

# THE MCGILL UNIVERSITY RESEARCH CENTRE FOR STUDIES IN AGING (MCSA)



April 2024 – 22<sup>TH</sup> EDITION



**Keeping you updated on the latest news, events, and research achievements!**

The scientific achievements from last year were possible thanks to the active participation of our patients, their relatives, and friends. Together, we advance clinical science towards new therapies for Alzheimer's Disease.



## WHEN APHASIA, APRAXIA AND MUSIC COLLIDE

The McGill University Research Centre for Studies in Aging (MCSA) is extremely grateful, proud and has the pleasure of knowing Donald through his association with our Centre, and after hearing of his story and his passion for music we were inspired to hear more. Please find below a brief introduction from Donald himself and short interview with the MCSA.

"Hi, my name is Donald. I was diagnosed with the non-fluent variant of primary progressive aphasia and apraxia, in the spring of 2020. I love Folk Music and I play guitar and sing. Singing/playing songs is very important for me. I belong to a Celtic Choir (Mouth Music) directed by Linda Morrison. Linda Morrison is "One of Canada's best and most multi-faceted singer-songwriters." We are about 30 choir members, and Linda Morrison started Mouth Music 6-1/2 years ago. Mouth Music sings in English, Scottish/Irish Gaelic, Welsh, and Manx. I have to practice extra hard...but I love Mouth Music! Some are very fast songs, it's very hard for me



to sing up to speed...in a few spots, I sing quietly. Our last Cèilidh (performance) was on 17 Feb 2024. Each Cèilidh also features several ensembles with 2-6 people singing. My ensemble sang an old sea shanty. Mouth Music performs Ceilidhs two times a year (next Cèilidh is June 15). Mouth Music performs at various events; Empty Bowls, NDG Porchfest, The Theresa Foundation, and at senior residences. I played guitar and sang in Night of Aphasia Arts (USA National Aphasia Association), in Dec 2022 and Mar 2023."

I have red shirt in ensemble photo (with guitar), and choir photo.

Cheers,

Don

## Q & A

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*There has been countless research conducted on how music can treat aphasia. One theory is that because music crosses the hemispheres of the brain, it creates new neural pathways for language. How do you think music has helped you in your journey with aphasia?* My neurologist recommended MedRhythms (Zoom meetings...practice every day music/rhythms therapy). I like it. Music and rhythms activate various parts of the brain. Playing music is very good for the brain for all people...especially as we get older.

*From your personal experience, how has music helped shape your life and illness?* I love music (I'm an audiophile) and enjoy singing/playing songs. I still enjoy listening to music and singing/playing songs (select songs). I also enjoy the social aspect of singing. My thoughts...adapt, still enjoy life!

*What are some challenges that aphasia has posed on your musical journey?* Many Folk songs are now impossible for me to sing. I can select my songs to sing. It's helpful to see the words of the song. Mouth Music songs I have to practice extra hard. Some Mouth Music practice tracks songs, I put in Garage Band to slow down the practice tracks.

*What inspired you to start singing?* I started singing Folk songs in University (48 years ago), with a used (cheap) acoustic guitar. I started to sing with Linda Morrison over 40 years ago when she directed the Yellow Door Choir. I was also a member of an a cappella octet called the Burton Street Singers.

*Do you compose/write your own songs? If so, what is the creative process like? If not, what is stopping you?* Maybe I could start to compose songs that people with aphasia and apraxia could sing!

### **Here is a short paragraph to help readers understand this disorder By Dr. Maiya Geddes, MD, FRCPC**

Primary progressive apraxia of speech is a motor speech disorder characterized by a slower speaking rate, challenges in coordinating articulatory movements of the mouth required to produce sounds and words, and changes in the musical quality (called "prosody") of speech. This impacts a person's ability to produce speech, making it harder to communicate. In contrast, primary progressive aphasia impacts language itself, including word concepts and naming, in addition to understanding and expression of language. To learn more, please visit: <https://aphasia.org>

## MCGILL DEMENTIA EDUCATION PROGRAM (DEP)



Dr. Pedro Rosa-Neto   Dr. Serge Gauthier   Dr. José A. Morais   Claire Webster

The McGill Dementia Education Program (DEP) is pleased to announce that their administrative offices will now be located at the McGill Research Centre for Studies in Aging (MCSA) facilities.

