OPEN SCIENCE: TOWARDS THE NEW NORMAL

An event organized by the Tanenbaum Open Science Institute
In person at The Neuro and livestreamed online

November 30, 2023
The Neuro, 3801 University Street | Jeanne Timmins Amphitheatre

Program Booklet
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The Open Science in Action Symposium 2023

The 2023 Open Science in Action symposium will focus on how Open Science is becoming the New Normal in research, featuring speakers from leading international and local initiatives.

The morning session features a keynote lecture by Vincent Larivière, the first UNESCO chair in Open Science, who will provide a birds-eye perspective on how Open Science is a burgeoning research field.

The following panel discussion reflects on how Open Science, artificial intelligence, and experimental verification are providing the model for the future of drug discovery. The panel will be moderated by Viviane Poupon, CEO of Brain Canada, and feature leaders from well-established organizations like the Michael J. Fox Foundation and Molecular Forecaster, and the newly announced Conscience initiative.

Open Science Prize Ceremony

The morning will conclude with the 2023 Neuro-Irv and Helga Cooper Foundation Open Science Prizes Ceremony. The winners of this premier OS competition will accept their awards and present their work. Symposium attendees are then invited to join a celebratory lunch.

Open Science in Action at The Neuro

The afternoon will feature rounds of engaging flash talks that demonstrate how Open Science practices have become integral to a growing number of labs and initiatives at The Neuro, spanning the entire research life-cycle, including sharing data, software, methods and engaging in science outreach and education. The day concludes with a cocktail reception to network and connect with the community.
Program

9:00  Opening Remarks

Annabel Seyller
CEO, Tanenbaum Open Science Institute
Chief of Staff, The Neuro

Guy Rouleau
Director, The Neuro
Co-founder, Tanenbaum Open Science Institute

Christopher Buddle
Associate Provost (Teaching and Academic Planning)
McGill University

David Rotenberg
Director of Data Strategy & Business Intelligence at The Centre for Addiction and Mental Health

9:15  Keynote Lecture – Open Science: Challenges and Opportunities

Vincent Larivière
Inaugural UNESCO Chair in Open Science, Professor of information science at the École de bibliothéconomie et des sciences de l’information, Université de Montréal

10:00 Panel Discussion

Open Science as a driver of new drug discovery models

Moderator: Viviane Poupon, President and CEO Brain Canada

Ryan Merkley
CEO Conscience
Brian Fiske
Co-Chief Scientific Officer, The Michael J. Fox Foundation for Parkinson's Research

Suneel Kumar BVS
Director, Drug Design, Molecular Forecaster

10:45
Refreshment Pause

11:15
The Neuro-IRV and Helga Cooper Foundation
Open Science Prizes Ceremony

Chaired by:
Thomas Durcan
Associate Professor, McGill University, The Neuro
Justine Hansen
PhD Candidate, McGill University, The Neuro

Main International Prize Winner
The Brain Imaging Data Structure (BIDS)
Represented by
Yaroslav Halchenko
Research Associate Professor, Dartmouth College

International Trainee Prize Winner
Maruf Adewole
PhD Candidate, University of Lagos

Canadian Trainee Prize Winner
Hao-Ting Wang
Postdoctoral researcher, CRIUHM, Université de Montréal
12:35  Concluding Remarks
Annabel Seyller
CEO, Tanenbaum Open Science Institute,
Chief of Staff, The Neuro

12:40  Lunch
Lunch provided onsite
Interactive activities, Open Science Trivia, and more!

1:30  Session 1: Data and Knowledge Sharing Initiatives
Accelerating Research and Care
Moderator: Gabriel Pelletier, Open Science Data Manager, Tanenbaum Open Science Institute (TOSI)

Ruwan Bedeir
MSc Candidate, McGill University
The White Matter Rounds Initiative

Nikhil Bhagwat
Academic Associate, McGill University, The Neuro
Parkcore: A Collaborative Research Initiative to Facilitate Reproducible and Open Science in Global Parkinson’s Disease (PD) Studies

Harrison Aduluwa
MSc. Candidate, McGill University, The Neuro
Establishing Sustainable Capacity for Neuroimaging Science in Africa

Jason Karamchandani
Associate Professor, McGill University, The Neuro
Technical Innovations in Open Science: The C-BIG Repository and Patient Registry
Session 2: Open-Source Software Enabling Neuroscience Research

