THE PAST, PRESENT, AND THE FUTURE
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Welcome to the 2024 Neuro Retreat.

The annual Neuro Retreat is always a fantastic opportunity to connect with colleagues, learn about exciting initiatives at The Neuro and take advantage of the local surroundings. We are excited to let you know that we have aimed high this year, prioritizing activities and themes that will connect our community and reinforce our common goals. We have integrated team building directly within the programme, prioritized panel discussions for enriching scientific discussions and organized thematic round tables. We aim at creating new—and strengthening existing—networking and collaboration opportunities.

2024 is also a special year as it marks three important milestones: The Neuro’s 90th anniversary, the MS programme’s 75th, and the BIC’s 40th. It is thus an opportunity to reflect on all the amazing things that have been accomplished and to set our sights on many more accomplishments for our institute’s future.

This year’s scientific programme includes a combination of lectures and symposia. We will learn about the activities and key priorities of the Cognitive Neuroscience Unit and the McConnell Brain Imaging Centre (BIC), as well as how Artificial Intelligence can revolutionize and strengthen research and clinical work. Our three keynote lectures will highlight the integration of research and clinical activities (by Pr. Jo Anne Stratton), Building Next Gen Brain Imaging Tools for Population Neuroscience and Global Health (by Pr. Udunna Anazodo) and Quantitative MRI across species (by Pr. Christine Tardif). The retreat will also feature a spotlight on international collaborations and Open Science. New this year, we are giving voices to nurses to hear about their perspectives about patients and how their feedback is crucial for improving clinical care and related research. As in previous years, we will also hear presentations from some of the newest Neuro faculty members, who will introduce themselves and their work. Our programme also includes extra-curricular activities aimed at fostering further connections while providing opportunities for relaxation.

Special thanks to Debbie Rashcovsky, Events Manager and her team for coordinating the planning process as well as events during the Retreat. Thanks to the members of the Neuro Retreat Planning Committee for their valuable feedback and approval of the scientific program. We wish everyone an enjoyable and productive time during the next three days.

Justine Cléry, PhD
Chair, The Neuro Retreat 2024
Assistant Professor, Department of Neurology and Neurosurgery, McGill University
Director, Sensory and Social Brain Mechanisms (SSBM) Lab, The Neuro
Research member, Azrieli Centre for Autism Research (ACAR)
Friday, June 7

12:00 - 13:00  Arrival, Registration and Lunch (Lobby & Dining Room)

Matterhorn Room

13:00  Welcome & Opening Remarks - Guy Rouleau, Director
Retreat Goals - Justine Cléry, Retreat Chair

13:15  Spotlight on International Collaborations Launched by The Neuro
Stefano Stifani, Distinguished James McGill Professor

13:30  Plenary 1: Integration of Research and Clinic - Single Cell Overview
Jo Anne Stratton, Assistant Professor

14:10  Spotlight on New Recruits at The Neuro
Chair: Edward Fon, Scientific Director

Discovery of Tumorigenic Mechanisms and Therapeutic Targets in Diffuse Gliomas
Jérôme Fortin, Assistant Professor (Brain Tumour group)

Understanding Multiple Sclerosis Lesion Pathology at a Single Cell Level
Stéphanie Zandee, Researcher (Neuroimmunological Diseases group)

14:45  Spotlight on TOSI Open Science

Overview of the Tanenbaum Open Science Institute (TOSI) Initiatives to Support The Neuro Community
Gabriel Pelletier, Research Data Manager, TOSI
Luisa Pimentel, Open Science Community Officer, TOSI

15:05  Refreshment Pause

Udunna Anazodo, Assistant Professor

16:10  Spotlight on Nursing Care
Chair: Heather Perkins, Advanced Practice Nurse, Neurosurgery

16:15  Strategies to Maintain Access to Patient Care Amidst Human Resources Challenges
Georgia Niarchos, Associate Director, Neurosciences Mission

16:45  Enhanced Recovery after Surgery for Malignant Brain Tumours
Roberto Diaz, Neurosurgeon
Heather Perkins, Advanced Practice Nurse, Neurosurgery

Panel Discussion

17:30 - 18:30  Free Time

18:00  Children’s Early Dinner (Edelweiss A)

18:30  Cocktail (Esplanade)

19:30  Dinner & Neuro Trivia Game (La Tablée)
Saturday, June 8

7:00 - 9:00  Breakfast (Dining room/St. Moritz)
7:45 - 8:30  Organized Run (departs at 7:45)
9:00 - 11:30 Childcare Room (Edelweiss A)

Everest A
9:00  90th Anniversary of The Neuro
Damien Chalaud, Senior Director of Communications
9:10  The McConnell Brain Imaging Centre Celebrates its 40th Anniversary
Julien Doyon, Director, McConnell Brain Imaging Centre
9:20  Plenary 3: Quantitative MRI in Humans, Mice and Marmosets
Christine Tardif, Assistant Professor
9:50  Symposium 1: Changing the Future with AI
Introduction: Pouya Bashivan, Assistant Professor
9:55  Transforming Spine Specialist Wait Times: Transitioning from Paper Forms to an AI-Enabled Application
Carlo Santaguida, Neurosurgeon
10:10  Using AI to Support Treatment Decisions in MS
Doug Arnold, Neurologist
10:25  Refreshment Pause (Everest Hall)
10:40  Helmholtz International BigBrain Analytics & Learning Laboratory (HIBALL)
Alan Evans, Neuroscientist
10:55  AI: The Next Frontier in Surgical Education
Rolando Del Maestro, Neurosurgeon
11:10  Panel Discussion
11:30 – 12:15  Team Building Activity
12:00 – 13:15  Lunch (Dining room, Terrasse Tablée & St-Moritz)
13:00 –17:30  Free Time & Extracurricular Activities (hike, painting)
16:15–17:00  Writing Workshop by Monique Polak (Edelweiss A)
16:30–17:00  Children’s Team Building for Families (Edelweiss B)
17:30  State of the Union Address - Guy Rouleau, Director (Everest B)
18:15  Children’s Early Dinner (Edelweiss A)
18:30  Cocktail (Exterior Esplanade)
19:30  Dinner & Silent Art Auction (Everest A)
Post-Dinner Activities (poker, card games, children’s corner)
Sunday, June 9