The DEP was created in 2017 with the goal of supporting care partners of people living with Alzheimer's disease and other forms of dementia. This initiative is led by a multidisciplinary team which includes program founder and former caregiver Claire Webster, academic lead and geriatrician Dr. José A. Morais, and academic co-lead and neurologist Dr. Serge Gauthier, who was also the former director of the MCSA from 1986 to 1997, and Director of the Alzheimer Disease and Related Disorders Research Unit of the MCSA until he retired from clinical duties in 2021. They are supported by the program coordinator, Maria Vincelli, and the communications and community outreach officer, Diane Weidner.

The DEP leverages the expertise of the McGill network and works with leading experts within the Faculty of Medicine and Health Sciences and beyond to develop trusted multilingual educational resources and platforms, all freely available on their website at [www.mcgill.ca/dementia](http://www.mcgill.ca/dementia).

Given the MCSA's vision to advance dementia prevention and therapies via the integration of excellent patient care, transformative research and world-class knowledge dissemination, there is a natural synergy between our two entities. For example, the current MCSA Director, Dr. Pedro Rosa-Neto, collaborated with the DEP team to co-author the 2021 and 2022 editions of the World Alzheimer Report. In 2023, the DEP and MCSA joined forces to launch the Young Caregiver Community virtual support groups, headed by Mallery Landry.

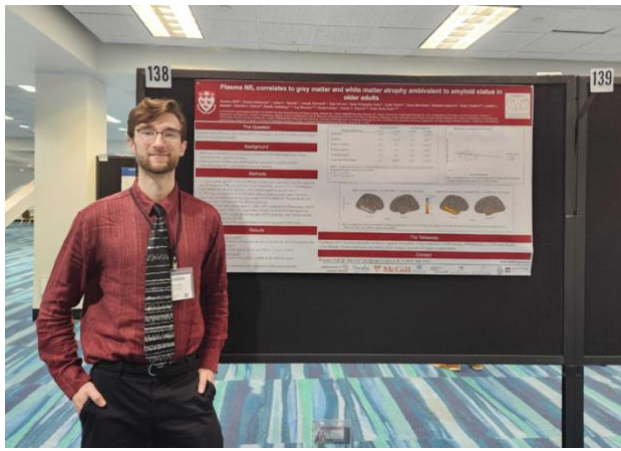
We look forward to sharing our educational resources and strengthening our collaboration to continue to support patients and care partners of people living with neurocognitive disorders.

## HUMAN AMYLOID IMAGING (HAI 2024) CONFERENCE



Arias Fernandez, Ali Hosseini, Lydia Trudel, Brandon Hall, Etienne Aumont and Wan Lu Jia.

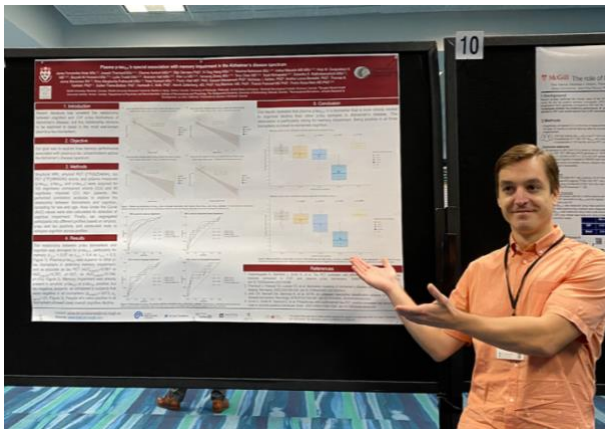
The students of Dr. Rosa-Neto attended the 2024 Human Amyloid Imaging (HAI2024) in Miami, Florida on January 17<sup>th</sup> and 19<sup>th</sup>. It consisted of a ground-breaking series of talks on fluids and PET-biomarkers used in research on dementia. The conference remains at the forefront of unraveling the mechanisms and improving the diagnosis and understanding of Alzheimer's and other related neurodegenerative diseases. At this conference, attendees had the opportunity to review the basic, fundamental principles of amyloid and tau, Alzheimer's Disease hallmarks, using fluids and PET biomarkers. The students presented their work at the international conference which allowed them to learn and exchange their research in the field with other research groups. MCSA Students that attended include: Nesrine Rahmouni, Yi-Ting Wang, Jaime



