The Canadian Association for Neuroscience presents

13th Annual Canadian Neuroscience Meeting

Meeting Program

CAN-ACN
CANADIAN ASSOCIATION FOR NEUROSCIENCE
ASSOCIATION CANADIENNE DES NEUROSCIENCES

May 22–25, 2019

Sheraton Centre Toronto Hotel

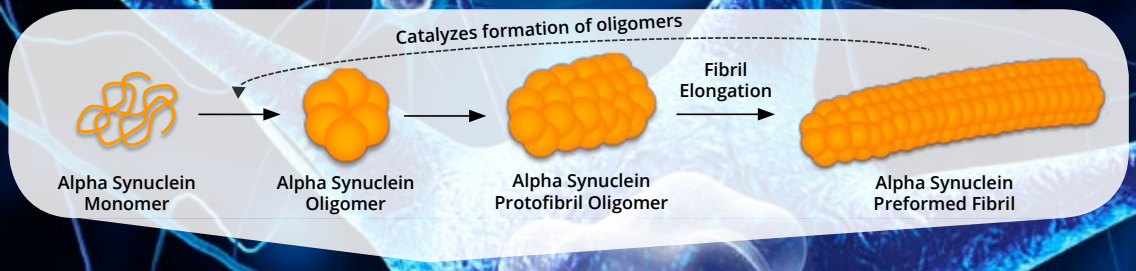
@CAN_ACN #CAN2019

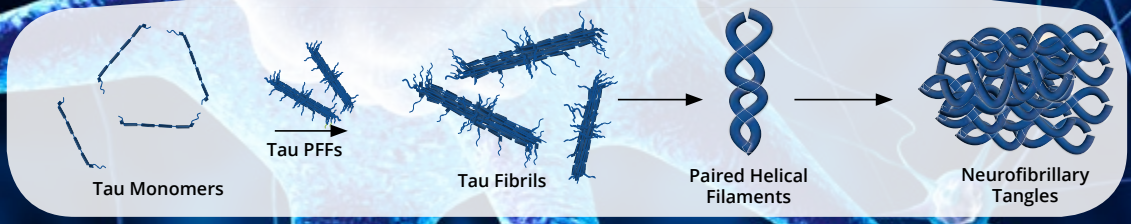
CAN.ACN

Toronto City Hall

can-acn.org

StressMarq Biosciences INC.





Alpha Synuclein & Tau

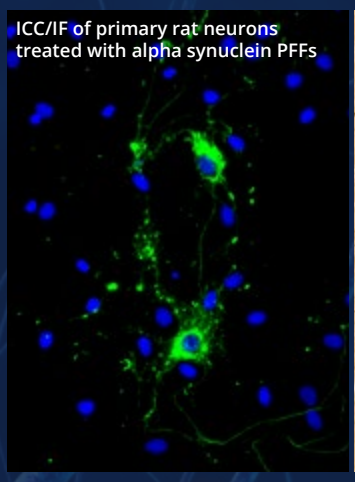
Preformed fibrils (PFFs) for neurodegeneration research

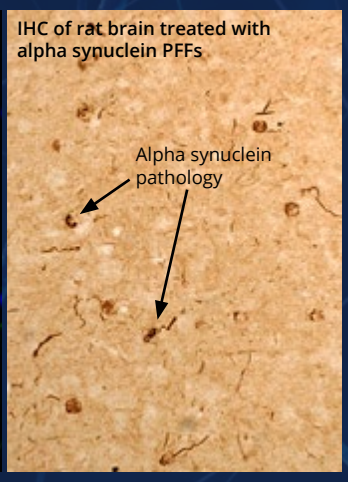
Alpha Synuclein Proteins for Parkinson's Disease Research

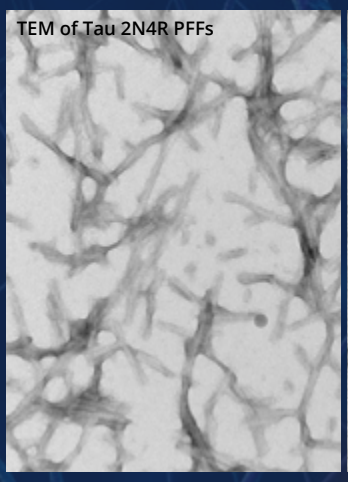
Alpha synuclein PFFs seed the formation of new fibrils from a pool of active monomers, inducing Lewy body pathology in neurons. **A53T mutant** monomers and PFFs are available.

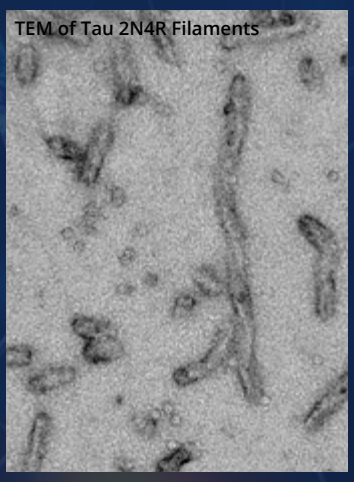
Tau Proteins for Alzheimer's Disease Research

***New* tau** PFFs cause tau monomers to aggregate into neurofibrillary tangles, leading to the tau pathology seen in Alzheimer's Disease. Monomers, PFFs, and filaments are available.









Booth #1

Find out more: www.stressmarq.com/PFFs | info@stressmarq.com | 1.250.294.9065

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LETTER FROM THE PRESIDENT

Dear Colleagues and Friends

Welcome to the 13th annual Canadian Neuroscience Meeting. The Scientific Program Committee, chaired by Dr. Paul Frankland and co-chair Dr. Ruth Slack, along with local chair Dr. Julie Lefebvre, have put together an exciting roster of scientific presentations, community building events and opportunities for networking and career development.