7:00 – 9:00  Breakfast (Dining room/St. Moritz)
8:00 – 8:45  Yoga (Edelweiss A)
9:00 – 11:30  Childcare room (Edelweiss A)

Everest A

9:00  Symposium 2: Cognitive Neuroscience Unit
Introduction & Chair: Nathan Spreng, Associate Professor

9:05  Predictability Over Uncertainty: A Decision-Making Bias Related to Locus Coeruleus Integrity in Older Adulthood
Nathan Spreng

9:20  Enhancing the Applied Impact of Cognitive Neuroscience: Early Lessons From a Novel Research Development Paradigm
Madeleine Sharp, Neurologist, Assistant Professor

9:35  Translating Cognitive Neuroscience to Promote Healthy Aging
Maiya Geddes, Assistant Professor

9:50  Inducing Neural Plasticity in Auditory Circuits Via Brain Stimulation, Training, and Sensory Input
Robert Zatorre, Cognitive Neuroscientist

10:05  Panel Discussion

10:25  Refreshment Pause

Trainee Presentations

10:35  Dorsomedial Frontal Cortex Damage Impairs Error-Based, But Not Reinforcement-Based Motor Learning in Humans
Dimitrios Palidis, Lesley Fellows Lab

10:45  A Comparative Definition of the Ventral Frontal-Temporal-Occipital White Matter Pathways in the Monkey and Human Brain
Kep Kee Loh, Michael Petrides Lab

10:55  Closing Remarks – Nathan Spreng

11:00  Toward Tomorrow: Round Table Session
AI, BIC, TOSI, Philanthropy, Clinical Research-Partnerships, Communications, and Hospital Clinical Activities

12:00  Concluding Remarks

12:15  Free Time & Lunch (Terrasse Bar/Dining Room)
Guy Rouleau, OC, OQ, MD, PhD, FRCPC, FRSC, FAAN
Dr. Guy Rouleau is Director of The Neuro (Montreal Neurological Institute-Hospital), Chair of the Department of Neurology and Neurosurgery of McGill University, Director of the Department of Neuroscience of McGill University Health Centre, and co-founder of the Tanenbaum Open Science Institute. In 2022, he was elected First Vice-President of the World Federation of Neurology. For almost 35 years now, Dr. Guy Rouleau and his team have focused on identifying the genes causing several neurological and psychiatric diseases, including autism, amyotrophic lateral sclerosis, hereditary neuropathies, epilepsy and schizophrenia, as well as providing a better understanding of the molecular mechanisms that lead to these disease symptoms. Among Dr. Rouleau’s main achievements are his contribution to the identification of dozens of disease-causing genes and his discovery of new mutational mechanisms. Dr. Rouleau has published nearly 1,000 articles in peer-reviewed journals and has been quoted more than 100,000 times (Google Scholar). He has supervised more than a hundred students at the Masters, PhD and Post-doctoral levels in addition to receiving numerous awards for his contribution to science and society. As co-founder of the Tanenbaum Open Science Institute, Dr. Rouleau is pioneering a new way of doing research by transforming The Neuro into the first academic institution to adopt Open Science principles in order to accelerate discovery and benefit patients and society.

Justine Cléry, PhD
Justine Cléry is an Assistant Professor at the Department of Neurology and Neurosurgery, Faculty of Medicine and Health Sciences at McGill University, and the head of the Sensory and Social Brain Mechanisms Lab. She is a member of the Azrieli Centre for Autism Research. She completed her Ph.D. in Neurosciences in 2017 at the University of Claude Bernard Lyon 1, under the supervision of Dr. Suliann Ben Hamed, at the Institut des Sciences Cognitives, Lyon, France. From 2017-2021, she was a postdoctoral associate, working with Pr. Stefan Everling in the Laboratory for Neural Circuits and Cognitive Control, at Robarts Research Institute, University of Western Ontario, Canada. In her research, she is interested in how sensory information and social cognition are encoded in the brain and uses functional magnetic resonance imaging (fMRI) and behavioral data collection in non-human primate models to better understand these brain mechanisms across the lifespan in control and disease models.
SPEAKER BIOGRAPHIES

**Udunna Anazodo, PhD**
Prof. Anazodo completed her doctoral training in Medical Biophysics at Western University and was a MITACS Accelerate Fellow at The Lawson Health Research Institute. She leads the Multimodal Imaging of Neurodegenerative Disease (MiND) Lab at The Neuro where her group develops PET and MRI techniques for quantitative neuroimaging. Prof. Anazodo is very passionate about improving access to diagnostic imaging with focus on population and global health. She is the current Chair of the International Society for Magnetic Resonance in Medicine (ISMRM) PET-MRI Study Group. She is also the founder and Chair of the Consortium for Advancement of MRI Education and Research in Africa (CAMERA), a global network of MRI experts working to establish sustainable access to high-value MRI in Africa through local capacity building.

**Douglas Arnold, MD**
Douglas Arnold, MD is a Professor in the Department of Neurology and Neurosurgery at McGill University, Director of the Magnetic Resonance Studies lab in the Brain Imaging Center at The Neuro, President of NeuroRx Research, a CNS imaging CRO dedicated to drug development for MS. He has special expertise in advanced MRI acquisition and analysis techniques, particularly as they relate to understanding the evolution of multiple sclerosis and its response to drug therapy. He leads an effort, funded by the International Progressive MS Alliance and MS Canada to develop novel AI algorithms to predict progression and treatment response in MS.

**Damien Chalaud**
Damien Chalaud is the Senior Director of Communications at The Neuro. He graduated from the University of London - Goldsmiths College with a Master’s degree in Communications and a Master’s degree in Journalism. He was a journalist and producer at BBC Radio and the BBC World Service from 1993 to 1997. In 1998 he joined the European Broadcasting Union in Geneva as Director of Eurosonic operations. In 2001 Damien was appointed Director of the cross-media platform at RFO-France Télévisions. From 2004 to 2007 he became Director of content for the Radio France CityRadio network in Paris. From 2008 to 2013 he was project manager and consultant for different international broadcasters and web/mobile entities: BBC, CBC, Radio-Canada, ARD, RTE, O2, etc. From 2013 to 2017 he was the Executive Director of the World Federation of Science Journalists.