### Brandon Hall, PhD student

**Title:** "Plasma NfL correlates to grey matter and white matter atrophy ambivalent to amyloid status in older adults"

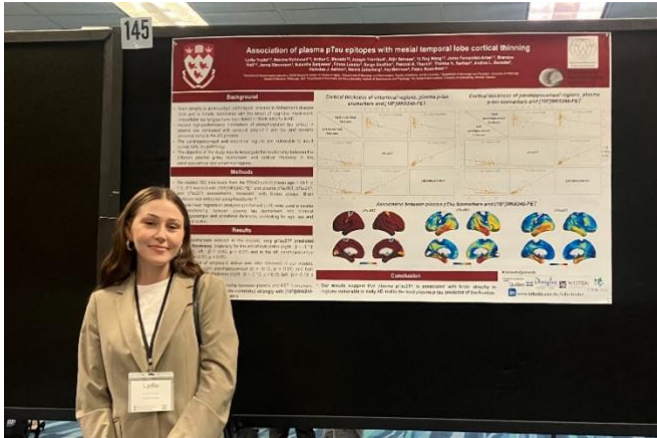
**Summary:** This study used subjects from the TRIAD cohort to investigate the utility of blood plasma neurofibrillary light chain (pNfL) to predict follow-up changes in grey matter volume in regions relevant to AD, as well whole-cerebrum white matter volume. This investigation was stratified by PET-amyloid positivity and found that PET-amyloid-negative participants demonstrated a stronger correlation between baseline pNfL levels and follow-up brain changes.



### Jaime Fernandez Arias, PhD student

**Title:** "Plasma p-tau217's special association with memory impairment in the Alzheimer's disease spectrum."

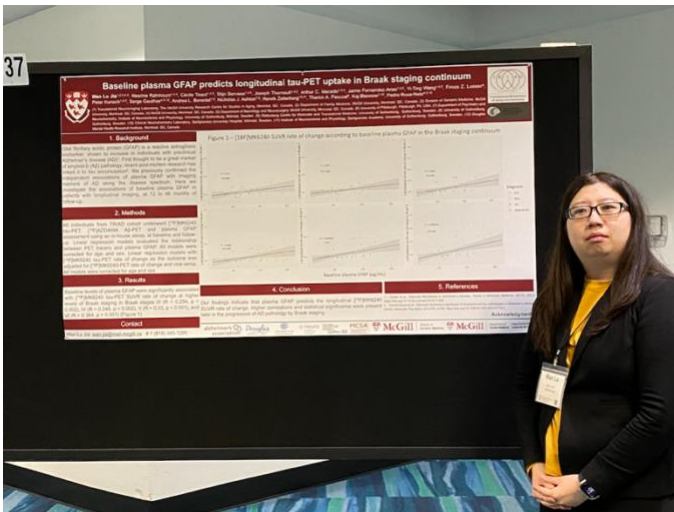
**Summary:** plasma p-tau217's association with memory scores is stronger than that between other p-tau epitopes and memory scores. Plasma p-tau217 is also superior to 231 and 181 in detecting memory impairment. Finally, people who are amyloid PET and plasma p-tau218 or 181 positive but tau PET negative show a subtle memory deficit, while participants who are positive in all biomarkers display widespread cognitive impairment.



### Lydia Trudel, PhD Student

**Title:** Association of plasma pTau epitopes with mesial temporal lobe cortical thinning.

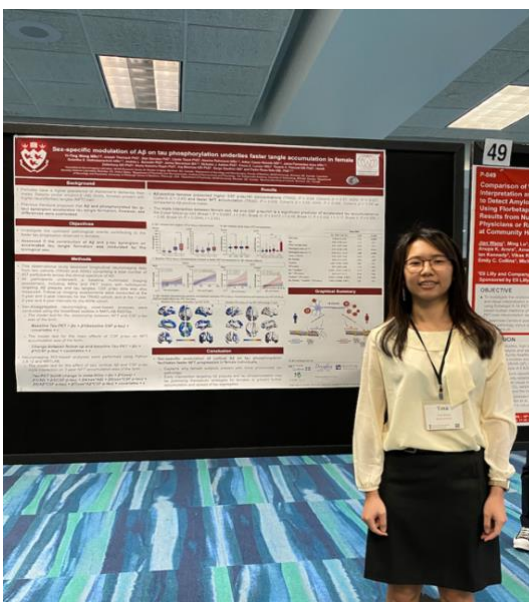
**Summary:** The results of this research project suggest that higher levels of blood biomarkers of tau are associated with cortical thinning of the mesial temporal lobe. This is important because atrophy of this lobe in Alzheimer's disease has been associated with cognitive decline.