Moderator: Jean-Baptiste Poline, Associate Professor, McGill University, The Neuro

Adrien Peyrache
Associate Professor, McGill University, The Neuro
Pynapple: Open-Source Python Library for Neurophysiological Data Analysis

Jessica Royer & Raul Rodriguez Cruces
PhD Candidates, McGill University, The Neuro
Open Data and Methods for Studies of Multiscale Brain Organization

Amir Shmuel
Professor, McGill University, The Neuro
Using Deep Learning for Detecting Artifacts in Structural Magnetic Resonance Images

Judith Lacoste
Founding President and Scientific Director, MIA CELLAVIE Inc.
Canada Bioimaging National Omero Image Data Resource

3:30 Refreshment Pause
Session 3: Science Outreach, Science Communication and Patient Engagement

Moderator: Linda Lafontaine, Patient, Hereditary Spastic Paraplegia (HSP)

Hilary Sweatman
PhD Candidate, McGill University, The Neuro
NeuroLingo: Training The Next Generation of Science Communicators

Cindy Hovington
Founder, Curious Neuron
Making Parental Mental Health Research Accessible to All Parents

Kendra Oudyk
PhD Candidate, McGill University, The Neuro
Open Science Office Hours

Stuart Trenholm
Associate Professor, McGill University, The Neuro
The Open Brain - A New Kind of ‘Textbook’

Concluding Remarks

Annabel Seyller
CEO, Tanenbaum Open Science Institute, Chief of Staff, The Neuro

Cocktail Reception and Networking
The Brain Imaging Data Structure (BIDS, www.bids-standard.org) is a community-led standard for organizing, describing and sharing neuroimaging data. In addition to a specification document which describes the standard, it includes applications and tools that make it easy for researchers to incorporate the standard into their current workflows, maximizing reproducibility, data sharing opportunities and supporting good scientific practices.

The Brain Imaging Data Structure (BIDS), a Data Standard to Support the Global Neuroimaging Community

BIDS Steering Committee:

Ariel Rokem, University of Washington
Cyril Pernet, Copenhagen University Hospital, Rigshospitalet
Guiomar Niso, Head of Neuroimaging at the Cajal Institute of the Spanish National Research Council (CSIC)
Yaroslav Halchenko, Dartmouth University
Robert Oostenveld, Donders Institute for Brain, Cognition and Behaviour

Data from neuroimaging experiments can be arranged in many different ways, but in the absence of a standard, they are organized differently between institutions and even within a lab. This leads to misunderstandings and errors, as well as inefficient use of resources. In addition, it results in poor reproducibility even within the lab where data were collected. The Brain Imaging Data Structure (BIDS) addresses these challenges through a simple, easy-to-adopt way to organize neuroimaging data. BIDS is a community-led standard for organizing, describing and sharing neuroimaging data. In addition to a specification document which describes the standard, it includes applications and tools that make it easy for researchers to incorporate the standard into their current workflows, maximizing reproducibility, data sharing opportunities and supporting good scientific practices. By removing barriers to data sharing, BIDS is enabling a plethora of projects that rely on open-source data around the world.
International Trainee Prize winner

Maruf Adewole

Maruf Adewole is a PhD Candidate at the University of Lagos and the Lab Manager at the Medical Artificial Intelligence Laboratory (MAI Lab) based in Lagos, Nigeria. His work on Expanding BraTS to Capture African populations led to the creation of the BraTS-SSA dataset. The dataset consists of T1, T2, T1CE, and FLAIR scans of 95 patients of African descent diagnosed with Glioma. This dataset opens the ground for advanced neuroimaging research in the region. The dataset has already been put to good use, being used for organizing the 2023 Brain Tumour Segmentation Challenge (BraTS) and for training young Africans in medical image computing through the Sprint AI Training for African Medical Imaging Knowledge Translation (SPARK) Academy. The data is available for free on Synapse.