**Rolando Del Maestro, MD, PhD**
Dr. Del Maestro’s present position is the William Feindel Professor Emeritus in Neuro-Oncology, Professor, Department of the Social History of Medicine, and Director of the Neurosurgical Simulation and Artificial Intelligence and Learning Centre at McGill University. The goal of the Centre’s research is the globalization of safe surgery through the utilization of simulation and artificial intelligence. His research is focused on the creation and testing of comprehensive VR platforms for surgical bimanual technical skills assessment and training utilizing AI powered intelligent tutoring systems such as the Virtual Operative Assistant (VOA) and Intelligent Continuous Expertise Monitoring System (ICEMS). Present research involves integrating ex vivo brain simulations as hybrid models to develop the human ‘Intelligent Operating Room’ powered by their advanced AI deep learning technology for surgical learner assessment, training, and mitigation of surgical errors.
SPEAKER BIOGRAPHIES

**Alan Evans, PhD, FRCS**

Alan Evans is a Distinguished James McGill Professor of Neurology and Psychiatry and Victor Dahdaleh Chair in Neurosciences. He is Scientific Director of McGill’s “Healthy Brains for Healthy Lives” initiative and the Canadian Open Neuroscience Platform. He is co-directs the Ludmer Centre for Neuroinformatics and Mental Health, using high-performance computing to integrate imaging, behavior, genetics data in research on neurodegeneration and neurodevelopment. He has 734 publications (h-index=210) and is a Clarivate Highly Cited Scientist (99,111 citations). He is a Fellow of the Royal Society of Canada and 2017 Chair of the Organization for Human Brain Mapping. Prizes include the Margolese Human Brain Disorders Prize (2014), Wilder Penfield Prix du Québec (2016), Senate of Canada 150 Medal (2017), Heinz Lehmann Prize in Neuropsychopharmacology (2018), OHBM Glass Brain (2019), Killam Prize in Health Sciences (2020), Royal Society McLaughlin Medal (2021).

**Roberto Jose Díaz, MD, PhD, FRCS(C)**

Dr. Díaz is a neurosurgeon with subspecialty training in neurosurgical oncology. He has been in practice at The Neuro since 2016 and is involved in both clinical and basic science research to advance the treatment of patients with malignant brain tumours.

**Julien Doyon, PhD, FRSC, FCAHS**

After completing his Ph.D. in 1988 at The Neuro under the supervision of Prof. Brenda Milner, Prof. Doyon was an assistant professor in the Department of Psychology at Laval University until 2000. He then moved to University of Montreal where he became the founding Scientific Director of the Functional Neuroimaging Unit from 2004 to 2017 and founding Director of the Quebec Bio-Imaging Network (QBIN) from 2008 to 2019. Currently, Julien Doyon is Director of the McConnell Brain Imaging Center at The Neuro and professor in the Department of Neurology and Neurosurgery at McGill University. Finally, for his scientific contribution, Prof. Doyon obtained the 2011 Canadian Society for Brain Behavior & Cognitive Sciences (CSBBCS) - Richard C. Tess Award and was named Fellow of this Canadian society in 2017, in recognition of his outstanding contribution to the advancement of knowledge and leadership in the field of cognitive neuroscience and neuroimaging. He was awarded the 2012 ACFAS - Léo Pariseau prize highlighting the excellence and international impact of his work and was elected Fellow of the Royal Society of Canada in September 2017 as well as a member of the Canadian Academy of Health Science in 2018.

**Edward Fon, MD**

Dr. Edward Fon is a full Professor in the Department of Neurology and Neurosurgery at McGill University and the Scientific Director of The Neuro. He is a clinician-scientist at the Neuro where he practices in the area of Parkinson’s disease and movement disorders. He serves as Director of the McGill National Parkinson Foundation Centre of Excellence and of the FRQS Quebec Parkinson Network.
Kep Kee Loh, PhD
Kep Kee Loh is a cognitive neuroscientist who is curious about what makes our brains special compared to other primates. Brains are highly complex structures and can vary in their overall or regional sizes, cortical folding patterns, connectivity, and underlying cellular organization. As such, he employs a combination of MRI-based and histological techniques to compare different aspects of brain organization across individuals and species. At the Petrides Laboratory, he is investigating the relations between cortical sulcal morphology, cytoarchitecture, and white matter connectivity across humans, chimpanzee and macaque brains.

Maiya Geddes, MD, FRCPC
Maiya Geddes is a clinician scientist, Killam Scholar, and an Assistant Professor in the Department of Neurology and Neurosurgery. After completing a residency in neurology at McGill, Dr. Geddes completed a CIHR-funded postdoctoral research fellowship at MIT and a separate clinical subspecialty fellowship in Behavioural Neurology and Neuropsychiatry at Harvard. She directs a research program at The Neuro focused on understanding the neurobiological mechanisms underlying motivational resilience in aging and Alzheimer’s disease to apply these findings to help older adults lead healthier and more fulfilling lives. Dr. Geddes applies a converging methods approach that combines cutting-edge behavioural and multi-modal neuroimaging techniques. She is a Lead Researcher on HBHL’s CONNECT project and a PI on Phase III of the Canadian Consortium on Neurodegeneration in Aging. Her research is supported by the NIH, CIHR, HBHL, Brain Canada, Alzheimer Society Research Program, NSERC and FRQS.

Jerome Fortin, PhD
Jerome Fortin is an Assistant Professor in the Department of Neurology and Neurosurgery. He joined the McGill faculty in October 2023. Previously, he completed his PhD at McGill University (Department of Pharmacology and Therapeutics). He then pursued postdoctoral training at Princess Margaret Cancer Centre in Toronto, where he led studies focused on brain tumors and leukemia. His current research program focuses on discovering how brain tumors emerge, evolve, and could be treated.