### Dr. Wan Lu, Master's Student

**Title:** Baseline plasma GFAP predicts longitudinal tau-PET uptake in Braak staging continuum

**Summary:** Our findings indicate that plasma GFAP predicts the longitudinal [18F]MK6240 SUVR rate of change. Higher correlations and statistical significance were present later in the progression of AD pathology by Braak staging.



### Tina Wang, PhD student

**Title:** Amyloid-dependent tau phosphorylation accelerated tau tangle accumulation in females

**Summary:** Females have higher prevalence of dementia due to Alzheimer disease than males. In this study we showed that Aβ-dependent tau phosphorylation plays a key role in initiating tau pathology in females, and lead to faster tau tangle formation. The findings suggested that females may benefit from earlier intervention in clinical trials targeting Aβ plaques, In addition, drugs reducing p-tau concentrations can also be promising therapeutic strategies for female patients to prevent further spreading of tau aggregates and cognitive decline.

**Nesrine Rahmouni, PhD Student**

**Title:** Neuroinflammation potentiates the effect of amyloid- $\beta$  on longitudinal tau accumulation

**Summary:** It has been proposed that microglia released proinflammatory factors reactive to amyloid plaques constitute an early event leading to tau pathology. Here we assessed how the rate of progression of tau-PET is affected by baseline levels of amyloid- $\beta$  and neuroinflammation in the TRIAD cohort. Our results support the hypothesis that microglial activation and amyloid- $\beta$  aggregates facilitates tau progression interactively. Our results also support the notion that microglial abnormalities might be an early upstream event, presumably before tangle formation.

**Etienne Aumont, PhD Student**

**Title:** Disentangling the relationships between tau-PET, amyloid- $\beta$ -PET, hippocampal subfield volumes, and memory: a longitudinal study

**Summary:** Longitudinal change in tau-PET in the hippocampus is the best predictor of hippocampal subfield atrophy. This means that hippocampal atrophy is more closely related to tau accumulation than to initial tau load.

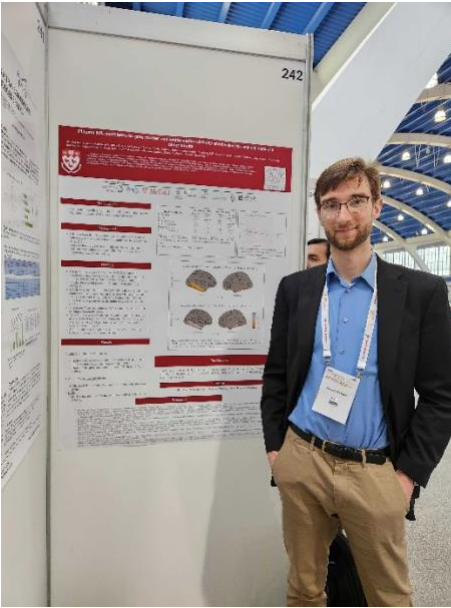
## THE AD/PD CONFERENCE - INTERNATIONAL CONFERENCE ON ALZHEIMERS'S AND PARKINSON'S DISEASES AND RELATED NEUROLOGICAL DISORDERS - MARCH 2024



The students from the McGill Research Centre for Studies in Aging attended the 2024 Alzheimer's Disease and Parkinson's Disease (ADPD2024) conference which consisted of a ground-breaking series of talks on fluids and PET-biomarkers used in research on dementia. The conference remains at the forefront of unraveling the mechanisms and improving the diagnosis and understanding of Alzheimer's and other related neurodegenerative diseases. This year, the conference was hosted in Lisbon, Portugal, from March 4th to March 9th. At this conference, attendees had the opportunity to review the basic, fundamental principles of amyloid and tau, Alzheimer's Disease hallmarks, using fluids and PET biomarkers. Attending this conference allowed the students to learn more about neuroimaging and biomarkers, which are the key subjects of their thesis:

discussing the pathogenesis of Alzheimer's Disease, using plasma and PET-imaging biomarkers. They will be presenting their work at this international conference which would allow them to learn and exchange about their research in the field with other research groups.

**BRANDON HALL, PhD Student**



**Poster Title:** "Plasma NfL correlates to grey matter and white matter atrophy ambivalent to amyloid status in older adults."

**Description:** " Previous research into blood-based biomarkers has shown that plasma neurofibrillary light chain (pNfL) levels increase in correlation with cortical atrophy. However, the vast majority of prior studies have been cross-sectional, which limits interpretation of this relationship. Here, we examined pNfL levels together with longitudinal measures of grey matter atrophy, white matter atrophy, and cognitive health. These investigations were stratified by amyloid beta levels in the cortex—a hallmark of Alzheimer's disease, as well as other diseases. Our results indicate that pNfL is best correlated with atrophy in participants with low amyloid burden, suggesting that pNfL may be a useful marker of non-amyloid dementias. Interestingly, we found that as pNfL levels increase (as in atrophy), the volume of cortical white matter increases. These results warrant further investigation and may be related to neuroinflammation."