The Brain Tumour Segmentation Challenge for Sub-Saharan Africa

The Brain Tumour Segmentation (BraTS) Challenge has been running for more than a decade but has never featured data from underserved region such as Sub-Saharan Africa (SSA). In June 2023, we released the BraTS-SSA, a magnetic resonance imaging (MRI) dataset of brain tumour cases from Sub-Saharan Africa. This project provided the opportunity to include SSA population in global efforts to create artificial intelligence tools to improve brain tumour detection and treatment planning. By aggregating and curating a diverse dataset from African diagnostics centers, it has provided researchers with a valuable resource to better understand the unique aspects of brain tumours in African populations. This dataset has the power to enhance diagnostic accuracy, treatment planning, and therapeutic outcomes, ultimately improving the quality of care for patients in Africa and other resource-constrained environments whose peculiarities mirrors Africa.
Hao-Ting Wang is a postdoctoral researcher at the Centre de recherche de l’institut universitaire de gériatrie de Montréal (CRIUGM). In 2022, she was awarded a fellowship from the Institut de valorisation des données (IVADO) to focus on biomarker discovery using deep learning methods. Her current work revolves around integrating a wide array of clinical datasets to enhance clinical predictions, with the aim of understanding the common brain features of these conditions.

Continuous Evaluation of Denoising Strategies in Resting-State fMRI Connectivity Using fMRIPrep and Nilearn

This project presents a new denoising benchmark for functional MRI data that can be repeatedly executed for users of the popular open preprocessing software fMRIPrep. This benchmark introduces the first denoising assessment of connectomes using a contemporary software framework. It boasts an open workflow, from dataset to software implementation. Notably, the project prioritizes the software's lifecycle and community benefits over individual authorship, exemplified by the incorporation into the existing, open, and widely used software library Nilearn, rather than creating a separate software package. With the aim of furnishing guidance to the fMRIPrep user community and underscoring the significance of ongoing research method evaluation, this work lays the groundwork for a reproducible research infrastructure. The preprint published on the Neurolibre Preprint Service facilitates future continuous assessment and demonstrates the potential of Neurolibre’s applications to reproducible research. The benchmark project further served as prototypes of Brain Imaging Data Structure applications (BIDS-App) for generating machine-learning-ready time series and connectomes.
Speakers & Moderators

Harrison Aduluwa

Harrison Aduluwa, formerly the Lead Radiographer at one of Nigeria's foremost health institutions, Euracare Multispecialist Hospital, has an extensive background in the field. With prior experience as the senior radiographer at General Hospital Lagos, Harrison holds a bachelor's degree in Radiography and Radiological Science from the University of Calabar, Nigeria. Additionally, he earned a Master of Public Health degree from Babcock University, Nigeria. Currently, Harrison is pursuing his MSc in Neuroscience at McGill University in Canada.

Ruhan Bedeir

Ruhan Bedeir is a dedicated Master's candidate with two years of experience in neuroscience research. She holds a B.Sc. Honours Specialization in Genetics from Western University and works at the White Lab. Ruwan's primary research goal is to uncover the genetic factors behind white matter diseases, with a focus on developing targeted genetic therapies. She is actively involved in projects that aim to differentiate between multiple sclerosis and similar conditions, investigate phenotypes and MR imaging in hereditary spastic paraplegia, and contribute to the White Matter Rounds network. Her overarching mission is to make neuroscience more accessible to the public and advance our understanding of these complex conditions.

Nikhil Bhagwat

Nikhil Bhagwat is an Academic Associate working with Dr. Jean-Baptiste Poline in the ORIGAMI lab. He has a keen interest in the development of reliable biomarkers and machine-learning models for prognosis in neurodegenerative diseases. Nikhil completed his PhD thesis on prognostic applications for Alzheimer's disease using MR imaging and machine-learning under the guidance of Dr. Mallar Chakravarty at the University of Toronto. Subsequently, he worked as a scientist at UMass and the Allen Institute, where he was involved in projects related to reproducibility analysis, network spread modeling, and deep-learning based segmentation. His current projects are centered around the development of neuroinformatic tools and reproducible computational workflows for standardized curation and processing of large datasets.

Raul R. Cruces

Raul obtained his MD with Laurate distinction, and graduated with honors from the PhD program in Biomedical science at the National Autonomous University of Mexico where he worked in the field of epilepsy and cognition. He is currently a postdoctoral researcher at the MICA Lab of the BIC, McGill University. His current work focuses on optimizing MRI preprocessing workflows, advocating for open data sharing practices, and developing multiparametric modeling approaches to better comprehend the intricate interactions within structural and functional brain networks in both healthy and disease.
Brian Fiske

Brian Fiske (he/him), PhD, is Co-Chief Scientific Officer at The Michael J. Fox Foundation for Parkinson’s Research where he supports the development and stewardship of the Foundation’s innovative strategic vision for accelerating research and drug development for Parkinson’s disease. Brian earned his undergraduate degree in biology from Texas A&M University and a PhD in Neuroscience from the University of Virginia. After completing postdoctoral research at Columbia University, Brian spent several years as an editor for the scientific journal, Nature Neuroscience, before joining the Foundation in 2004 to help bring new treatments to people living with Parkinson’s disease.