Georgia Niarchos
Georgia Niarchos is the Associate Director of the Neurosciences Mission of the MUHC. A nurse for over 25 years, Georgia has worked at hospitals in both Canada and the United States. She has worked as a Nurse Educator at the MUHC, and has taught in the Nursing Program at John Abbott College and at the Ingram School of Nursing, McGill University. Georgia served as Nurse Manager of the Neurology and Traumatology units at the Montreal General Hospital. During her tenure, she oversaw countless quality improvement projects at the unit and organizational levels and overseeing a massive restructuring project. She has been Associate Director of the Neurosciences Mission since 2019, during which time she has steered The Neuro through the Covid pandemic and served as project lead on an extensive MUHC-wide patient communication restructuring project.
Dimitrios Palidis, PhD
Dimitrios Palidis is a postdoctoral researcher at The Neuro in the laboratory of Dr. Lesley Fellows, in the department of Neurology and Neurosurgery. He received his PhD in neuroscience from Western University under the supervision of Prof. Paul Gribble. His research focuses on the neural basis of adaptive motor control and learning. His work has primarily involved the behavioural study of upper limb motor control combined with electrophysiology, pharmacology, human lesions studies, and eye tracking. His position is funded by a CIHR postdoctoral award.

Gabriel Pelletier, PhD
Gabriel Pelletier joined The Neuro’s Tanenbaum Open Science Institute (TOSI) in 2022 as the Open Science Data Manager. In this capacity, he supports research labs in sharing data and other research outputs, measures the uptake of Open Science practices at The Neuro and supports the implementation of several TOSI programs and initiatives. He is also currently serving as the interim TOSI Alliance Officer, liaising with Canadian neuroscience partner institutes that have adopted Open Science with TOSI, and supporting others in the progress of doing so. Before joining TOSI, Gabriel obtained his PhD in Neuroscience from McGill University, studying the roles of frontal lobe subregions in decision-making and reward-guided behavior, supervised by Dr. Lesley Fellows at The Neuro.

Luisa Pimentel, PhD
Luisa Pimentel is a neuroscientist with over 20 years of experience, including 5 at The Neuro. She obtained her doctorate in the Department of Pharmacology and Therapeutics at McGill and, before joining the Tanenbaum Open Science Institute (TOSI) team, she worked as a project coordinator for outreach and training programs at The Neuro’s Early Drug Discovery Unit (EDDU). As TOSI Open Science Community Officer, her role is to foster and support The Neuro’s Open Science community through the organization of training sessions, webinars, workshops, and seminars, career incentive programs and awards, as well as initiatives to promote peer-to-peer knowledge translation, among others.

Carlo Santaguida, MD, FRCS(C)
Dr. Carlo Santaguida is currently the Neurosurgery Program Director and Associate Professor at McGill University. With a comprehensive skill set spanning from minimally invasive techniques to complex deformity correction, he is dedicated to enhancing patient functionality and quality of life. Dr. Santaguida prioritizes quality assurance and employs data collection to assess both surgical and non-surgical interventions, ensuring the best possible outcomes for his patients. Currently, he is building a large dataset comprising of patient-reported outcomes and imaging, aiming to utilize machine learning to predict spontaneous recovery in non-surgical cases and individual responses to surgical treatments.
Madeleine Sharp, MD
Madeleine Sharp is a neurologist and clinician-scientist specializing in movements disorders at The Neuro, McGill University. Her research focuses on understanding the cognitive mechanisms underlying cognitive and behavioural symptoms in patients with neurodegenerative disorders, in particular, Parkinson’s disease. The long-term goal is to develop a framework for understanding the many cognitive and behavioural phenotypes of Parkinson’s disease that takes into consideration genetics, pathophysiology, co-morbidities and social factors.

Nathan Spreng, PhD
Nathan Spreng is a James McGill Professor of Neurology and Neurosurgery, Group Leader of the Cognitive Neuroscience Unit, member of the Royal Society of Canada, and the Director of the Laboratory of Brain and Cognition at the Neuro. His research examines large-scale brain networks and their role in cognition. Current investigations into human decision-making, social navigation, and intersections between memory and executive function are supported by the NIH, CIHR and NSERC. Prof. Spreng is particularly interested in identifying changes in the pre-symptomatic progression of Alzheimer’s disease, towards identifying intervention targets. He is also actively involved in the development and implementation of multivariate and network-based statistical approaches to assess brain structure, connectivity and activity. In doing so, he aims to better understand trajectories of lifespan development, relating the brain to behaviour, in health and disease.

Stefano Stifani, PhD
Stefano Stifani is a Distinguished James McGill Professor in the Department of Neurology & Neurosurgery at McGill University. He obtained a Ph.D. degree in Biochemistry from the University of Alberta in Edmonton, AB, Canada. He also holds a doctorate in Chemistry from the University of Rome, Italy. He is a former Killam Scholar at The Neuro and Chercheur National Research Scholar of the Fonds de recherche du Québec – Santé. Prof. Stifani serves as The Neuro Associate Director (Research), and as Associate Director (Fundamental Research) of McGill’s Azrieli Centre for Autism Research. He also serves as the Secretary-General of the International Society of Developmental Neuroscience and Editor-in-Chief of the International Journal of Developmental Neuroscience. Research in Prof. Stifani’s laboratory focuses on understanding the biology of neural stem/progenitor cells in the healthy and diseased nervous system, as well as harnessing the potential of human induced pluripotent stem cells to establish disease-relevant experimental model systems to study neurological diseases and disorders.

Jo Anne Stratton, PhD
Jo Anne Stratton is an Assistant Professor in the Department of Neurology and Neurosurgery at The Neuro, McGill and holds a Junior 1 FRSQ Career Award in Neuroimmunology. She is the co-Lead of the Single Cell Neurobiology Initiative at McGill and the co-Chair of the Open Science Grassroots Committee at the Neuro. Prof. Stratton was trained at the University of Melbourne (PhD) and the University of Calgary (postdoctoral fellowship). As an independent researcher, her goal now is to elucidate the complex neuro-immune interactions implicated in MS by using single cell technologies, animal modelling, in vitro assays and human samples. She is considered a rising leader in the field of ependymal cell biology, a critically understudied glia cell important for maintaining cerebrospinal fluid flow and brain homeostasis, and her goal is to understand how these cells are involved in disease pathogenesis.
Christine Tardif, PhD

Christine Tardif is an Assistant Professor of Neurology & Neurosurgery and Biomedical Engineering at McGill University since 2017. She is the co-director of the MRI Unit at the McConnell Brain Imaging Centre, as well as co-director of the Quebec Bio-Imaging Network. Prof. Tardif’s lab develops MRI techniques to generate high-resolution, quantitative images of the brain in-vivo, and relates them to microstructural features of the tissue. The lab has a translational approach, working on both small animal and human MRI systems.