The CAN meeting, as always, aims to be a safe and welcoming environment for all our attendees, guests and staff. This year, with guidance from our Equity, Diversity and Inclusion committee and the Board of Directors, we have generated a statement that encapsulates the values of CAN and will help ensure a safe and positive meeting environment for all. The full statement is available on our website (https://can-acn.org/can-meeting-value-statement).

We will be hosting a luncheon on Equity, Diversity and Inclusion, and are excited to welcome Dr. Imogen Coe as expert speaker on this topic. This important event will help inform the action CAN will take to address EDI issues in coming years.

Scientific highlights of the 2019 meeting include the Presidential lecture by Dr. Robert Malenka, Keynote address by Dr. Michelle Monje and plenary lectures by Drs. Jeffrey Mogil, Florian Engert and Guo-Li Ming. The plenary symposia, featuring prominent Canadian and international speakers, and the diverse parallel symposia proposed by our members complete the CAN scientific program.

I want to warmly congratulate this year's Young Investigator laureate, Dr. Blake Richards, from the University of Toronto at Scarborough. Dr. Richards' research explores the neural basis of deep learning. The goal of this work is to better understand the neurobiological basis of animal and human intelligence and provide new insights to help guide AI development. His laboratory has made several important contributions to mathematical models of learning and memory in the brain. Don't miss the CAN Young Investigator award lecture to learn more about these exciting discoveries.

Dr. Richards will also host the CAN public lecture, which this year features a Canadian pioneer in Artificial Intelligence, Dr. Geoffrey Hinton, from the University of Toronto. This event will explore the use of artificial intelligence to understand how the brain computes.

CAN has developed important partnerships over the years which help support and expand our meeting. IBRO has been a consistent supporter of our meeting, and this year will help facilitate our efforts to increase the participation of trainees from underrepresented groups in our meeting. We are grateful for their commitment to increasing the diversity of our attendees and for expanding the range of research presented at our meeting. I also wish to thank the International Society for Developmental Neuroscience for their important support as platinum sponsors. Finally, we are excited to welcome the Lundbeck Foundation, which awards the annual Brain Prize to honour scientists who have made outstanding contributions to neuroscience. This year we will host the Brain Prize lecture by 2016 awardee Dr. Graham Collingridge from the University of Toronto.

I hope you enjoy the meeting and look forward to meeting many of you during the week.

Jaideep Bains, PhD
President of the Canadian Association for Neuroscience

Chers collègues et amis

Bienvenue au 13e congrès canadien annuel des neurosciences. Le comité du programme scientifique, présidé par Dr Paul Frankland, co-présidé par Dre Ruth Slack, et la présidente du comité local d'organisation Dre Julie Lefebvre, ont monté un programme passionnant combinant présentations scientifiques et événements de réseautage et de développement de carrière.

Comme toujours, le congrès de l'ACN vise à créer un environnement sûr et accueillant pour tous nos participants, invités et membres du personnel. Cette année, grâce aux conseils de notre comité sur l'équité, la diversité et l'inclusion et du conseil d'administration, une déclaration de valeurs de l'ACN a été rédigé pour contribuer à garantir un environnement de congrès positif et sans danger pour tous. La déclaration complète est disponible sur notre site web (https://can-acn.org/fr/declaration-de-valeurs).

Nous organisons un atelier-lunch sur l'équité, la diversité et l'inclusion (EDI), et nous sommes ravis d'accueillir la Dre Imogen Coe en tant que conférencière experte sur ce sujet. Cet événement important aidera à informer l'action que l'ACN entreprendra pour répondre aux questions portant sur l'EDI dans les années à venir.

Les points forts scientifiques du congrès 2019 incluent la conférence présidentielle du Dr. Robert Malenka, la conférence principale de la Dre Michelle Monje et les conférences plénières des Drs Jeffrey Mogil, Florian Engert et Guo-Li Ming. Les colloques pléniers réunissant des conférenciers canadiens et internationaux éminents, ainsi que les divers symposiums parallèles proposés par nos membres complètent le programme scientifique de cette année.

Je tiens à féliciter chaleureusement le lauréat du prix Jeune chercheur de l'ACN 2019, le Dr Blake Richards, de l'Université de Toronto à Scarborough. Les recherches du Dr Richards explorent les bases neuronales de l'apprentissage en profondeur (deep learning). Le but de ce travail est de mieux comprendre la base neurobiologique de l'intelligence animale et humaine et de fournir de nouvelles informations pour aider à guider le développement de l'Intelligence Artificielle (IA). Son laboratoire a fait des contributions importantes aux modèles mathématiques d'apprentissage et de mémoire dans le cerveau. Ne manquez pas la conférence du jeune chercheur de l'ACN pour en savoir plus sur ces découvertes passionnantes.