Cindy Hovington

Cindy Hovington is the founder of Curious Neuron and Co-Founder of Wondergrade. She has a doctorate in neuroscience and shares the research around parental emotional and mental health and brain development in kids through Curious Neuron. She creates tools to help parents support their child’s emotional development through Wondergrade. Her work and speaking engagements focus on educating parents about their emotional health and helping them create the best possible early environment for their kids. She has worked with large brands like Airbnb, Pampers and Dialogue. She has an Instagram following of 141,000 followers and a top parenting podcast in Canada, the US and the UK and has been cited in media across the globe.

Jason Karamchandani

Jason Karamchandani is a neuropathologist at the Neuro. He is an Associate Professor in the departments of Pathology and Neurology. He serves as the director of the Neuro’s Open Science combined patient registry and bio-repository: C-BIG.

Suneel Kumar BVS

Suneel Kumar is currently serving as the esteemed Director of Drug Design at Molecular Forecaster. With a 18-year career in computational chemistry, he has been a part of multiple clinical candidate discovery and development projects. He is actively employing advanced AI and Computational Chemistry techniques to engineer novel and potent compounds for diverse therapeutic targets and indications. Suneel Kumar is highly skilled in structure and ligand-based drug design, and deep learning. His scholarly contributions are well-recognized, having published multiple papers in reputable peer-reviewed journals.
Judith Lacoste

Judith Lacoste has been running a small business named Microscopy, Imaging and Analysis Cellavie for 18 years. The founding vision of MIA Cellavie was that microscopy had to be done in an artefact-free, reproducible and quantitative manner. She used to be a microscopy core facility person at McGill University and is an active member of Canada Biol imaging, Biol imaging North America, and QUAREP-LiMi (Quality Assessment and Reproducibility for Instruments and Images in Light Microscopy). In 2014-2019, MIA Cellavie worked for the Center for Open Science on their Reproducibility Project in Cancer Biology, specifically on the replication study pertaining to confocal microscopy. The conclusion of the project was that insufficient reporting of materials, methods and metadata all contribute to reproducibility issues. Recently, MIA Cellavie has focused on working at all levels of the imaging data life cycle to achieve open, reproducible and F.A.I.R. science.

Linda Lafontaine

I have been living with Hereditary Spastic Paraplegia (HSP) for almost 20 years. I am in a wheelchair now but I tend to live large. I like off-grid camping, going to the gym, riding my recumbent tricycle all over the place. Separately, as a patient the questions and answers I had 20 years ago are pretty much the same as the ones I have now! I am trying to advance research to change that. I want to populate the different pathways of my disease to benefit the entire HSP community and I tend to do that in novel ways - similar to living large in my personal life. And I’m doing all that by using the power of Open Science.

Roberta La Piana

Dr. Roberta La Piana is Assistant Professor in the Department of Neurology and Neurosurgery at the Neuro, and Associate Member of the Department of Diagnostic Radiology at McGill University. Dr. La Piana’s research goals are to identify novel forms of adult genetic leukoencephalopathies and their disease-causing genes by combining neuroimaging analysis with deep clinical phenotyping and next-generation sequencing techniques. Over the years, she has contributed to the MRI pattern definition of several genetic white matter diseases. She’s part of several international research consortia working on hereditary white matter disorders and related conditions. In 2013 Dr. La Piana launched the White Matter Rounds, monthly meetings aimed to discuss atypical white matter diseases cases. Initially held at a local level, these interdisciplinary meetings have grown into an international Network which includes participants from more than 15 centers around the world.