Stephanie Zandee, PhD

Stephanie Zandee obtained a BSc in Molecular Life Sciences and a MSc in Molecular Mechanisms of Disease at the Radboud University Nijmegen (The Netherlands). She moved to the University of Edinburgh to carry out a PhD in the labs of Dr. Stephen Anderton and Dr. Anna Williams, focusing on regulatory T cells (Treg) in Multiple Sclerosis pathology. She continued her research in the lab of Dr. Alexandre Prat at the CRCHUM in Montreal, where she investigated the blood-brain barrier in MS. Prof. Zandee has been extensively trained in MS neuropathology and coordinated the Prat lab brain bank and autopsy program for 8 years. Prof. Zandee is starting her own research group at The Neuro, McGill University, as of June 2024. The Zandee lab will focus on understanding MS lesion pathology at a single cell level, with a specific focus on the role of the anti-inflammatory cytokine IL-37.

Robert Zatorre, PhD

Robert Zatorre was born and raised in Buenos Aires, Argentina. After studying psychology and music in the USA, he carried out postdoctoral work with Brenda Milner at The Neuro, where he currently holds a Canada Research Chair in Auditory Cognitive Neuroscience. His laboratory studies the neural substrates of auditory cognition with special emphasis on two characteristically human abilities: speech and music. In 2006 he co-founded the international laboratory for Brain, Music, and Sound research, which has received >$20M in funding. He has received numerous international prizes: including the neuronal plasticity prize from the IPSEN foundation, the deCarvalho-Heineken prize in cognitive science (Amsterdam), and the Grand Prix Scientifique from the Institut pour l’Audition (Paris). His book “From Perception to Pleasure: The Neuroscience of Music and Why We Love It” was published by Oxford University Press in 2023.
Integration of Research and Clinic - Open Single Cell Overview

Jo Anne Stratton

This presentation will focus on describing the single cell ecosystem at McGill, and focus on open science activities in this context.

Discovery of Tumorigenic Mechanisms and Therapeutic Targets in Diffuse Gliomas

Jerome Fortin

Diffuse gliomas, the most common cancers of the central nervous system, are characterized by their infiltrative behavior and resistance to therapy. We seek to understand how these tumors arise, progress, and could be treated. To do so, we generate and analyze mouse models of diffuse gliomas that carry mutations seen in the corresponding human disease. Using tumor cells from mice and humans, we use functional genomics to identify and characterize therapeutic targets. In ongoing studies, we are using a new mouse model of IDH mutated diffuse gliomas, to discover molecules that control tumor cell sensitivity to IDH inhibitors that have recently shown promising, but variable anti-tumor efficacy in the clinic.

Understanding Multiple Sclerosis Lesion Pathology at a Single Cell Level

Stephanie Zandee

Multiple Sclerosis (MS) is an autoimmune demyelinating and neurodegenerative disease of the central nervous system (CNS) affecting an estimated 97,300 Canadians. MS is likely initiated by the migration of multiple immune cell subsets from the blood across the blood brain barrier (BBB), leading to CNS lesion formation. Currently it is unclear how lesions evolve or what determines the location and timing of lesion formation (heterogenous in space and time). Thus far, there are no methods to predict lesion evolution accurately and it is unclear if what happens in the peripheral blood is an adequate representation of the processes happening in the CNS. A fuller understanding of the processes that control the inflammatory lesions in the CNS has the long-term potential to be used to patient benefit. In this respect IL-37 is an interesting candidate as it is a novel anti-inflammatory cytokine, which has been shown to play an important role in dampening down both innate and acquired immunity. A complex of IL-18Ra and IL1-R8 (SigIRR) is required for IL-37 signalling, infection or inflammation can increase IL-37 levels, which is thought to be important to limit disease severity. Recently, IL-37 has been shown to have a beneficial effect in spinal cord injury in rodent models which was attributed to a reduced influx of pathogenic immune cells and an increase in regulatory immune subsets. Thus far the role of IL-37 signalling in the CNS remains unknown, but could hold potential for new treatments in CNS autoimmune diseases such as MS. In this talk previous work and preliminary data in support of the Zandee’s lab mission will be discussed. The Zandee lab has the overarching goal of understanding MS lesion evolution (formation, destruction, repair) at the transcriptomic and proteomic level using single cell approaches and artificial intelligence, namely machine learning (ML) methods. Secondary, the Zandee lab will zoom in specifically on the role of the anti-inflammatory cytokine IL-37 in human brain homeostasis and inflammation in the context of MS.

Overview of the Tanenbaum Open Science Institute Initiatives to Support The Neuro Community

Gabriel Pelletier and Luisa Pimentel

The Tanenbaum Open Science Institute will provide an update on current programs and initiatives available to Neuro researchers, staff and trainees designed to help them implement Open Science practices. We will also provide an overview of Open Science events and opportunities for the Neuro community to collaborate with each other, learn about Open Science, and contribute to shaping how The Neuro implements its Open Science principles.