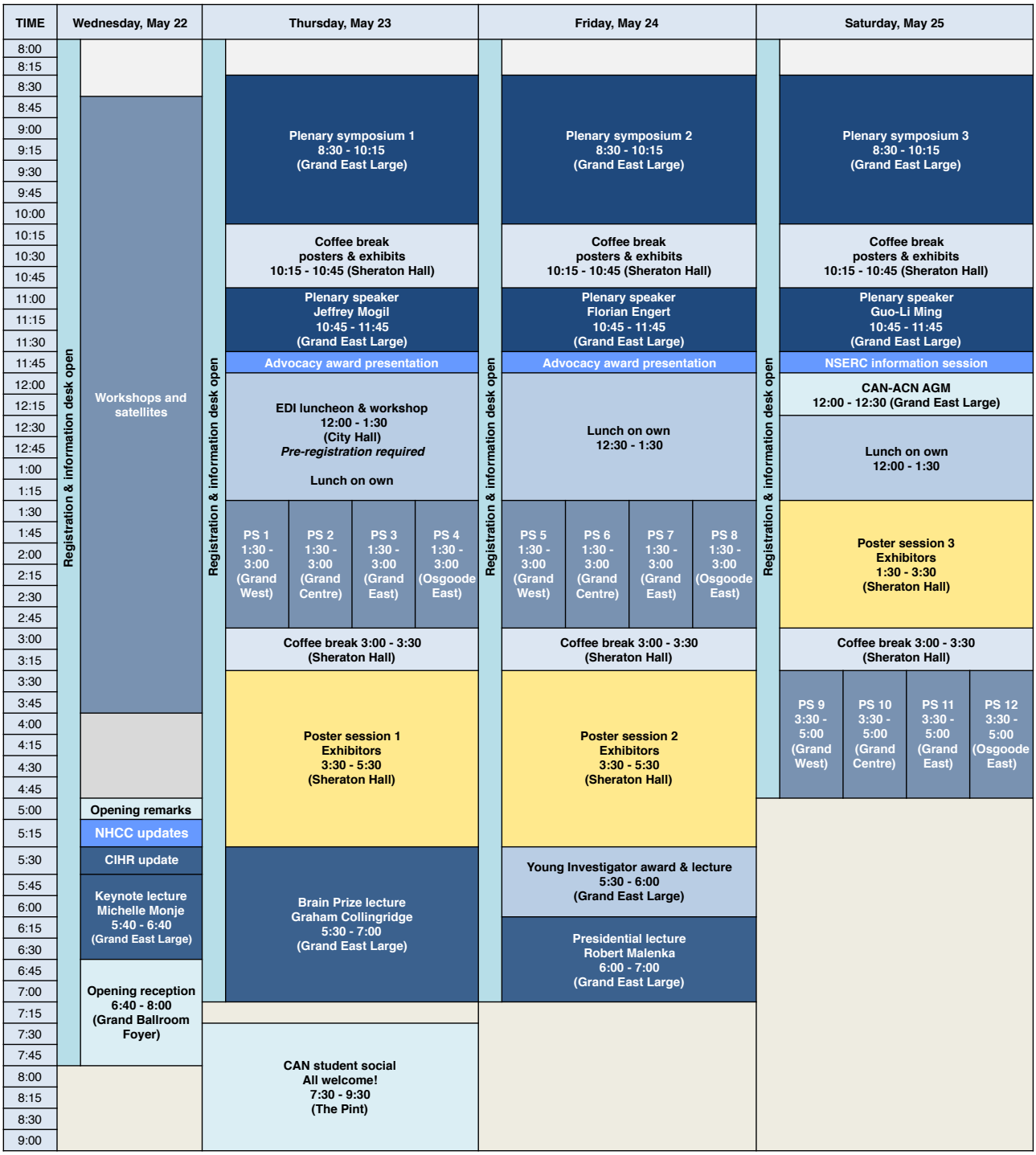
Le Dr Richards animera également la conférence publique de l'ACN, avec un pionnier canadien en intelligence artificielle, le Dr Geoffrey Hinton, de l'Université de Toronto. Cet événement explorera l'utilisation de l'IA pour comprendre le fonctionnement du cerveau.

L'ACN a développé d'importants partenariats au fil des ans, qui aident à soutenir et à élargir notre congrès. L'IBRO soutient cette année la participation des stagiaires des groupes sous-représentés à notre congrès grâce à l'attribution de bourses de voyage. Nous leur sommes reconnaissants de leur engagement à accroître la diversité de nos participants et à élargir l'éventail des recherches présentées lors de notre congrès. Je souhaite également remercier l'International Society for Developmental Neuroscience pour son soutien important en tant que commanditaire platine. Enfin, nous sommes ravis d'accueillir la Fondation Lundbeck, qui décerne le Brain Prize annuellement à des scientifiques ayant fait une contribution exceptionnelle aux neurosciences. Cette année, le Dr Graham Collingridge de l'Université de Toronto, récipiendaire du Brain Prize 2016, donnera une conférence Brain Prize à notre congrès.

J'espère que vous apprécierez le congrès et je me réjouis de pouvoir rencontrer nombre d'entre vous au cours de la semaine.

Jaideep Bains, PhD
Président de l'Association canadienne des neurosciences

PROGRAM-AT-A-GLANCE



CAN-ACN

CANADIAN ASSOCIATION FOR NEUROSCIENCE
ASSOCIATION CANADIENNE DES NEUROSCIENCES

The Canadian Association for Neuroscience is a community of scientists, researchers and students brought together with the common purpose of representing the interests of Canadian neuroscientists at national and international levels. CAN's mission is to promote communication among neuroscientists throughout Canada, and generate interest and understanding of the importance of scientific research and development.

CAN-ACN Annual Meeting

Since 2007, the Canadian Neuroscience Annual Meetings have been an important platform for researchers to present their work, generate scholarly debate, and obtain valuable feedback and be informed about the important neuroscience research done across country and abroad. This highly regarded conference is in its 13th year.

13th Annual Canadian Neuroscience Meeting 2019

Puente de Luz – "the bridge of light" in Toronto – is popularly known as "the yellow bridge."

Download the official CAN Mobile App!