**Yi-Ting Wang, PhD Student**



Yi-Ting the opportunity to present both an Oral and Poster presentation.

**Oral presentation title:** Sex-specific modulation of A $\beta$  on tau phosphorylation underlies faster tangle accumulation in females. **Description:** We investigated why female individuals with dementia due to Alzheimer's disease present more tau tangle pathology.

**Poster presentation title:** Hormone therapy mitigates Alzheimer's disease tau biomarkers in post-menopausal females: evidence from 2 independent cohorts. **Description:** We examined the impacts of hormone therapy on AD biomarker-informed pathologies.



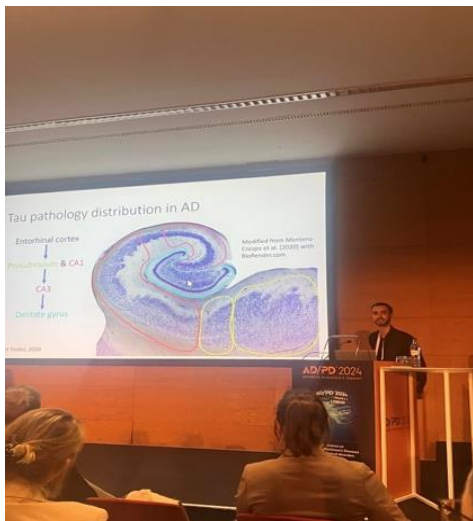
### Arthur Macedo, *Master's Student*

Arthur the opportunity to present both an Oral and Poster presentation.

**Oral presentation title:** Comparison of [18F]MK6240 and [18F]AV1451 for PET-based BRAAK Staging: The Head Study

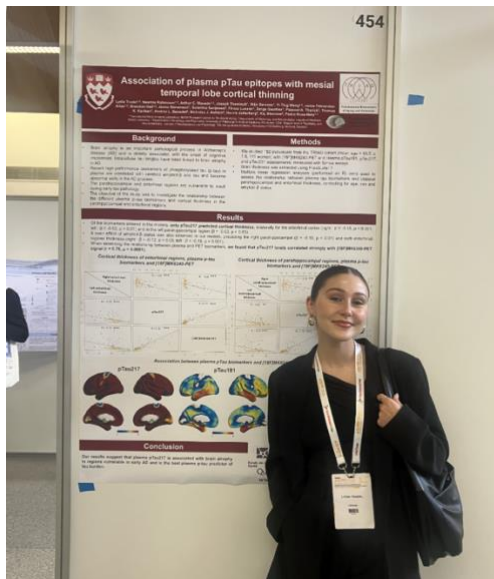
**Description:** We investigated why female individuals with dementia due to Alzheimer's disease present more tau tangle pathology.

**Poster presentation title:** Increased Body Mass Index and Waist Circumference are Associated with Lower Plasma Levels of Alzheimer's Disease Biomarkers. **Description:** This study talks about the influence of body mass index and waist circumference for the assessment of the levels of Alzheimer's disease biomarkers in body fluids.



### Etienne Aumont, *PhD Student*

**Oral presentation description:** Hippocampal atrophy over time comes with tau pathology accumulation in the hippocampus over that same period. However, it is unlikely to be the reason for memory decline in Alzheimer's.



### Lydia Trudel, *PhD Student*

**Title :** Association of plasma pTau epitopes with cortical thinning of the medial temporal lobe

**Brief summary :** The results suggest that higher levels of blood biomarkers of phosphorylated tau are associated with atrophy the medial temporal lobe, which has been associated with cognitive decline.

