitive and motor outcomes in ICU survivors. In doing so, Jasmine hopes to gain insight into the underlying processes that lead to poor recovery from critical illness. With the support of the CIHR CGS-M, she presented her work on a novel model of cerebral perfusion at the Critical Care Canada Forum.

Matthew Laporte (PhD)
– ONTARIO GRADUATE SCHOLARSHIP

Matt is a PhD student in Gunnar Blohm’s lab at the CNS, and researches models of body structure and movement control. Matt is also interested in applying emerging tools from structural mathematics and computer programming to better formalize and bridge various models, theories, and philosophies in neuroscience. Prior to his graduate studies at Queen’s, he studied biochemistry and chemical engineering at the University of Ottawa. Among other things, he is also an amateur pianist.

Blake Noyes (MSc)
– NSERC GRADUATE SCHOOL SCHOLARSHIP

Blake received her BSc in Psychology at Queen’s in 2018, during which she completed research projects in the fields of cognitive neuroscience and developmental psychology. She will be entering the second year of her MSc in Neuroscience in September, and is co-supervised by Dr. Doug Munoz, Dr. Linda Booij, and Dr. Sarosh Khalid-Khan. Blake’s master’s thesis focuses on using eye-tracking to characterize sub-threshold psychiatric disorders in adolescents at Hotel Dieu Hospital.
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). Now, Scott is in the first 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.)

Christopher Trimmer (PhD)
- ONTARIO GRADUATE SCHOLARSHIP, LATHAM FAMILY AWARD

Chris Trimmer is a PhD student in the department of Neuroscience at Queen’s University where his research examines the development and testing of a musical Cognitive Behavioural Therapy (CBT-Music) group therapy intervention for individuals with symptoms of serious mental illness. Chris has also taught courses in Music Psychology at Queen’s University.
Guilherme Braga de Freitas (PhD)
– HONOURABLE HUGH F. GIBSON AWARD

Guilherme is a Neuroscience Ph.D. Student in the Neuroscience Graduate Program at Queen’s University (2018-2022). He obtained his Master’s degree in Biochemistry by the Federal University of Rio de Janeiro (2017). His Bachelor’s degree was in microbiology and immunology, also by the Federal University of Rio de Janeiro (2014). He is currently developing the project entitled “Irisin: the hormone that highlights exercise’s beneficial effects through life”.

Bailey Brant (MSc)
– ROBERT SUTHERLAND

Bailey graduated from Queen’s University, with a Bachelors of Science Honours degree in 2019. He majored in Life Sciences, with a specialization in Neuroscience. His current research focuses on the neural mechanisms underlying pain triggered by consumption of monosodium glutamate, specifically in murine model of irritable bowel syndrome.

Brandon Caie (PhD)
– QEII IN SCIENCE & TECHNOLOGY

Brandon is a PhD student in the Computational Vision & Kinematics Group in the CNS. He completed his Life Sciences BSc at Queen’s with a neuroscience specialization, and an accelerated MSc before transitioning into the PhD program with Dr. Gunnar Blohm. He studies the neural basis of free choice decision-making, combining computational methods with advances in functional imaging and non-invasive brain stimulation. Outside of the lab he is interested in drug policy, addiction, ethics of technology, and audio synthesis.
INTERNAL AWARD AND FELLOWSHIP HOLDERS

Nancy Chen (PhD)
– THE QUEEN’S GANG AWARD

Nancy obtained her undergraduate degree and Master's degree at McGill University. She is currently in her third year of the MD/PhD program and is about to finish her first year of medical school. She studies a non-human primate model of chronic stroke and assess behavioral deficits using the Kinarm robot.

Jonathan Coutinho (PhD)
– WILSON FELLOWSHIP

Jonathan is a Ph.D. student in the Viking Lab researching vision, motor coordination, and decision making. He received my B.Sc.H. in Life Sciences from Queen's U (2016). He is passionate about community advocacy and public science communication. He likes animals, robots, eyeballs, sports and arts.