Building on the well-received usage of our app, we are excited to bring you the 2019 edition of the official CAN Mobile Meeting App! The app is, once again, available as a free download for iPhone, Android, Blackberry and all tablets, and in a web version for all other web browser-enabled smartphones. Maximize your time and experience with the CAN Meeting – scan the QR code to access the app or simply search for 'Canadian Association for Neuroscience' or 'CAN ACN' to download from the app store.

The CAN app allows you to:

- View all conference information (sessions, abstracts, Presenters, exhibitors, maps, attendee profiles, etc.) on your mobile device
- Build a personalized schedule and access any session handouts
- Find information quickly with the search feature
- Opt into messaging with other attendees
- Receive important conference-related notifications and updates
- Take notes on your mobile device during specific sessions with the ability to extract the information later
- Browse local restaurants and attractions

And much more…

CAN-ACN LEADERSHIP

Elected members govern the Canadian Association for Neuroscience. These members comprise the Board of Directors who in turn elects Officers that comprise the Executive Committee. The Society's Bylaws govern how the Board manages the Society.

Executive Committee

President: **Jaideep Bains** | University of Calgary

Vice-president (President-elect): **Katalin Toth** | Université Laval

Secretary: **Alyson Fournier** | McGill University

Treasurer: **Derek Bowie** | McGill University

Treasurer-elect: **David Stellwagen** | McGill University

Board Members

Past-President & Chair of the Nominations Committee
Lynn Raymond | University of British Columbia

Chair of the Advocacy Committee:
Melanie Woodin | University of Toronto

Committee members:
Alanna Watt | McGill University
Jean-Claude Béique | Université d'Ottawa
Martin Paré | Queen's University
Shernaz Bamji | University of British Columbia
Stephanie Borgland | University of Calgary
Roger Thompson | University of Calgary
Soheila Karimi | University of Manitoba
Susanne Schmid | University of Western Ontario

2019 Scientific and Local Program Committee

Meeting Chair: **Paul Frankland** | SickKids Hospital

Co-Chair: **Ruth Slack** | University of Ottawa

Chair of the Local Organizing
Julie Lefebvre | University of Toronto

Committee Members

Rosemary Bagot | McGill University
Jean-Claude Béïque | University of Ottawa
James Fawcett | Dalhousie University
Stephanie Fulton | Université de Montréal
Michael Hendricks | McGill University
Tammy Ivanco | University of Manitoba
Martin Paré | Queen's University
Marco Prado | Western University
Maria Natasha Rajah | McGill University
Marie-Ève Tremblay | Université Laval
Ian Winship | University of Alberta

2019 Advocacy Committee

Advocacy Chair: **Melanie Woodin** | University of Toronto

Committee members:

Charles Bourque | McGill University
Liisa Galea | University of British Columbia
Kurt Haas | University of British Columbia
Christopher Anderson | University of Manitoba
Karun Singh | McMaster's University
Lisa Saksida | Western University
Nafisa Jadavji | Carleton University, Liaison to CSMB

Association secretariat & conference management
secretariat@can-acn.org

Podium Conference Specialists

Marischal De Armond
Jude Ross
Cendrine De Vis

Chief Operating & Advocacy Officer
info@can-acn.org **Julie Poupart**

Membership information

CAN membership is open to all scientists, principal investigators and students actively involved in neuroscience research from across Canada and around the world. CAN membership dues are paid annually and cover the calendar year from September 1st to August 31st.

Benefits

CAN-ACN membership includes the following benefits:

- Eligibility to submit or sponsor communications at CAN Scientific meetings
- A significant reduction on registration for our annual meeting
- Networking opportunities
- The possibility of advertising positions and meetings on the CAN-ACN website
- A forum to exchange information with colleagues and the general public
- Eligibility for CAN-ACN prizes and awards
- Members, honorary members and emeritus members, but not student members or corporate members, shall have the right to vote at any duly constituted business meeting of the Association and shall have the right to hold office in the Association.

To become a CAN-ACN Member please visit us at the registration desk today.

GENERAL CONFERENCE INFORMATION

Meeting venue

Sheraton Centre Toronto
123 Queen St W, Toronto, ON M5H 2M9
All Meeting sessions will take place in this location.

Registration

Annual Meeting registration fees include access to all sessions including panel, symposium, and poster sessions. Registration also includes 2 daily refreshment breaks.

Name badges

Your name badge is your admission ticket to the Meeting sessions, coffee breaks, and opening reception. Please wear it at all times. At the end of the Meeting we ask that you recycle your name badge in one of the name badge recycling stations that will be set out or leave it at the registration desk.

Lost name badges:
There is a $25 replacement fee for any lost or missing name badges – If you've lost your name badge, visit the registration desk for a replacement as soon as possible.

WIFI access

There is WIFI available for CAN delegates in the meeting space.
Please follow the login details below:

Network ID: **Sheraton_Conference**
Password: **CANBRC2019**

Thank you to our WIFI sponsor, **Brain Repair Centre at Dalhousie University**

Registration and information desk hours

The CAN-ACN registration and information desk, located in the Vide area, will be open during the following dates and times:

Pre-conference satellite registration

Wednesday, May 22	8:00 am to 10:00 am

CAN registration

Wednesday, May 22	10:00 am to 8:00 pm
Thursday, May 23	8:00 am to 7:00 pm
Friday, May 24	8:00 am to 6:00 pm
Saturday, May 25	8:00 am to 5:00 pm

If you need assistance during the conference, please visit the registration desk.