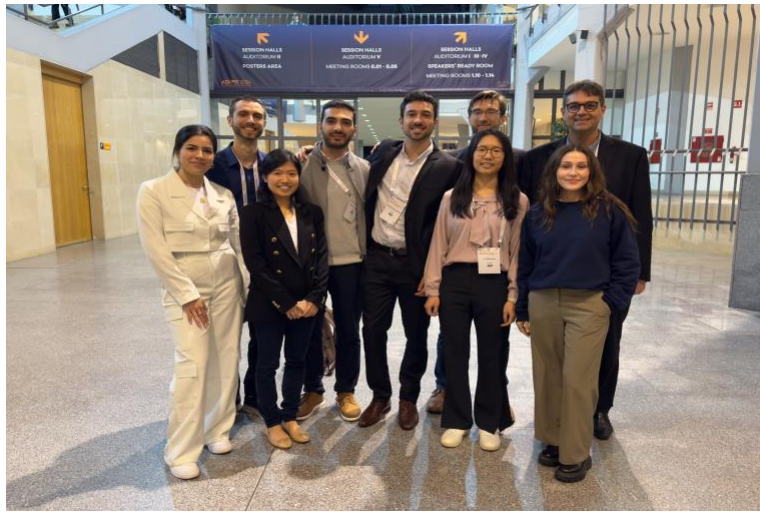




**Nesrine Rahmouni, PhD Student**

**Oral Presentation Title:** Inflammation- and Amyloid-β-PET predict longitudinal increase of plasma pTau127 in Alzheimer’s disease.

**Oral Presentation Description:** Here, we investigated the effect of baseline levels of amyloid-β, tau and inflammation on longitudinal change of tau phosphorylation in plasma (plasma pTau) in the TRIAD cohort. Our study shows that baseline levels of inflammation-PET and amyloid-PET can predict longitudinal changes of plasma pTau independently, while tau-PET does not. This could indicate that inflammation might be put as an early upstream event, presumably before tau pathology.



## HONOURARY PRESENTATION BY DR. PAOLO VITALI



On February 7<sup>th</sup>, 2024, neurologist, Dr. Paolo Vitali, gave a talk on **the role of biomarkers in the diagnosis of Alzheimer’s disease**, for the Annule Colloquium Barclay Family Educational Series at the Alzheimer’s Society of Montreal.



## AS SEEN IN QUÉBEC SCIENCE: ALZHEIMER'S - TOWARDS EARLY DETECTION

As summarized in the Quebec Science article, Alzheimer's is characterized by the accumulation of amyloid plaques and tau protein in the brain -an accumulation that begins well before the appearance of symptoms. Dr. Rosa-Neto's team believes this accumulation can be detected thanks to the presence of these proteins in the blood, opening the possibility of treating people before they develop dementia, explains Dr. Pedro Rosa-Neto. For this reason, Dr. Rosa Neto's team is working on how a simple blood test could replace the expensive and invasive diagnostic tools currently used to detect Alzheimer's disease by monitoring of more than 1,000 people registered in the "Biomarkers of aging and dementia" (BioVie) cohort at the Douglas Research Center in Montreal.

Having a diagnostic blood test would facilitate the establishment of large-scale preventive clinical trials.

To date, diagnosis is mainly based on brain imaging and lumbar punctures. However, these examinations are expensive and invasive, and require the assistance of specialist doctors. "Currently, in Canada or in other countries, there is not sufficient infrastructure to administer these tests to everyone. We are in the process of validating blood tests (i.e., comparing the results with traditional diagnostic tests) to use them on a larger scale, among family doctors," as per Dr. Rosa-Neto. The neurologist specifies that these new tests could be a "clinical reality within one or two years".

To read the original article, visit: <https://www.quebecscience.qc.ca/parteneriat/alzheimer-depistage-precoce/>

## NeuroReceptor Mapping Conference (NRM) & PK 2024

This conference is dedicated to unravelling the amazing complexity of the human brain in health and disease, which sees 300 international attendees hailing from over 20 countries coming together and sharing the latest research developments in the field.

Since 1997, the NRM convenes experts in the field of neuroreceptors and serves as a platform to discuss the latest breakthroughs in quantifying neuroreceptors in the human brain using Positron Emission Tomography (PET). A wide range of methodological advances are traditionally discussed, including novel brain molecular imaging agents, pharmacokinetic analysis, radio metabolites and analytical methods are traditionally discussed in this meeting. Furthermore, the NRM includes sections devoted to neuroreceptor abnormalities in neuropsychiatric and neurological conditions with particular attention to quantification of protein aggregates in neurodegenerative conditions.



In 2018, Dr. Rosa-Neto attended a meeting in Edinburg where he announced Montreal had been elected to host the 2020 NeuroReceptor Mapping Conference (NRM 2020).