Vincent Larivière

Vincent Larivière is Professor of Information Science at the Université de Montréal, where he also holds the UNESCO Chair on Open Science and serves as Associate Vice-President for Planning and Strategic Communication. He is also scientific director of the Érudit journal platform Érudit, associate scientific director of the Observatoire des sciences et des technologies (OST-UQAM), and regular member of the Centre interuniversitaire de recherche sur la science et la technologie (CIRST).
Ryan Merkley

Ryan Merkley is CEO of Conscience, an emerging biotech non-profit, using AI and collaborative science to address areas of market failure in drug development. He is also the Senior Technology Fellow at the Aspen Institute, working on important issues in artificial intelligence, open source, intellectual property, data and privacy, and information integrity. He is an affiliate of the Harvard Berkman Klein Center for Internet and Society, and the founding chair of the Flickr Foundation. Prior to joining the Aspen Institute, Ryan spent over a decade as a c-suite executive in technology non-profits, including Chief of Staff at the Wikimedia Foundation, five years as CEO at Creative Commons, and Chief Operating Officer at Mozilla.

Kendra Oudyk

Kendra does meta-research in neuroimaging, with a focus on meta-analysis and analytic variability in fMRI. She is also involved in the development of an open ecosystem of tools for doing meta-research. Outside her PhD research, Kendra has been involved in the open science community through teaching at conferences and hackathons, often teaching topics related to meta-analysis and git/GitHub. Kendra brings a unique perspective to open science and meta-research, having worked in various places with a range of research techniques, such as music information retrieval, 3D motion capture, fMRI, and natural language processing. Through these experiences, she has seen how researchers benefit from ongoing support to make their research more open, and this led to her starting the initiative Open Science Office Hours.

Gabriel Pelletier

Gabriel is the Open Science Data Manager with The Tanenbaum Open Science Institute (TOSI) at The Neuro. In this role, he engages with Neuro researchers at all levels to assess data management and sharing needs, identifies Open Science tools and best practices, assists researchers in employing them, and provides Neuro researchers and trainees with one-on-one support in making their work Open, transparent and reproducible. Prior to working with TOSI, Gabriel obtained in PhD in Neuroscience from McGill University, and worked as a Research Associate in the Cognitive Neuroscience Unit at The Neuro.

Adrien Peyrache

Adrien Peyrache, PhD, holds the Canadian Research Chair in Systems Neuroscience at the Montreal Neurological Institute, McGill University. He obtained his PhD at the College de France (Paris) and did his postdoctoral training at New York University. He has made major contributions to the field of memory consolidation and spatial navigation, specifically how population of neurons are organized in relation to behavior. His work was recognized by several awards, including a fellowship from the Human Frontiers Science Program and a K99 award from the NIH. He is an active proponent of Open Science and he has co-chaired of The Neuro – Irv and Helga Cooper Foundation Open Science Prize committee until 2022.
Jean-Baptiste Poline

Jean-Baptiste (JB) Poline is an Associate Professor in the Department of Neurology and Neurosurgery at McGill; the co-Chair of the NeuroHub and of the Technical Steering Committee for the Canadian Open Neuroscience Platform at the Montreal Neurological Institute & Hospital (the Neuro); co-director of the McConnell Brain Imaging Centre informatics, and a Primary Investigator at the Ludmer Centre for Neuroinformatics & Mental Health. Among its early pioneers, Poline is a leading researcher in the fields of functional magnetic resonance imaging (fMRI), imaging genetics research, and the neuroinformatics technologies that make a big-data approach to neuroscience possible. Through his research, he has developed several novel data-analysis techniques in statistical modeling and inference for functional brain imaging (fMRI, PET) with applications to large imaging genetic datasets. He also co-developed the very widely-used fMRI software Statistical Parametric Mapping (SPM).

Viviane Poupon

Viviane Poupon is the president and CEO of Brain Canada, where she is advancing the organization’s mission to enhance our understanding of the brain and its impact on human health. Through her leadership, Brain Canada is making significant strides in accelerating research and driving discovery. With more than one hundred partners, and more than $340 million invested in brain research in the past 25 years, Brain Canada is the leading brain research funder and convenor in Canada. Viviane Poupon is a neuroscientist and a strong advocate for open science and sex and gender-based analysis in research. Her commitment to addressing gaps in the Canadian brain research landscape, including mental health research, platform support and capacity building through early-career funding and talent retention.

Guy Rouleau

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. He received his MD with the distinction Magna Cum Laude in 1980 from the University of Ottawa and conducted his clinical training in Neurology at McGill University from 1980-1985. He went on to pursue a PhD (1989) in Genetics at Harvard University. He returned to Montreal in 1989 to establish his research and clinical career at McGill University, where he remained for 15 years. In 2004 he moved to the University of Montreal where he created the Centre for Excellence in Neuromics and became Director of the Research Centre of the CHU Sainte-Justine. In 2013 he returned to McGill to take up the position of Director of The Neuro.