GENERAL CONFERENCE INFORMATION

Poster information

Set-up / removal

There are three poster sessions during the Meeting and posters have been allocated to one of the sessions based on poster themes. Poster presenters must set-up and remove their posters during the following times.

Poster session 1 – Thursday, May 23
Poster hours
10:15 am – 10:45 am
12:00 pm – 1:30 pm (lunch on own – posters will remain open)
3:30 pm – 5:30 pm
Poster set-up Thursday, May 23: 7:30 am – 8:30 am
Removal of all posters by: 7:00 pm on May 23

Sponsored by **International Society for Developmental Neuroscience (ISDN)**

Poster session 2 – Friday, May 24
Poster hours
10:15 am – 10:45 am
12:00 pm – 1:30 pm (lunch on own – posters will remain open)
3:30 pm – 5:30 pm
Poster set-up Friday, May 24: 7:30 am – 8:30am
Removal of all posters by: 7:00 pm on May 24

Sponsored by **University of Ottawa Brain and Mind Research Institute**

Poster session 3 – Saturday, May 25
Poster hours
10:15 am – 10:45 am
12:30 pm – 1:30 pm (lunch on own – posters will remain open)
1:30 pm – 5:30 pm
Poster set-up Saturday, May 25: 7:30 am – 8:30 am
Removal of all posters by: 4:00 pm on May 25

Information on poster authors, poster numbers and poster titles begin on page 55. Digital copies can be downloaded from the CAN-ACN website. Posters can also be browsed using the CAN App by downloading the app from the Apple Store/Google Play Store.

Message board

For your convenience, a message board will be located near the registration desk. Feel free to leave messages of interest to other Meeting participants.

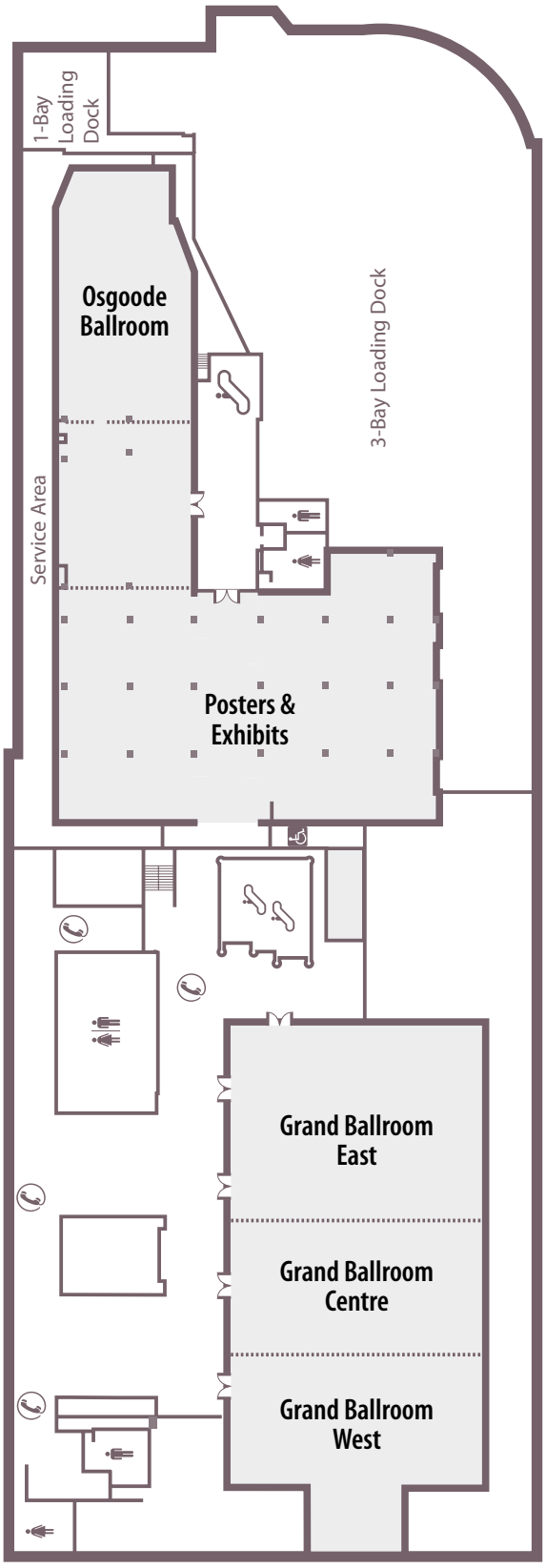
Staff

CAN-ACN staff from Podium Association & Conference Specialists can be identified by orange ribbons on their name badges. Feel free to ask anyone of our staff for assistance. For immediate assistance please visit us at the registration desk.

GENERAL CONFERENCE INFORMATION

Floor Plan

Sheraton Centre Toronto



2019 Young investigator awardee

Sponsored by **The Neuro**

Blake Richard

University of Toronto at Scarborough

The Canadian Association for Neuroscience is proud to announce that Dr. Blake Richards, from University of Toronto at Scarborough, is the winner of the 2019 CAN Young investigator award. This award recognizes his outstanding research achievements at the intersection of neuroscience and Artificial Intelligence (AI). Dr. Richards will receive this prize on May 24, 2019 in Toronto, during the 13th Annual Canadian Neuroscience Meeting.

Dr. Richards' research program focuses on neural computation, learning, and artificial intelligence (AI). Using a combination of computational modelling and advanced neuroscience and brain imaging approaches, his lab is exploring the neural basis of deep learning. The goal of this work is to better understand the neurobiological basis of animal and human intelligence and provide new insights to help guide AI development.