Due to the pandemic, the NRM scientific conference was re-scheduled virtually in 2021. This year the Centre plans for an outstanding NRM 2024 conference (May 18-21). Montreal stands out as a hub of technology and cultural diversity in North America, and it represents a unique setting for continuing the discussions started in UK (and online). The meeting will be hosted by the McGill University, Clinical & Translational Sciences (CaTS) McGill University, McGill University Research Centre for Studies in Aging, Montreal Neurological Institute and Douglas Mental Health University Institute. The conference shall also be preceded by the PK Course-Pharmacokinetics: PET-PK course, a distinctive educational opportunity for mastering the essentials of PET quantification, led by field-leading experts. This year, the course will take place from May 16 - May 18 2024 at the Montreal Neurological Institute (MNI, the Neuro), a renowned institution in the realm of neuroimaging.

## THE BRAINY BOOMERS CONFERENCES

Alyssa, Alesia, Emma, Gabrielle, Amelia, and Amanda are Registered Nurses actively working in the clinic and hospital settings. They also are currently pursuing their bachelor's degree in nursing at McGill University.

Throughout this academic semester, they have been working on a community health nursing project. Assigned to the Almage Community Centre, they identified a pressing concern: the need for effective exercise programs tailored to seniors.

They worked to research adaptive exercise routines specifically designed to cater to the needs of seniors, aiming to enhance their physical fitness and reduce the risk of falls.

Today, Alesia, Gabrielle, and Amanda, on behalf of the whole team, are prepared to share their findings and recommendations in a comprehensive presentation.



## DEMENTIA EDUCATION PROGRAM PRESENTS NEW COMMUNITY OUTREACH ACTIVITY: *YOUNG CAREGIVER COMMUNITY*

### Young Caregiver Community

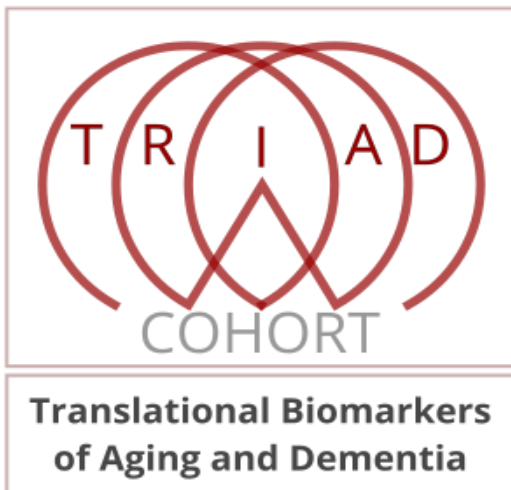
A supportive space for informal caregivers who are looking after a person with young-onset dementia.



The McGill University Research Centre for Studies in Aging and the Dementia Education Program have joined forces to offer free, monthly virtual support groups for young caregivers who are looking after a parent, a spouse or a sibling with young-onset dementia, a diverse condition that affects people under the age of 65. This community outreach initiative offers a safe, non-judgmental online space for caregivers to share their stories, voice concerns and discuss the joys and challenges of this role with their peers. Info and registration: <https://mcgill.ca/x/UfF>



## WANT TO GET INVOLVED IN RESEARCH ? JOIN THE TRIAD COHORT



The Translational Biomarkers in Aging and Dementia (TRIAD) cohort is a longitudinal observational cohort specifically designed to study mechanisms driving dementia. The cohort studies dementia markers and their progression from pre-symptomatic stages to the onset of Alzheimer's disease or other types of dementia. TRIAD participants are followed in a longitudinal manner with clinical and neuropsychological assessments, fluid and imaging biomarkers every 24 months. Results generated from the TRIAD cohort help advance scientific knowledge and develop better targeted clinical trials to cure Alzheimer's Disease and dementia. The TRIAD cohort is actively recruiting participants, for more information about the participation criteria and the different measures please refer to <https://triad.tnl-mcgill.com>, to get additional information or to participate call our research Centre **514-761-6131 ext: 6321**. For research participants and sponsors that are interested in donating to the TRIAD Cohort

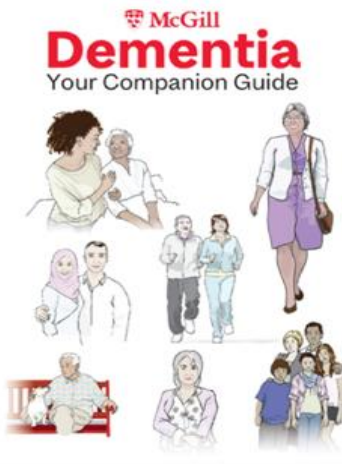
Research Study, please contact **Jenna Stevenson** by email [jenna.stevenson2@affiliate.mcgill.ca](mailto:jenna.stevenson2@affiliate.mcgill.ca)