Jessica Royer

Jessica Royer, Psy.D., is clinical neuropsychologist currently pursuing her Ph.D. studies in the Integrated Program in Neuroscience at McGill University in the groups of Dr. Boris Bernhardt and Dr. Birgit Frauscher. Her research integrates multiple brain imaging modalities, notably magnetic resonance imaging (MRI) as well as intracranial and scalp-electroencephalography (EEG), to better understand structural and functional brain organization in healthy individuals and patients with drug-resistant focal epilepsy. A core objective of Dr. Royer’s research is the development of openly available datasets and tools to facilitate future studies on brain organization in health and disease.
Amir Shmuel is the director of the Brain Imaging Signals Lab and a core faculty member of the McConnell Brain Imaging Centre of the Montreal Neurological Institute. He is a Professor of McGill University’s Departments of Neurology, Neurosurgery, Physiology, and Biomedical Engineering. Shmuel served as the chair of the organizing committee and chair of the sixth conference of the International Society for Brain Connectivity. His research program focuses on understanding functional brain imaging signals and evaluating the degree to which they reflect the underlying neuronal activity, cortical lamina resolved neurophysiology and neuro-imaging, and using machine-learning techniques for early detection of neurological diseases.

Hilary Sweatman is a PhD Candidate in the Integrated Program in Neuroscience at McGill University. Under the supervision of Prof. Xiaoqian Chai, she conducts research on the development of memory and mentalizing in autism spectrum disorder. In 2020, Hilary co-founded NeuroLingo, an initiative aimed at bridging the gap between the scientific community and the public. She co-founded it alongside her co-founders, Hyo Lee, Alice Morgunova, and Hannah Jin. NeuroLingo's primary goal is to empower neuroscience trainees with essential science communication skills. To achieve this, they offer graduate students specialized training in presentation skills and organize events that bring Montreal’s community closer to cutting-edge neuroscience research.

Stuart Trenholm is a neuroscientist at The Neuro, where he holds a Canada Research Chair in neuronal circuits of vision. His lab studies visual processing in the brain, as well as the outcomes of vision loss on the brain. In his “spare time”, he is trying to put together a cutting-edge open online neuroscience ‘textbook’ – The Open Brain.
Talk Abstracts

**KEYNOTE LECTURE**

**Open Science: Challenges and Opportunities**
Vincent Larivière

The advent of digital technology has made possible a range of knowledge production and dissemination practices referred to as open, spanning from open research data to open access publishing. Although often grouped under the term open science and aimed at making science more accessible, reproducible, and transparent, these practices adhere to distinct logics and have been embraced to varying degrees by the scientific community. This presentation will provide an overview of the various challenges associated with open science, with an emphasis on those related to research dissemination and evaluation. We will also discuss the issue of incentives and their impact on knowledge dissemination practices and examine how the pandemic has influenced these practices. Finally, we will conclude with a discussion of the roles of universities and funding agencies in fostering a culture of open science.

**PANEL DISCUSSION**

**Open Science as a Driver of New Drug Discovery Models**
Ryan Merkley, Suneel Kumar & Brian Fiske

Moderator: Viviane Poupon

Open science breaks down barriers in drug development, providing transparency, building unimagined collaborations, boosting global efforts and accelerating the delivery of new and effective medicines at much lower costs. Join us for the panel "Open Science as a Driver of New Drug Discovery Models" to learn about Conscience, an emerging biotech non-profit building a Canadian open science drug discovery ecosystem to drive equitable access to new medicines, in areas of market failure like rare disease, and pandemic preparedness. You will also hear how the CACHE Challenges, a key Conscience initiative, are harnessing the power of artificial intelligence and open collaboration to identify promising therapeutic molecules. A representative from Michael J. Fox Foundation will complete the panel and provide insights from a patient advocacy group and funding body on why patients believe these Open Science initiatives hold great promise for helping patients around the world. The panel will be an opportunity to learn from success stories and discuss the main challenges and barriers to implementing Open Science in drug discovery.
The White Matter Rounds Initiative
Ruwan Bedeir

The White Matter Rounds were launched in 2013 at the Neuro as monthly discussions among neurologist experts in white matter disorders to accelerate the diagnostic process for patients and reduce the risk of misdiagnosis. The WM Rounds have rapidly attracted the interest of other clinicians and researchers and have become an international network with more than 15 participating centers from all around the world. Our aim is to create a website platform to further increase collaborative opportunities, improve open science data sharing, and provide the basis for joint research studies on white matter disorders, as well as patient advocacy and education.