His laboratory has made several important contributions to mathematical models of learning and memory in the brain. These have provided new insights on the process of memory consolidation, learning in the brain and by machines, and how brain structures permit deep learning in real brains. This theoretical work has been well-recognized in both the neuroscience and AI communities, and Dr. Richards is considered a leading researcher at this disciplinary intersection. AI is currently being revolutionized with brain-inspired mechanisms.

Dr. Richards has received several awards and recognitions for his contributions. In 2016 he was awarded a Google Faculty Research award for his research on memory and reinforcement learning; in 2017 he became a Fellow of the CIFAR (Canadian Institute for Advanced Research) Learning in Machines and Brains Program; in 2018 he received an Early Career Researcher Award from the Government of Ontario; and most recently he was nominated as a Faculty Affiliate to the Vector Institute for AI. These recognitions are in addition to the funding he has received for his research from several highly competitive sources, including the Canada Foundation for Innovation, the Natural Sciences and Engineering Research Council of Canada, the Human Frontier Science Program, the Allen Institute for Brain Science, and Google. Most recently, Dr. Richards was awarded one of 29 Canada CIFAR AI Chairs as part of the Pan-Canadian AI Strategy.

In addition to his research contributions, Dr. Richards has been an active member of the neuroscience and AI communities. Together with Dr. Timothy Lillicrap from Google DeepMind, he organized a workshop on deep learning and neuroscience at the 2016 Computational and Systems Neuroscience Conference (COSYNE). He also co-organized a Canadian Institute for Advanced Research (CIFAR) Brain Symposium last year, which brought together neuroscientists and machine learning experts, and which has sparked several new, interdisciplinary collaborations in the Canadian research community. And, more recently, he helped to organize a breakout session on memory consolidation at the 2018 Cognitive and Computational Neuroscience Conference in Philadelphia. Finally, Dr. Richards is recognized, by all who have worked with him in a laboratory, as a natural leader who truly enjoys mentorship.

Dr. Richards has shared his discoveries outside the scientific community, through numerous interviews to the popular press (including The New York Times, The Independent, The BBC, and NPR), and speaking arrangements at public events such as Pint of Science and NeuroTechX. He is always engaging and easy to understand in his public appearances and can act as a great ambassador for research into the links between AI and neuroscience. He has graciously accepted to host the 2019 CAN Public lecture with Geoffrey Hinton on May 21, 2019 in Toronto.

Dr. Blake Richards is an exceptional young investigator, whose work seamlessly integrates advanced neuroscience, neuroimaging, computational and artificial intelligence approaches to advance our understanding of the brain, but also to contribute to the development of artificial intelligence. The Canadian Association for Neuroscience is very proud to name him the 2019 CAN Young Investigator.

Abstract

Credit assignment via spike-based causal inference

Learning in neural circuits requires a means of assigning "credit" to each neuron for its contribution to behaviour. In hierarchical circuits, like the neocortex, credit assignment is challenging, because a neuron's contribution to behaviour depends on its impact on downstream circuits, which may involve multiple synaptic connections and pathways. One way of understanding this challenge is in analogy to the causal inference question faced by many researchers: how can we determine the causal impact of one variable on another when there are many potential interactions and many uncontrolled variables? In this talk, I will discuss modelling work from my group that was inspired by causal inference tools from economics. These tools use discontinuities in a variable to infer causal relationships, even when most variables in the system cannot be controlled for. I will show how the discontinuity introduced by action potentials can be used by neurons to estimate their causal impact on downstream circuits. Furthermore, I will show how this could help neurons to solve the credit assignment problem. I will end with a discussion of the predictions generated by this model of learning in the brain, in order to provide experimentalists with a means of testing these ideas.

Advocacy award presentations

THURSDAY, MAY 23

CAN ADVOCACY & OUTREACH AWARD

Ottawa Chapter of the Society for Neuroscience

The Ottawa SfN Chapter's activities included the organization of outreach educational events, community fundraisers, and academic and community knowledge transfer. A group of 17 very motivated students that recruited volunteers from Carleton University and the University of Ottawa organized these events. The SfN Ottawa chapter has had a significant impact in science promotion in the Ottawa region for a number of years, and was awarded the 2018 Chapter of the year award from the Society for Neuroscience for these efforts.

https://can-acn.org/the-ottawa-sfn-chapter-wins-a-2019-can-neuroscience-outreach-advocacy-award

FRIDAY, MAY 24

CAN ADVOCACY & OUTREACH AWARD

SINAPSE
(Service and Outreach Initiatives for Progressive and Positive Neuroscience)

"Synapse" means to connect. A group of undergraduate and graduate students at Memorial University of Newfoundland's Psychology Department, and their mentor, have given this perennial word a richer meaning. Joshua Conway, Shannon Waye, Nageeb Hasan, Courtney Clarke, Rachel Noel, Tristian Critch and Brad Furlong, with the guidance and direction of their mentor and assistant professor, Dr. Francis Bambico, founded a neuroscience-driven advocacy team called Service and Outreach Initiatives for Progressive and Positive Neuroscience or SINAPSE in short. SINAPSE has allowed this group of students to connect far, beyond the walls of their laboratory at Memorial University.

https://can-acn.org/sinapse-2019-can-outreach-and-advocacy-award

SPECIAL MEETINGS & SOCIAL EVENTS

TUESDAY, MAY 21, 2019

6:30 – 8:00 pm
SickKids
Peter Gilgan Centre for Research and Learning Auditorium

CAN 2019 public lecture

Does the brain do backpropagation?