## WHY YOUR DONATIONS ARE SO IMPORTANT

Between 2020-2022, our fundraising activities were impacted by the pandemic. Your continued support and encouragement were crucial and have played a central role in the continued success of the Centre's outreach, research infrastructure objectives, and medical research initiatives for the community. **We thank you for your loyal and ongoing support!** Thank you for helping us advance our mandate towards prevention, aging research, and education. Income tax receipts shall also be issued for all donations exceeding \$15.00. If you would like to donate by mail, phone or email, please contact Silvana Aguzzi at 514- 761-6131 X 6308 or by email [silvana.aguzzi@mcgill.ca](mailto:silvana.aguzzi@mcgill.ca) or Alexandra Triantafillopoulos at 514-761-6131 X 6311 or by email [alexandra.triantafillopoulos1@mcgill.ca](mailto:alexandra.triantafillopoulos1@mcgill.ca)



## DEMENTIA, YOUR COMPANION GUIDE



A free new educational resource, *Dementia, Your Companion Guide*, was designed to help provide answers. With engaging illustrations and a friendly writing style, this approachable guide covers a wide array of topics to assist both the person living with dementia (PLWD) and their care partners. It includes information on the science and progression of dementia as well as practical advice on safety and self-care. The Book is available in English, French, Spanish, Chinese and Greek.

The guide was created by a multidisciplinary team at the McGill University **Dementia Education Program** (DEP) in the Faculty of Medicine and Health Sciences (FMHS). The content was provided by the Program's founder and former care partner **Ms. Claire Webster**, geriatrician **Dr. José A. Morais** and neurologist **Dr. Serge Gauthier**, along with partners from the McGill University Research Centre for Studies in Aging, the Division of

Geriatric Medicine, the School of Physical and Occupational Therapy, and the School of Social Work.

**Ask for a copy of the book at your next appointment at MCSA or Crossroads! Or Visit:**

<https://www.mcgill.ca/medsimcentre/community-outreach/dementia>

## STAY UP TO DATE WITH MCSA

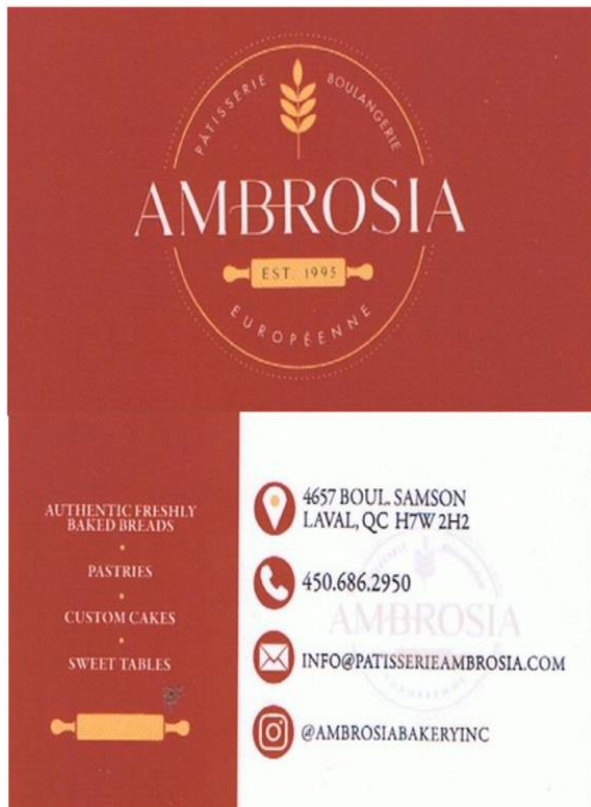
Good day,

We hope that you are all enjoying the good weather! We are presently updating our files and would appreciate knowing if there are any changes in your address, telephone number or email address. If yes, please contact us at T:514-766-2010 ext 6308.

You have received this month's Newsletter of April 2024. We are interested in having your feedback. Call us at the above number or send us an email with your comments to [silvana.aguzzi@mcgill.ca](mailto:silvana.aguzzi@mcgill.ca) or [brainy.boomer-mcsa@mcgill.ca](mailto:brainy.boomer-mcsa@mcgill.ca)

In case you haven't joined us for our Brainy Boomer Lectures (BB), please send us your email address and we will add you to our BB lectures email list. In case you are interested and would like to check out our recorded BB YouTube lectures please check out the following link: <https://www.youtube.com/c/MCSA2021>.

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### Contact

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