Pauline Gaprielian (PhD)
– GORDON WALLACE SWAN MEMORIAL FELLOWSHIP

Pauline completed her undergraduate degree (Bachelor of Science with Honours) majoring in neuroscience and bioethics at the University of Toronto. Currently, she is a PhD candidate at the Centre of Neuroscience Studies at Queen’s University. Her research is focused on using/developing an objective mode of assessment for patients with Parkinson’s Disease. In her spare time I like to bake, play sports and travel.
INTERNAL AWARD AND FELLOWSHIP HOLDERS

Rafaella Goncalves de Silva (PhD)
– WEBBER ENDOWMENT AWARD

Rafaella received her bachelor’s degree in Biological Sciences at the Federal University of Rio de Janeiro (Brazil) in 2015, and master’s degree in Biological Chemistry at the same institution in 2017. Rafaella is currently a PhD Candidate interested in understanding the molecular basis underlying the link between Alzheimer’s disease and Type 2 Diabetes with a focus on the involvement of tau protein.

Ryan Kirkpatrick (PhD)
– GRADUATE ENTRANCE TUITION AWARD

Ryan is an MD/PhD Candidate supervised by Dr. Doug Munoz, Dr. Linda Booij and Dr. Sarosh Khalid-Khan. She graduated from Queen’s Life Sciences and Psychology in 2018 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 projects is to identify objective, rather than subjective, measures of eating disorders and treatment response in youth.

Mavis Kusi (PhD)
– GORDON WALLACE SWAN MEMORIAL FELLOWSHIP

Mavis Kusi is currently in her final year of the PhD program in neuroscience at Queen’s University. Her supervisor is Dr. Martin Paré. Her research focuses on the effects of catecholamines (dopamine and norepinephrine) on working memory and the activational aspects of motivation (i.e. speed, vigor and persistence of motivated behaviour). The main goal of this research is to further the understanding of the neural mechanisms underlying cognition and motivation.
INTERNAL AWARD AND FELLOWSHIP HOLDERS

Bernie Longange-Kingiel (MSc)  
– MCLAUGHLIN/BRACKEN FELLOWSHIP

Bernie is a recent graduate from the University of Toronto, where he completed a major in Neuroscience, as well as minors in Psychology, and Ecology and Evolutionary Biology. At Queen's University, in the Centre for Neuroscience Studies, he is applying his passion for science and academic exploration to my MSc level research.

Joshua Moskowitz (PhD)  
– WILSON FELLOWSHIP

Joshua Moskowitz is a 4th year PhD candidate in the Cognition & Action Lab. His research interests are in the areas of sensory and motor neuroscience, with the goal of better understanding the cognitive processes which underlie the myriad of decisions we make in real-world action tasks, such as preparing a cup of tea. His projects have examined how movement-related factors, such as physical effort, influence how humans perform simple and skilled actions. His research was published in a recent issue of PLoS Computational Biology. Outside of the lab, you can find him playing ultimate frisbee and watching his favourite team, the Toronto Raptors.

Samira Osman (PhD)  
– MCLAUGHLIN/BRACKEN FELLOWSHIP

Samira Osmon received her undergraduate degree along with her M.Sc. in Biomedical sciences at the University of Balamand in Lebanon. She worked for a few years as a research assistant, and then started looking at PhD programs in Canada and specifically Queen's University. Samira ultimately chose the Centre for Neuroscience at Queen's to pursue her PhD and is currently a second year PhD student in the neuroscience graduate program. Her work currently focuses on anatomical tracing in the mouse gastrointestinal system, as well as aiming to understand how adipokine hormones modulate visceral pain.
INTERNAL AWARD AND FELLOWSHIP HOLDERS

Emma Robertson (MSc)
– FRANKLIN BRACKEN FELLOWSHIP

I’m a second year Master’s student. My research involves establishing normative values of cerebrospinal fluid biomarkers (amyloid-beta, tau, neurofilament light) in naive, colony control non-human primates. I look for factors that influence their levels such as age, sex, species and how we collect samples. In our non-human primate model of Alzheimer’s disease, I also track these biomarkers to look for disease progression.