Building Next Gen Brain Imaging Tools for Population Neuroscience and Global Health

Udunna Anazodo

The quest to understand how our mind work and its shortcomings by linking the mind to the brain, is a longstanding open neuroscience question. From the ancient Greeks’ (Aristotle, Plato, and Galen) philosophical views on mind-body connections, to Franz Joseph Gall’s phrenology maps, to René Descartes’ attempt at describing the pineal gland as the center of the soul, there is a longstanding attempt to map mental functions onto the brain as well as the body, to then predict mental traits/disorders, at the population level. With the advent of in vivo imaging tools, particularly the introduction of high-resolution PET scanners twenty years ago, the recent integration of PET and MRI, and the increased proliferation of PET probes, we are now much closer to mapping mind health to fundamental biomechanisms of the brain and their interactions with the body and our environment. This talk will highlight emerging PET and MRI tools developed by my group to map synergistic interactions of key drivers of pathological cognitive aging in brains of live humans at the population level. Early work exploring PET and MRI methods for studying brain function, metabolism and neurochemistry in longitudinal and large cohort studies will be showcased and efforts to make these imaging methods widely accessible through open science and capacity building will be highlighted.

Strategies to Maintain Access to Patient Care Amidst Human Resources Challenges

Georgia Niarchos

Today’s Healthcare administrators are faced with the challenges of a huge lack of human resources. Healthcare professional gaps, have led to decreased ability to provide patients with efficient access to Operating Rooms, Interventional platforms, and tests, and has led to increased wait times for patients in Emergency rooms, and a significant number of bed closures across the province of Quebec. The current reality has mobilized Healthcare administrators to find innovative solutions to deal with the current manpower crisis. This presentation will highlight strategies put in place at The Neuro that aim to protect the quality and access of care to our Neuro patient population.

Enhanced Recovery After Surgery for Malignant Brain Tumours

Roberto Diaz and Heather Perkins

A multidisciplinary enhanced recovery after surgery program (ERAS) was developed at The Neuro. The protocol is to be applied in the beginning of 2024 with the aim of shortening length of stay and reducing post-operative complications. The background, development, and implementation of the ERAS program for malignant brain tumor surgery will be described. We will present pre-intervention and post-intervention outcome measures to assess the impact of this quality improvement program.
The McConnell Brain Imaging Centre Celebrates Its 40th Anniversary

Julien Doyon

Founded by Dr. William Feindel in 1984, the McConnell Brain Imaging Centre (BIC) at The Neuro is one-of-a-kind multidisciplinary, research-dedicated, neuroimaging and neuroinformatic center internationally recognized for its technical and methodological advances in the acquisition and analysis of multimodal imaging data, as well as for its seminal discoveries related to structural, functional and molecular mechanisms of the healthy and diseased brain. In this short presentation, I will be sharing some of the milestones that have shaped this pioneering centre in the last 40 years.

Quantitative MRI in Humans and Marmosets

Christine Tardif

Quantitative magnetic resonance imaging provide information about the microstructure and composition of brain tissue in vivo. These non-invasive tools are increasingly used in human neuroimaging research and are gaining traction in animal studies to identify translational biomarkers. I will present some recent MRI tools developed at the McConnell Brain Imaging Centre to support high-resolution quantitative MRI of the human and marmoset brain.

Transforming Spine Specialist Wait Times: Transitioning from Paper Forms to an AI-Enabled Application

Carlo Santaguida

Quantitative magnetic resonance imaging provide information about the microstructure and composition of brain tissue in vivo. These non-invasive tools are increasingly used in human neuroimaging research and are gaining traction in animal studies to identify translational biomarkers. I will present some recent MRI tools developed at the McConnell Brain Imaging Centre to support high-resolution quantitative MRI of the human and marmoset brain.

Using AI to Support Treatment Decisions in MS

Douglas Arnold

Use of AI to support treatment decisions in the MS clinic depends on individual prediction of disease evolution and response to treatment. This has not been possible up to now. AI is making progress in achieving these goals, but the problem is not solved. Much work remains to be done to solve methodological challenges in AI, particularly with respect to analysis of medical images.

Helmholtz International BigBrain Analytics & Learning Laboratory (HIBALL)

Alan Evans

HIBALL is a collaboration between McGill and the Juelich Forschungzentrum, arising from a longstanding collaboration between the labs of Alan Evans and Katrin Amunts around the BigBrain, a 3D whole brain histology map at 50 micron resolution. Combining BigBrain cortical layer maps with 3D neuroreceptor maps and EEG, HIBALL uses AI to model brain network architecture. Since its launch in 2021, HIBALL has produced over 60 publications and now includes 400 scientists worldwide.

AI: The Next Frontier in Surgical Education

Rolando Del Maestro

In procedural-based medicine, the technical ability can be a critical determinant of patient outcomes. Psychomotor performance occurs in real-time, hence a continuous assessment is necessary to provide action-oriented feedback and error avoidance guidance. We have developed a deep learning application, the Intelligent Continuous Expertise Monitoring System (ICEMS), to assess surgical bimanual performance at 0.2-s intervals. A long-short term memory network was built using neurosurgeon and student performance in 156 virtually simulated tumor resection tasks. Algorithm predictive ability was tested separately on 144 procedures by scoring the performance of neurosurgical trainees who are at different training stages. To test the efficacy of the ICEMS in surgical education we carried out two randomized clinical trials, the first comparing a intelligent tutor called the Virtual Operative Assistant and off-site learning of surgical simulation, and the second to assess the utility of personalized AI-powered learner feedback and error detection along with error avoidance using the ICEMS platform compared to in person expert instructors. These two randomized clinical trials have demonstrated the efficacy of these intelligent tutoring platforms compared to expert instructors. Artificial intelligence may facilitate trainee learning by providing equally or more efficient learning when compared to human instruction. These systems may aid in developing competency-based standardized curricula in surgical training.
Enhancing the Applied Impact of Cognitive Neuroscience: Early Lessons From a Novel Research Development Paradigm

Madeleine Sharp

The CONNECT project (COgnitive Neuroscience kNowledge Exchange for Clinical Translation) aimed to implement a suite of processes to enhance collaboration, promote interdisciplinary knowledge exchange and orient cognitive neuroscience research towards real world applications. In this talk I will discuss the outcomes and lessons learned from three funding and research development cycles in which we experimented with different approaches, including design thinking, end user engagement, and promotion of early collaborations, that were aimed at supporting cognitive neuroscientists in the creation of new knowledge that is informed by its eventual application.