Parkcore: A Collaborative Research Initiative to Facilitate Reproducible and Open Science in Global Parkinson’s Disease (PD) Studies
Nikhil Bhagwat

Open research requires both the institutional culture and knowledge to implement open practices and underlying technical framework. In Low-&-Middle-Income-Countries, such as India, these practices are significantly limited by the availability of resources and competing priorities. Thus, under ParkCore, we established a partnership with the NIMHANS, India, to support open-science practices through technology transfer and training. As neuroimaging studies get bigger, collecting and curating high-quality data from under-represented populations and regions becomes an important challenge. NIMHANS is uniquely positioned to recruit and study large numbers of patients with the availability of expert clinicians and state-of-the-art MRI scanners. Through this collaboration, we have deployed data curation, processing, and sharing tools (Nipoppy) built on open standards for a large, ongoing PD study. Further, we are implementing a federated ecosystem (Neurobagel) to harmonize and pool NIMHANS data with other Canadian and global PD studies while protecting the local data governance and privacy.

Establishing Sustainable Capacity for Neuroimaging Science in Africa
Harrison Aduluwu

Availability of infrastructure and skilled personnel are major barriers to implementing open neuroscience in resource limited settings, particularly across Africa. At the Consortium for Advancement of MRI Education and Research in Africa (CAMERA), we are training a collaborative network of African experts to optimize imaging infrastructure with the aim of obtaining rich datasets, developing relevant imaging tools, and sharing unique insights that will advance neuroimaging discoveries worldwide. This talk will outline our approach to establishing long-lasting capacity for neuroimaging science in Africa.
**Technical Innovations in Open Science: The C-BIG Repository and Patient Registry**

*Jason Karamchandani*

One of the original five TOSI “guiding principles” was the creation of an open science biospecimen and data repository, which at the Neuro is called the C-BIG platform. This combined repository and patient registry has been operating in the Open Science space since 2016 and contains more than 50 thousand samples from nearly 4 thousand patients. This session will cover the unique technical innovations developed in order to best meet and respond to the needs of researchers and patients: a virtual consent platform facilitate patient partnerships, and a novel multi-project institutional database solution.

**SESSION 2:**

**OPEN-SOURCE SOFTWARE ENABLING NEUROSCIENCE RESEARCH**

*Moderator: Jean-Baptiste Poline*

**Pynapple: Open-Source Python Library for Neurophysiological Data Analysis**

*Adrien Peyrache*

Datasets collected in neuroscience and neurology are of ever-growing complexity, often combining high dimensional time series data from multiple acquisition modalities. Handling these various data streams in an adequate programming environment is crucial to ensure reliable analysis, and to facilitate sharing of reproducible pipelines for newly developed analysis methods. We have developped Pynapple, the Python Neural Analysis Package, a lightweight and open-source Python package designed to analyze a broad range of data modalities in neuroscience. The organization of the software provides flexibility for the development and dissemination of analysis methodology in a rapidly developing field while ensuring long-term stability of the core package. The Pynapple package is now available to the scientific community with a stable version. It already includes several tutorials for beginners and advanced users. Our goal is to make it a standard analytical pipeline for a broad user community, from basic neuroscience to neurology.

**Open Data and Methods for Studies of Multiscale Brain Organization**

*Jessica Royer & Raul Rodríguez Cruces*

Magnetic resonance imaging (MRI) has been instrumental in gaining a better understanding of multiscale interactions between brain structure and function. Advances in image acquisition protocols have been paralleled by improved methods and analytics to reconcile the diverse data generated from multimodal neuroimaging. These strides have been catalysed by open science practices, particularly the growing availability of open datasets and methods facilitating more reproducible and collaborative workflows. This talk will showcase our data and software sharing efforts, with a particular focus on the publication of a multimodal MRI dataset, through the publication of our dataset for Microstructure-Informed Connectomics (MICA-MICs, DOI: 10.17605/OSF.IO/J532R), and the design open and flexible pipelines for multimodal MRI analysis (micapipe.readthedocs.io). Our open data and methods offer a broad access to researchers interested in studying the multiscale organization of the human brain, while also augmenting future assessments of generalizability and replicability in neuroimaging.
Using Deep Learning for Detecting Artifacts in Structural Magnetic Resonance Images