Joanna Semrau (PhD)
– QEII IN SCIENCE & TECHNOLOGY

Joanna Semrau is a 3rd year PhD student at the CNS. Her project investigates the relationship between measures of cerebral perfusion during cardiac surgery and post-operative cognitive impairment. She assesses patients before and after surgery using the KINARM robotic system, which provides a quantified and objective approach to neurological assessment. She also screens cardiac surgery patients for post-operative delirium during their hospital stay, which is an acute, transient form of cognitive dysfunction that has been implicated in poor outcomes after surgery. Developing an accurate timeline of recovery for cardiac surgery patients will help determine the role of intraoperative cerebral oxygenation and inform appropriate strategies to prevent cognitive impairment in this patient population. In addition to her research project, Joanna is an active participant in many neuroscience outreach activities, including the child & adolescent psychiatry program, the Brain Bee competition, and the annual Brain Awareness Day. Joanna is also a member of the seminar series committee, a student-run speaker series that invites world-renowned scientists to give academic and mentorship talks to graduate students, post-doctoral fellows, and faculty members in the CNS.
Kaden Shearer (MSc)
– GRADUATE ENTRANCE TUITION AWARD, MCLAUGHLIN/BRACKEN FELLOWSHIP

Kaden is currently completing his Master’s degree (2021) at the Centre for Neuroscience Studies under the supervision of Dr. DJ Cook. He completed his Bachelor of Science degree at Queen’s University in 2019 with a specialization in Kinesiology. Kaden’s research focuses on integrating neuroimaging, helmet accelerometers, and movement biomechanics to study sport-related concussion and exposure to sub-concussive impacts. Through this research, he aims to explore how impact biomechanics and injury mechanisms relate to changes in imaging biomarkers as a method to optimize injury prevention and safety in contact sports.

Kaitlyn Tresidder (PhD)
– FRANKLIN BRACKEN FELLOWSHIP

Kaitlyn is a third year PhD candidate in the Bennett lab. Originally from Newmarket, Ontario, 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, she wishes to pursue a career as a clinician-scientist. In her spare time, Kaitlyn enjoys volunteering with the Neuroscience Outreach Program, and has co-coordinated the Kingston Brain Bee for the past several years. She also enjoys spending time with friends, crafting, and doing karate!
INTERNAL AWARD AND FELLOWSHIP HOLDERS

Jessica Vanderlinden (PhD)
– MCLAUGHLIN/BRACKEN FELLOWSHIP

Jessica Vanderlinden is a neuroscience PhD student from Queen’s University working under Dr. J. Gordon Boyd. Jessica holds two bachelor degrees from Waterloo University in Honors Science and Psychology. Currently Jessica’s primary focus of study is quantifying the neurocognitive status of patients across the spectrum of kidney disease. Their research was featured in The Council of Academic Hospitals of Ontario (CAHO) “Healthier, Wealthier, Smarter” blog. Their systematic review and meta-analysis (published in Nephrology) was also among the top 10% most downloaded papers. Outside of her studies Jessica enjoys traveling, reading, and spending time with her partner Bryce and cat Enzo.

Robert Wither (PhD)
– BOAG FAMILY FUND

Robert Wither completed his undergraduate at Queen’s University with an honours in Life Sciences in 2010. He then went on to complete a Masters in Physiology at the University of Toronto in 2012. He once again returned to Queen’s University in 2014 to start the MD/PhD program which he is anticipated to finish in 2021. Robert’s research focuses on developing and characterizing a non-human primate model of Alzheimer’s Disease. He successfully defended the PhD portion of his degree in January of 2020.
Graduate Student Outstanding Achievement Award – MSc Level
This award goes to the top ranked senior student enrolled full-time in the Masters Program. The selection of the recipient is based on academic merit and/or research excellence. In order to be considered for this award, students are required to submit their annual report.
2019 RECIPIENT – MATTHEW LAPORTE

Graduate Student Outstanding Achievement Award – PhD Level
This award goes to the top ranked senior student enrolled full-time in the doctoral program. The selection of the recipient is based on academic merit and/or research excellence. In order to be considered for this award, students are required to submit their annual report.
2019 RECIPIENT – OLIVIA CALANCIE

Neuroscience Research Day – Best 3 Minute Talks
Award is presented to one individual and is based on the clarity, presentation skills and the novel research presented.
2019 RECIPIENT – BRIANNA QUINVILLE