Location: **SickKids Peter Gilgan Centre for Research and Learning Auditorium**

Geoffrey Hinton | University of Toronto

Host: **Blake Richards** | University of Toronto

WEDNESDAY, MAY 22, 2019

5:40 – 6:40 pm
Grand East

Keynote lecture

Sponsored by **The SickKids Centre for Brain & Mental Health** and **The Hospital Sick Children Research Institute**

Michelle Monje | Stanford University
Myelin plasticity in health and disease

6:40 – 8:00 pm
Grand Foyer

Opening reception

Join us to catch up with friends and colleagues to start off the annual meeting

THURSDAY, MAY 23, 2019

12:00 – 1:30 pm
City Hall Room

Equity, diversity and inclusivity in neuroscience workshop & lunch

(limited attendance, must be pre-registered)

5:30 – 7:00 pm
Grand East

Brain Prize lecture

Graham Collingridge | University of Toronto
The Molecular basis of Hebb synapses

Introduction by **Kim Krogsgaard** | Director of The Brain Prize at Lundbeck Foundation
Supported by **Lundbeck Foundation**

7:30 – 9:30 pm
The Pint

CAN Student Social

Supported by **Neurolabware**

FRIDAY, MAY 24, 2019

6:00 – 7:00 pm
Grand East

Presidential lecture

Robert Malenka | Stanford University
Neural mechanisms of social reward
Supported by **Hotchkiss Brain Institute**

CAN-ACN PRE-CONFERENCE EVENTS

Each year, the opportunity for like-minded groups to hold a Satellite Meeting at CAN-ACN is offered. This year, CAN-ACN is pleased to offer the following satellite meetings. If you or a group you are involved in are interested in holding a satellite meeting at future CAN-ACN meetings, please stop by the registration desk to speak to a member of the planning team.

Please note: pre-registration is required for all pre-conference events

WEDNESDAY, MAY 22

12:30 – 4:30 pm
Sheraton Centre Toronto
Osgoode East

Workshop 1
SfN – CAN Advocacy workshop

Organisers: **The Society for Neuroscience (SfN)** & **the Canadian Association for Neuroscience (CAN)**

Advocacy training: Be an effective advocate for science: Be involved & tell your story

SfN and CAN join forces to bring you advocacy training that explains:

- Why advocacy matters
- How you can make an impact
- How informing lawmakers can advance neuroscience priorities
- How the Canadian budget process works
- How SfN and CAN can be your resource
- How to plan a #neuroadvocate activity

Speakers:

Michael Heintz | Director of Advocacy & Training at Society for Neuroscience

Melanie Woodin | Chair of the CAN advocacy committee

Julie Poupart | CAN Advocacy Officer

8:30 am – 12:00 pm
Sheraton Centre Toronto
Osgoode East

Workshop 2
Science management symposium @ CAN-ACN 2019

Session chair:

Randy McIntosh | Senior Scientist, Rotman Research Institute – Baycrest Hospital

The landscape of scientific research is changing. Today's researchers need to participate in large-scale collaborations, obtain and manage funding, share data, publish, and undertake knowledge translation activities in order to be successful. As per these increasing demands, Science Management is now a vital piece of the environment. This panel discussion will host area experts whom have extensive experience with management in a science setting. We will also present practical techniques, tools and project management skills that participants can begin to implement.

Our goal is to motivate participants to regard Science Management as an essential component to their research workflow and begin to integrate formalized project management into their regular practise.

Speakers:

Jordan Antflick | Manager of Knowledge Translation, Ontario Brain Institute (OBI)

Tanya Brown | Program Manager, The Virtual Brain

Mojib Javadi | Scientific Program Development Manager, Indoc Researc

Helena Ledmyr | Deputy Director, Development and Communications, INCF

Christa Studzinski | Manager of Research Programs, Ontario Brain Institute (OBI)

CAN PRE-CONFERENCE EVENTS

WEDNESDAY, MAY 22

8:30 am – 4:30 pm
Sheraton Centre Toronto
Grand Centre

Satellite symposium 1
Neural stem cells in development and disease modeling

Thank you to our sponsor **STEMCELL Technologies Inc. , Cervo** and **SickKids**

Organisers:

Armen Saghatelyan | CERVO Brain Research Center
David Kaplan | Hospital for Sick Children
Freda Miller | Hospital for Sick Children
Karun Singh | McMaster University

Neural stem cells (NSCs) generate neurons and glia during brain development and can be used to model and understand neurodevelopmental disorders. The objective of this satellite event is to bring together Canadian experts and trainees working in the fields of NSC and neurodevelopmental disorders to exchange ideas and initiate collaborative projects. This satellite is an outgrowth of agreed-upon next steps from the successful NSC satellite meeting at last year's CAN meeting, including the use of model organisms to study NSC function (session 1), adoption of the latest cutting-edge techniques and approaches to study NSC biology including single cell transcriptomics (session 2) and the use of human induced pluripotent stem cells to understand and model human neurodevelopmental disorders (session 3). We expect that this meeting will strengthen the Canadian stem cell community by connecting researchers in the model organism, neurodevelopment and neurodevelopmental disorder fields who do not regularly interact.