Predictability Over Uncertainty: A Decision-Making Bias Related to Locus Coeruleus Integrity in Older Adulthood

Nathan Spreng

Optimal decision-making balances exploration for new information against exploitation of known rewards, a process mediated by the locus coeruleus and its norepinephrine projections. We predicted that an exploitation-bias that emerges in older adulthood would be associated with lower microstructural integrity of the locus coeruleus. Leveraging in vivo methods from quantitative MRI -magnetic transfer saturation- we provide evidence that older age is associated with lower locus coeruleus integrity. Critically, we demonstrate that an exploitation bias in older adulthood, assessed with a foraging task, is sensitive and specific to lower locus coeruleus integrity. Because the locus coeruleus is uniquely vulnerable to Alzheimer’s disease pathology, our findings suggest that aging, and a pre-symptomatic trajectory of Alzheimer’s related decline, may fundamentally alter decision-making abilities in later life prior to the onset of clinical impairment. Recent discoveries and new directions for inquiry will be discussed.

Inducing Neural Plasticity in Auditory Circuits Via Brain Stimulation, Training, and Sensory Input

Robert Zatorre

Brain plasticity is usually invoked to explain experience-dependent changes in neural organization. But plasticity can also be induced and/or potentiated by direct brain stimulation techniques such as transcranial magnetic stimulation (TMS). In our lab we have identified a dorsal auditory pathway that is involved in auditory musical processes, including transformations and manipulation of elements in working memory. This pathway comprises posterior auditory cortical regions, the intraparietal sulcus, and the dorsal premotor cortex. Its recruitment is linked to individual differences in task performance, and also related to neural oscillations in the theta (~5Hz) range. Our team has shown that rhythmic (but not arhythmic) TMS of the parietal region at that frequency results in greater activity in the entire pathway, and in enhanced task performance. Preliminary evidence from a longitudinal study suggests that such enhancement could be made to last over long periods. Recently, we have also shown that oscillations within the dorsal auditory pathway can be driven by visual stimuli that engage the same system (rotating shapes), and that when presented at a theta frequency they result in enhanced auditory working memory. These results support the idea that brain plasticity can be induced or promoted by targeting the relevant pathway with the correct oscillatory frequency, and that it can be accomplished both via direct brain stimulation and also via sensory stimulation, leading to novel insights on the mechanisms of function, as well as possible applications.

Dorsomedial Frontal Cortex Damage Impairs Error-Based, but Not Reinforcement-Based Motor Learning in Humans

Dimitrios Palidis

We adapt our movements to new and changing environments through multiple processes. Sensory error-based learning counteracts environmental perturbations that affect the sensory consequences of movements. Reinforcement-based learning enhances the selection of movements that produce rewarding outcomes. Although some findings have identified dissociable neural substrates of sensory error- and reinforcement-based learning, correlational methods have implicated dorsomedial frontal cortex in both. Here, we tested the causal contributions of dorsomedial frontal to adaptive motor control, studying people with chronic damage to this region. Seven human participants with focal brain lesions affecting the dorsomedial frontal and 20 controls performed a battery of arm movement tasks designed to test error- and reinforcement-based motor learning. Dorsomedial frontal lesions impaired the early stages of force field adaptation, but did not affect any other measures. These results provide evidence for a specific and selective causal role for the dorsomedial frontal in sensory error-based learning.

A Comparative Definition of the Ventral Frontal-Temporal-Occipital White Matter Pathways in the Monkey and Human Brain

Kep Kee Loh

In the human and the macaque monkey brain, the cross-talk between the frontal, temporal and occipital regions of the cerebral cortex is crucial for the high-level regulation of behaviors based on previously stored and current incoming perceptual information. In this work, we provide a comparative definition of the major 'ventral' white matter fasciculi or bundles that interconnect the frontal cortex and the temporal and occipital cortex in the human and monkey brain: the Uncinate Fasciculus, the Frontal-Temporal Extreme Capsule Fasciculus, and the Frontal-Occipital Extreme Capsule Fasciculus. We first performed a careful review of existing tract-tracing studies in the macaque monkey to elucidate the monosynaptic connections that link the frontal, temporal and occipital regions through the ventral pathway (i.e. the connections that run beneath the insula). Next, based on cortical homologies between the human and macaque monkey brain, we defined various cortical ROIs in the human brain that corresponded to the terminations of the various frontal-temporal-occipital monosynaptic connections observed in the monkey. Finally, using these homologous ROIs, we reconstructed the Uncinate Fasciculus, Frontal-Temporal Extreme Capsule Fasciculus and the Frontal-Occipital Extreme Capsule Fasciculus in the human brain using diffusion-weighted MRI tractography. By providing a comparative definition of the frontal-temporal-occipital pathways in the human and monkey brain, this work will be useful in bridging functional studies relating to the frontal and temporal-occipital regions across the two species.
NEURO TRIVIA GAME

**Date:** Friday, June 7  
**Time:** 19:00  
**Location:** La Tablée

Answer as many Neuro trivia questions as you can with your group. There will be a 15 minute time limit for deliberations. Will yours be the winning team?

TEAM BUILDING ACTIVITY

**Date:** Saturday, June 8  
**Time:** 11:30 - 12:15  
**Location:** Everest A

Join your colleagues in a series of dynamic activities that will test your problem-solving skills, creativity, and ability to work together.

WRITING WORKSHOP

**Date:** Saturday, June 8  
**Time:** 16:15-17:00  
**Location:** Edelweiss A

Join Montreal kids’ book author Monique Polak at this writing workshop. Monique will speak briefly about her latest book *Remember This: The Fascinating World of Memory* (Orca Books), and share some of the writing tips that work for her. The workshop will include a writing (or drawing) exercise that will allow participants of all ages to use a memory as a source for creative inspiration.

Monique Polak is a prize-winning author who has published 34 books for young people. In addition to being an active freelance journalist, she had a long and happy career teaching English and Humanities at Marianopolis College. Monique continues to do writing workshops at schools across the province.

GAMES NIGHT

**Date:** Saturday, June 8  
**Time:** 21:00  
**Location:** Everest A

Join your colleagues for poker, card games, and more!
**RUN**

**Date:** Saturday, June 8  
**Time:** Departure at 7:45  
**Location:** Departure from lobby

Experience a 45-minute scenic run, tailored for intermediate to experienced runners.