Neuroscience Research Day – Award for Best Poster
Award is presented to one individual and is based on the visual appeal, clarity and novel research presented.
2019 RECIPIENT – MITRA KNEZIC
NSCI-801*/3.0 Quantitative Neuroscience

In the fall of 2019 the Centre for Neuroscience Graduate Program launched a new graduate course, NSCI 801 Quantitative Neuroscience. This course was developed in response to a need identified by our current graduate students. Dr. Gunnar Blohm consulted with students to identify gaps in the current course offering and it was determined that there was a significant need for a statistics-based course. After much consultation with other researchers in various fields NSCI 801 was created. The course is a tutorial-based introduction to quantitative methods for neuroscience research. The goal is to provide Matlab/Python-based hands-on skills in signal processing, basic and advanced statistics, data neuroscience (machine learning) and model fitting methods.

Graduate/Post-Graduate Learning Plan

The Centre for Neuroscience Studies in consultation with the School of Graduate Studies introduced the Graduate/Post-Graduate Research Fellowship Learning Plan (GRF). This is a form that is used to provide support to graduate students / PDFs while they develop the research, professional and/or technical skills needed to complete their degree requirements. The Learning Plan supports trainees in developing and articulating their learning experiences and skill development. The plan is completed by the supervisor and the trainee in consultation where specific goals are discussed and reviewed annually and revised as needed. The Learning Plan has been designed to help the trainee to plan, and reflect upon, the activities that will be undertaken during the academic year, and to consider how these activities will contribute to the degree and program requirements as well as professional goals.

MR Controller Training Program

The Centre for Neuroscience Studies now offers PhD candidates and opportunity to be trained in running the Prisma MR System for the purpose of their own studies. This unique opportunity to learn to be an MR controller for those students who are focused on imaging as a career path. The program has been developed as a badge system whereby the training earns various level of badges until their full training is complete.
Industry certificate program
We are currently in the early stages of developing an Industry Certificate Program which will be made available for trainees in their 3rd year of PhD study. The program will be comprised of two components. The first is providing the students with a series of necessary resources which will teach them how to highlight and explain the how the skills they have obtained can be transferred to the industry work environment. The second is a four-month internship opportunity with an industry partner. Upon completion of their training program and the proposed certification, trainees will receive a certificate issued with the Queen’s seal as documentation of the professional skills training and internship that has been completed. The certificate will pose as a digital badge that will be used by industries to identify ideal candidates for their companies. Furthermore, the completion of the program/obtaining the badge will show industries that PhD holders possess the skills they are looking for and are not limited by the hard skills that they have obtained through their doctoral training.
A research-dedicated MRI facility is an essential component to any neuroscience program, allowing researchers to investigate the living human brain in great detail. Through support from the Canadian Foundation for Innovation, the CNS MRI facility became operational on August 14th, 2005, not long after the Centre for Neuroscience Studies was established in 2001. Over the last 14 years, approximately 6000 participants have been imaged for over 140 different research projects – leading to hundreds of research papers. Research goals have spanned the spectrum from answering important fundamental questions about the brain function and organization, to large multi-site studies searching for biomarkers of disease, to industry-sponsored clinical trials. Areas of investigation have included auditory and speech processing, motion perception, eye movements, decision making, pain, stroke, peer victimization, mindfulness, sexual health, memory and learning, among many others. A wide variety of disorders and diseases have been studied, including Alzheimer’s, Parkinson’s, Amyotrophic Lateral Sclerosis (ALS), Frontal Temporal Dementia, Epilepsy, Attention Deficit Hyperactivity Disorder (ADHD), Fetal Alcohol Spectrum Disorders (FASD), spinal cord injury, and Fibromyalgia. Our most recent research has focused on concussion, Chronic Traumatic Encephalopathy (CTE), as well as neuropsychiatric illness (major depression, bipolar, autism).
$1.1M PRISMA UPGRADE

Given the fast pace of technological advancements in the neuroimaging field, the CNS is happy to announce the installation of the latest state-of-the-art MRI system, the Siemens MAGNETOM 3T Prisma. Open for business on October 28th, 2019, this important upgrade to our facility was made possible through support from The Faculty of Arts and Science, The Faculty of Health Sciences, and The Office of VP Research. The Prisma is the next generation, whole body scanner, and was installed as a major upgrade to our current system. This system offers several advantages:

- The most powerful 3 Tesla magnet on the market – Industry leading stability and gradient performance, allow for high precision imaging of smaller tissues and enhanced tracking of brain connectivity.
- Faster, real-time imaging with higher signal-to-noise, finer spatial resolution, and improved patient comfort.
- Born from the NIH’s Human Connectome Project, the Prisma is designed for researchers, including both academic and clinical applications.
- Minimizing costs and downtime to the facility, allowing us to maintain our current research needs and open up new areas of exploration.
- An all-digital scanner that offers enhanced computing power for advanced imaging techniques that require computationally intense image reconstruction.
PERIPHERAL INFRASTRUCTURE UPGRADES

As the MRI itself aged, so did the facility, including the waiting rooms and peripheral equipment. Through a design consultant, we modernized the aesthetics of the MRI Facility, including renovating the waiting area with new furniture to accommodate the needs of all participants. Through multiple successful grants from the Natural Sciences and Engineering Research Council of Canada (NSERC)’s Research Tools and Instruments (RTI) Program, we have purchased state-of-the-art peripheral equipment, including:

- Button boxes from Current Design Inc.
- New high fidelity sound systems from SENSIMETRICS CORPORATION.
- BIOPAC system for the high frequency digitization of physiological measurements.
- High definition in room video monitoring and recording.
- The premiere MRI-compatible video system from VPixx Technologies.
- Display computers have been upgrade to the latest high performance hardware.
- SR Research Eyelink 1000 eye tracker to be compatible with the Primsa hardware.
- The MRI is now equipped with a research specific penetration panel, allowing all of our systems to work in the MRI environment without introducing RF noise.

PILOT TIME COMPETITION

With the MRI open for business, we were pleased to launch new initiatives to support our CNS members and their trainees. An internal MRI pilot time competition is now held annually for full-time faculty conducting basic, clinical and health services investigations at Queen’s University, the Kingston Health Sciences Centre (Kingston General Hospital, Hotel Dieu Hospital), and/or Providence Care. The MRI pilot time grant provides successful applicants a $100 per hour rate reduction on MRI scanning rates. We will fund a maximum of 8 grants through this program each year: 3 for early researchers in the CNS, 3 for senior researchers in the CNS, and 2 for non-CNS members in the Queen’s community.

OPERATOR TRAINING PROGRAM

An operator training program was launched, primarily aimed at PhD candidates and postdoctoral fellows with a primary focus on imaging as their field of study and career path. Under the guidance of trained MRI staff, this program allows these trainees to build practical experience in MRI data collection on their own projects. This program will help propel imaging students to careers as our future imaging investigators.
IT INFRASTRUCTURE

The Centre for Neuroscience Studies has invested heavily in IT Infrastructure over the years. Our high-performance computing environment provides a wide array of services that our Students, Faculty and Staff rely on daily. Service includes high performance computing, web and database hosting, data storage, data backup, and disaster recovery.

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
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

CONFERENCES:
“A Neurotech Future: Ethical, Legal and Policy Issues” Sept 24-26, 2020
Susan Boehnke1,2, Martha Bailey2,3, David Lyon4
Department of Biomedical and Molecular Sciences 2. Center for Neuroscience Studies. 3. Law 4. Surveillance Studies Centre
This conference will initiate a conversation about ethical and legal issues involved with the integration of neurotechnologies into society, and policy considerations to mitigate them. We seek to include a spectrum of voices from scholars in the neurosciences, social sciences and humanities, along with innovators from industry and policy makers. This conference is funded by a SSHRC connection grant, along with additional funding by the Ontario Brain Institute, Faculty of Law, Centre for Neuroscience Studies, Dunin-Deshpande Queen’s Innovation Centre (Mitchell Hall) and the Dan School of Drama and Music.

SEMINARS:
Friday Fights Seminar (Centre for Neuroscience Studies, Nov, 2019)
Susan Boehnke
“Teaching about neurotechnology and neuroethics”

Joint Seminar with Surveillance Studies Centre (Jan 8, 2020)
Jonathan Coutino, Pauline Gaprielian, Susan Boehnke
“Current Practices and Future Potential of Neurotechnologies’ Role in Society”
Neugeneration Conference (Queen’s University, Jan 19, 2020)
-Eyetracking workshop (Jonathan Coutino and other CNS students)
-Merlin Neurotech EEG workshop

Queen’s Retirees Association seminar (University Club, Feb 19 2020)
Susan Boehnke
“What are neurotechnologies, what’s new, and how might they affect society?”