Amir Shmuel

Magnetic resonance imaging (MRI) is increasingly being used to delineate morphological changes underlying neurological disorders. However, image artifacts frequently compromise the utility of the images, making it critical to screen the data. Currently, quality assessment requires visual inspection, a time-consuming process that suffers from inter-rater variability. Automated methods have achieved high accuracy using small datasets, with balanced proportions of MRI data with and without artifacts. Detecting artifacts in large, imbalanced databases remains difficult. I will present a method we developed for detecting artifacts in large, imbalanced databases of MRI images using deep learning, data ramping, and uncertainty estimation.

Canada Bioimaging National Omero Image Data Resource

Judith Lacoste

Significant advances in spatiotemporal resolution have led to ever-expanding microscopy datasets which, without agreed-upon community guidelines, are challenging to reproduce, quantitatively analyze (including AI-assisted strategies), and re-use. As such, biomedical advances crucially depend on the generation of high-quality F.A.I.R. datasets. This, in turn, requires the seamless integration of community-specified image documentation practices within the Research Data Management (RDM) pipelines required to ensure the execution, tracking, and documentation of the entire life cycle of data from sample preparation to publication. To address these challenges, open-source standards and tools are being developed by international imaging communities (https://quarep.org/ and https://www.bioimagingnorthamerica.org/) to support both pre- and post-publication imaging RDM through the automated capture, storage, and reporting of the necessary image metadata to support the reproducibility and reusability of imaging data. The unique Canada BioImaging resource hosted on the Digital Research Alliance of Canada will be presented.

Session 3: Science Outreach, Science Communication and Patient Engagement

Moderator: Linda Lafontaine

NeuroLingo: Training The Next Generation of Science Communicators

Hilary Sweatman

NeuroLingo is a TOSI-sponsored initiative founded in 2020 with the goal of creating opportunities for neuroscientists to connect with the greater Montreal community. Our mission is rooted in the belief that science communication is an indispensable skill for scientists, closely intertwined with the principles of Open Science. Moreover, we believe that it is imperative to involve and inform the non-scientific community about ongoing research endeavours. This engagement not only cultivates trust in the scientific process but also empowers individuals to participate in making informed policy decisions. I will discuss how we equip neuroscience trainees with a skillset in science communication and how we foster continued engagement with the community.
Making Parental Mental Health Research Accessible to All Parents

Cindy Hovington

If we truly want to make a difference in parental mental health and the impact this can have on their children, we need to make science accessible and digestible to all parents. For the past 5 years, I have been sharing science with parents and helping them understand how to nurture their own emotional health as well as their developing child. Science communication and outreach are at the core of Curious Neuron and our model has led to us growing a community of over 141,000 parents in over 85 countries.

Open Science Office Hours

Kendra Oudyk

The goal of OSOH is to empower researchers to make their work more open. Many researchers learn about Open Science skills at short events like conferences, summer schools and hackathons, but they may not have continuous in-lab support for using what they have learned in their everyday research. Further, through funding and institutional mandates, researchers are feeling increasing external pressure to do open science. OSOH provides Office Hours whereby anyone can receive one-on-one, personalized support to integrate Open Science practices in their work. We also provide a curated, interactive list of open-science resources on our website, as well as monthly educational lectures. We have been running OSOH since September 2023. This talk will outline what OSOH provides, the lessons we have learned in the first few months, and our plans for the future.

The Open Brain - A New Kind of ‘Textbook’

Stuart Trenholm

Textbooks are fundamental learning tools, but the nature of most textbooks has not significantly changed in a very long time. Recent developments in digital and web presentation tools provide an opportunity to update what a textbook can be. Here, I'll describe the first chapter of 'The Open Brain', a new online learning tool for neuroscience education.
Organizing Committee

Thomas Durcan, Associate Professor, The Neuro and Chair, TOSI Prize Committee
Leah Lefort, Tanenbaum Open Science Institute Coordinator
Gabriel Pelletier, Open Science Data Manager, Tanenbaum Open Science Institute (TOSI)
Luisa Pimentel, Open Science Community Officer, Tanenbaum Open Science Institute (TOSI)
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