**HIKE**

**Date:** Saturday, June 8  
**Time:** Departure at 13:30  
**Location:** Departure from lobby

The trails are accessible at walking distance from the hotel. Moderate level guided hike, approximately 3 hours in length.

Hike Guide: Matt Fisher

**ART EXPERIENCE**

**Date:** Saturday, June 8  
**Time:** 13:30 - 16:00  
**Location:** Edelweiss A

Painting for all levels. Create an original artwork. Materials supplied by The Neuro.

**YOGA**

**Date:** Sunday, June 9  
**Time:** 8:00  
**Location:** Edelweiss A

Yoga for all levels, no experience required! Yoga mats will be provided. Comfortable clothing is recommended. Cost is $20, payable in advance.
Born in Pointe-Gatineau in 1969, Sébastien Moreau is the second of three children. Admirer of his mother, who is a painter, he is captivated by art at a very young age. In 1994, he obtains his Bachelor of Fine Arts at Mount Allison University, located in Sackville, New Brunswick. As he is also passionate about sports, he dedicates part of his life to the field of football. Father of three, he continues to create zany artwork to lighten the daily routine. Winner of several awards, he has exposed his art for about twenty years in art galleries, and his artwork is part of private and public collections. His art is increasingly receiving recognition and his desire to live off it is well-anchored in the present.

Carolina Echeverría is a feminist activist, visual artist, cultural mediator, and artistic director of Chilean origin. Her artistic practice has focused on immigration for the past 35 years, and her works have been exhibited and collected internationally in various museums, art galleries, private collections and art fairs. She is the founder and former Artistic Director of the Native Immigrant organization and art gallery. Recently, Echeverría curated an exhibition at the Ecomusée du Fier Monde, which became the most visited exhibition in the museum's history. In addition to her curatorial work, Echeverría is also a founder and member of the Colectiva Crear Poder Popular. Currently, Echeverría serves as the artistic director for the exhibition "Créer le Pouvoir Populaire" at the POP Museum in Trois-Rivières, QC. Her works can be seen at her Atelier Carolina Echeverría in the Belgo Building.

We Are Stardust
Valued at $2500

Our Hidden Beauty
Valued at $1200

Josefina Maranzano was born in Buenos Aires, Argentina, where she worked as an MD in Internal Medicine and Radiology. She completed a PhD in Neurosciences at McGill University and is currently working as a Professor at the Université du Québec à Trois-Rivières. It was in Quebec that Dr. Maranzano developed a passion for the visual arts and has become an accomplished artist. As a dual professional, she has used images of human brains and neurons to create projects that present the beauty of the human structure, common to us all. This art piece, donated to the Neuro, is part of a new project, called “Our hidden beauty”. The project presents different human proteins, illustrated in their secondary, tertiary and quaternary structures, through a collage of papers previously hand-painted with acrylic paint. These artistic, colourful proteins reflect the growing structural complexity of real human proteins. Through this project, the artist wishes to share with the public the structural human beauty that we all share.

1420 Crescent
Valued at $1450
RAFFLE PRIZES

PACKAGE FOR 2 PEOPLE AT MANOIR SAINT SAUVEUR, INCLUDES BREAKFAST
$425

SCHWARTZ’S DELI GIFT CERTIFICATE
$50

DINNER FOR 2 – BORD’ELLE BOUTIQUE BAR & EATERY
$250

DINNER FOR 2 – PANGEA RESTAURANT AND BAR
$250

NEURON ARTWORK
$300
Courtesy of Neurowoodworks by LJ Pilaz

BRAIN ARTWORK
$150
Courtesy of Neurowoodworks by LJ Pilaz

AMAZON GIFT CARD
$50
Courtesy of AVI-SPL

WONDERBOOM 3 SPEAKER
$100
Courtesy of Applied Electronics

POLY WEBCAM
$100
Courtesy of AVI-SPL
EARLY DINNER | EDELWEISS A

Friday, June 7 (18:00 to 18:30)
Saturday, June 8 (18:15 to 18:45)

Note: Advance sign up required

CHILDCARE ROOM | EDELWEISS A

Saturday, June 8 (9:00 to 11:30)
Sunday, June 9 (9:00 to 11:30)

FAMILY TEAM BUILDING | EDELWEISS B

Saturday, June 8 (16:30 to 17:00)

CHILDREN’S CORNER | EVEREST A

Saturday, June 8 (21:00)
**ART GALLERIES**
Saint-Sauveur’s Rue Principale stands out for its renowned art galleries. Discover a rich collection of artworks by renowned Quebec artists, showcasing a diverse range of captivating themes! Rue Principale is a brief walk from Manoir Saint-Sauveur.

**TYROPARC**
Embark on an exhilarating journey through the forest, soaring 100 meters above ground, traversing from one side of Mont Catherine to the other via two expansive ziplines, all under the guidance of certified experts. A guaranteed adrenaline rush awaits!

**S’MORES ACTIVITY**
Enjoy making s’mores in front of a private outdoor fireplace. Reservation needs to be done at least 2h prior to the activity. Reservations booked via Manoir Saint-Sauveur.

**PARC AQUATIQUE**
Just a 10-minute drive from Manoir Saint-Sauveur, the Parc Aquatique offers an exhilarating aquatic escape for all ages. Dive into a world of thrilling water slides, lazy rivers, and interactive water features designed to ignite excitement and create lasting memories.

**MSS BIKE PARK**
MSS Bike Park on Versant Avila creates an experience tailored for both novice riders and seasoned professionals. With meticulously designed trails, ramps, and terrains, the park offers an adrenaline-fueled adventure against the stunning backdrop of Saint-Sauveur.

**MINIGOLF**
Explore Parc F.U.N. and its miniature golf course. The 18 holes of varying difficulty will put your skills to the test!

**MORE IDEAS**
- Schedule a wine tasting tour
- Book a spa experience
- Visit a local ice cream shop
- Go shopping at nearby outlet stores
- Explore new hiking trails in Saint-Sauveur
- Go horseback riding
For more information, inquiries, or assistance, please contact:

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