Programs in Development

NEUROSCIENCE AND BUSINESS
In 2019 we partnered with the Smith School of Business Executive Education and Nielsen Neuroscience to create an interactive 2-day program geared at businesspeople to provide a general overview of neuroscience techniques and their use in understanding consumer behavior. This program is currently being redeveloped into an online course by the CNS to increase accessibility.

NEUROSCIENCE AND THE LAW
Initiation of a partnership with the The Law Society of Ontario to integrate neuroscience into their executive education offerings to lawyers.

PLANNED OUTCOMES
1) Policy paper on neurotechnology use and surveillance issues.
2) Curriculum Development:
   Interdisciplinary graduate course in Neuroethics. This includes graduate students from the Centre for Neuroscience Studies, Law, Sociology, Philosophy, Business, Engineering and beyond
   Certificate in Neurotechnology for Undergraduates. This is geared towards undergraduate degree programs such as engineering, computer science and business
FUTURE PROGRAM DIRECTIONS

NEUROSCIENCE AND EDUCATION

• An overview of current neuroscientific progress in understanding neurodevelopmental disorders such as Autism, ADHD, Dyslexia and other intellectual disabilities
• Designed for teaching professionals, especially special education providers

NEURODIVERSITY IN THE WORKPLACE (HR WORKSHOP)

• Introduction to the neuroscience underlying common neurological disorders
• Advantages and challenges with integrating people with neurological differences into the workplace. Guidance on how to support current employees who develop neurological disorders, such as Parkinson’s.

“Neuroscience is intersecting with society – especially in business, law, and education. We have an obligation to communicate our current understanding of the brain to everyone – academia, industry and beyond.”

Susan Boehnke (Lead Executive Education)
The student-led CNS 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.

We hosted a total of 13 speakers (6 males & 7 females): 2 growing up science (GUIS) talks, and 11 academic talks.
LIST OF SPEAKERS FOR 2019 / 2020

October 2 2019
DR. DOUG MUNOZ
Growing Up in Science Talk
Department of Biomedical and Molecular Science, Queen’s University

October 9 2019
DR. MARTIN ROLFS
Academic Talk: All is not lost: The fate and function of vision during saccades
Department of Psychology, Bernstein Centre for Computational Neuroscience, Humboldt University

October 30 2019
DR. SERGIO FERREIRA
Academic Talk: Zika virus hijacks Alzheimer-related pathogenic mechanisms to impair synapses and memory
Institute of Medical Biochemistry and Institute of Biophysics Carlos Chagas Fiho
Federal University of Rio de Janeiro

November 6 2019
DR. KATHERINE DUNCAN
Academic Talk: Opening windows of opportunity to modify human memory
Department of Psychology, University of Toronto

December 4 2019
DR. PATRICK STROMAN
Academic Talk: Ten things about fMRI pain that will blow your mind
Department of Biomedical and Molecular Science, Queen’s University

December 11, 2019
DR. KATALIN TOTH
Academic Talk: Information processing and action potential coding in the hippocampus
Brain Research Centre, University Laval

January 15, 2020
DR. DORA ANGELAKI
Academic Talk: Using optic flow to understand brain computation: successes, challenges & new directions
Department of Neuroscience, Baylor College of Medicine

January 22, 2020
DR. ISABELLE AUBERT
Academic Talk: Therapeutic applications of MRI-guided focused ultrasound and blood-brain barrier modulation for neurodegenerative disorders
Sunnybrook Research Institute, University of Toronto

January 28 2020
DR. KATHLEEN CULLEN
Growing Up in Science Talk
Academic Talk: Neural representations of natural self-motion: implications for perception and action
Neuroscience & Biomedical Engineering, John Hopkins University

February 5, 2020
DR. LINDA BOOI
Academic Talk: Environmental influences on human brain development: epigenetic mechanisms and risk for psychopathology
Department of Psychology, Concordia University
February 12, 2020
DR. ALAN LOMAX
Academic Talk: Beyond the hype: can gut microbes alter gut-brain communication
Gastrointestinal Diseases Research Unit, Queen’s University

February 26, 2020
DR. GUSTAVO TURECKI
Academic Talk: How pain shapes the brain: impact of childhood trauma on suicide risk
Douglas Research Centre, McGill University

March 4, 2020
DR. CLAUDIA GRILLO
Academic Talk: Identifying a new circuit that controls feeding behaviour: leptin & serotonin interactions
Pharmacology, Physiology & Neuroscience, University of South Carolina
The Neuroscience Outreach Program (NOP) in the Centre for Neuroscience Studies (CNS) is a nationally acclaimed outreach program aimed at improving the Kingston community’s understanding and awareness of neuroscience. NOP was formed by students looking for a way in which to interact with each other, the department, and the Kingston community in a socially purposeful manner. All of our outreach programs are student-led and student-driven and designed to engage both researchers and the community. Currently, NOP offers twelve unique programs. Whether students wish to participate in a public lecture series, perform hands-on experiments with children and youth, or provide companionship to seniors in the community through arts and crafts, there is an outreach program for everyone. The CNS and the Student Leadership Committee are also happy to help with the creation of new outreach programs to ensure that each of our graduate students is able to get involved in a personally meaningful and impactful way.
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. There are many individuals with developmental and/or intellectual disabilities that graduate high school and are: uninterested in current programs, searching for motivation and/or require opportunity to foster skills for employment. So, BOP was created to facilitate purpose in the lives of those involved and to create a social connectivity between all participants and volunteers. The objective was to develop a team of volunteers and participants to create and sell homemade bracelets. Currently, BOP has collaborated with Community Living Kingston, to recruit individuals that would be interested in this type of opportunity.

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. The day of the event, the students are asked to submit research posters to us which are on display. The top posters are rewarded with prizes. This is an exceptionally well-received event with waiting lists each year of schools looking to participate.

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. The goal for each Brain Badge session is to teach kids all about the brain. Our outreach volunteers meet various groups in the Kingston community and surrounding area to give 1-hour long sessions on Brain Safety, Mental Health, Learning & Memory and more.
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. Students self-study topics related to the brain and nervous system, and then compete at Queen’s University in early April for the title of “best brain”. Competition day is open to the general public and includes numerous activities including a tour of the School of Medicine’s Anatomy Museum and a Student Career Panel.

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. Our volunteers are passionate scientists who want to share their experience and love of learning. By using interactive experiments and demonstrations, we engage our pupils in the world of neuroscience and thinking outside the box. Using real samples, videos and activities, we create a fun and engaging learning environment.

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.
CESAP
The Concussion Education Safety and Awareness Program (CESAP) is an outreach initiative led by Queen’s students from the Faculties of Medicine and Neurosciences. Our goal is to provide concussion education sessions in accordance with Rowan’s Law to high school students and young athletes in the Kingston area. Education sessions are executed through one-hour small group learning classroom sessions led by MD, MSc and PhD students, with the presentations tailored to the context of the class curriculum and Rowan’s Law. The role of students from the Center for Neuroscience studies is to provide evidence-based research into concussion prevention and management, with the help of local physicians and following Rowan’s Law guidelines.

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. During our visits we aim to engage patients in some sort of physical activity (yoga, stretches, wii games), craft (coloring, painting, holiday-themed craft), or game (cards, board games, puzzles). 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. We aim to promote evidence based decision making in public policy, including areas like healthcare, environmental responsibility, tech & bioethics, stigma & discrimination, AI/machine learning. We also collaborate with external organizations towards our common goals of scientific and community advocacy.
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. The Faculty of Education at Queen's University hosts the annual Science Rendezvous Kingston at the Leon’s Centre in the downtown of the city. 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. The Centre for Neuroscience Studies is in attendance each year with a team of 8-10 graduate students to run interactive neuroscience demonstrations and to speak to the public about the research taking place within the Centre.

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. These crafts are usually themed which can include things such as special occasions, seasons or holidays. The Social Club takes place on a monthly basis, for one hour in the evening.