Speakers

Bret Pearson | SickKids
Deborah Kurrasch | University of Calgary
Ruth Slack | University of Ottawa
Diane Lagace | University of Ottawa
Karun Singh | McMaster
Kym Boycott | CHEO, University of Ottawa
Vince Tropepe | University of Toronto
Jeff Biernaskie | University of Calgary
Guang Yang | University of Calgary
Scott Yuzwa | University of Toronto
Julien Muffat | SickKids
James Ellis | SickKids

TUESDAY, MAY 21 (5:00PM KEYNOTE LECTURE) & WEDNESDAY, MAY 22

9:00 am – 4:30 pm
Sheraton Centre Toronto

Satellite symposium 2
7th Annual Canadian Neurometabolic Club Meeting

Please note:

Evening keynote May 21, 5:00pm - 7:00pm, Cedar Room
Satellite May 22, 9:00am - 4:30pm, Grand West

Organiser: **Stephanie Fulton** | Université de Montréal & CRCHUM

The CNS plays an essential role in the regulation of energy balance. Peripherally-derived nutrients and metabolic signals have a critical influence on neural metabolism and signalling to modulate behavioural, neuroendocrine and autonomic processes. Excessive intake of foods rich in fat and/or sugar and sedentary lifestyle underlie the prevalence of obesity and associated neuropathologies (psychiatric, degenerative, developmental). Understanding the interactions between diet, physical activity, metabolism and nervous system function is of utmost importance.

The Canadian Neurometabolic Club meeting welcomes all scientists interested in brain-metabolism interplay. The objective of the meeting is to provide a platform for trainees to present their research, in the form of short a talk or poster, and to foster interactions and exchange amongst PIs and trainees.

Keynote: **Lori Zelster, PhD** | Columbia University
Genetic influences on eating disorder risk + trainee presentations from selected abstracts

WEDNESDAY, MAY 22

All Day
Sheraton Centre Toronto
Dufferin/Simcoe

Satellite symposium 3
Canadian Neurophotonics Platform

Thank you to our sponsor **Bliq Photonics**

Organiser:

Jean-Claude Béique | University of Ottawa, for the Canadian Neurophotonics platform

An all-day short course to articulate new methods and applications of light microscopic imaging and optogenetic manipulation of nervous system tissues. Optogenetics topics include: optogenetic probe development, optogenetic activation and inhibition, with emphasis on region selective expression, light, and probe delivery. Imaging topics include: in vivo approaches (2-photon fast scanning, wide-field), super-resolution imaging, and methodologies for assessing the structure and function of large brain networks. Data analysis topics include visualization of activity in large networks, and image processing strategies to improve light microscopic images.

TUESDAY, MAY 21 & WEDNESDAY, MAY 22

All Day
Ryerson Science Discovery Zone,
44 Gerrard St. E,
Toronto, Ontario, M5B 1G3

Satellite symposium 4
Brainhack Canadian Neuroinformatics: Data modeling and interoperability

Organisers:

BrainHack Toronto Chairs: **Erin W Dickie** & **Sean Hill**

Affiliation:

Krembil Centre for Neuroinformatics, Center for Addiction and Mental Health;
Rotman Research Institute, Baycrest Health Sciences

Thank you to our sponsors: **Ontario Brain Institute** & **Ryerson Biomedical Zone**

SUNDAY, MAY 26

9:00 am – 5:00 pm
Offsite at York University campus,
Toronto ON.
(subway stop: York University)

Satellite symposium 5
CAPnet CAN-ACN Satellite symposium "Perception and action: Integration, computation and application"

Program committee:

Denise Henriques | York University (co-chair)
Steven Prime | University of Saskatchewan
Perez Freud | York University
Aarlenne Khan | University of Montreal (co-chair)
Erin Cressman | University of Ottawa
Claudia Gonzalez | University of Lethbridge

MONDAY, MAY 20 & TUESDAY, MAY 21

All Day
SickKids building (686 Bay St),
Toronto

Satellite symposium 6
Neural signal and image processing: Quantitative analysis of neural activity

Organizers:

Majid Mohajerani | University of Lethbridge
Artur Luczak | University of Lethbridge
Steve Prescott | University of Toronto

ANNUAL CONFERENCE SCHEDULE

Overviews of all keynotes, plenary and parallel symposia can be found starting page 24

WEDNESDAY, MAY 22

5:00 – 5:15 pm Grand East
Welcome and opening remarks
Jaideep Bains | President of the Canadian Association for Neuroscience

5:15 – 5:25 pm Grand East
News from CIHR's Institute of Neurosciences, Mental Health and Addiction
Sam Weiss | Scientific Director, CIHR Institute of Neurosciences, Mental Health and Addiction

5:25 – 5:40 pm Grand East
Neurological Health Charities of Canada
Deanna Groetzinger

5:40 – 6:40 pm Grand East
Keynote lecture
Sponsored by **The SickKids Centre for Brain & Mental Health** and **The Hospital Sick Children Research Institute**

Michelle Monje | Stanford University
Myelin plasticity in health and disease

6:40 – 8:00 pm Grand Foyer
Opening reception

THURSDAY, MAY 23

8:30 – 10:15 am Grand East
Plenary symposium 1
Pain: More than a feeling

Chair: **Tuan Trang** | University of Calgary

Catherine Cahill | UCLA
Intersection between pain and addiction: Implications for kappa receptors

Laura Stone | McGill University
Pain Epigenetics: What is it and why should anyone care?

Loren Martin | University of Toronto
Learning mechanisms of pain and pain relief

10:15 – 10:45 am Sheraton Hall
Coffee break posters/exhibits

10:45 – 11:45 am Grand East
Featured plenary speaker
Jeffrey Mogil | McGill University
Pain in mice and man: Ironic adventures in translation

11:45 – 12:00 pm Grand East
Advocacy Award winner 1 presentation

12:00 – 1:30 pm **Lunch on own**

City Hall Room ***Equity, diversity and inclusion luncheon***

Sponsored by **BrainsCAN**

Dr. Imogen Coe | Ryerson University

Embedding Equity, Delivering Diversity, Saving Science

1:30 – 3:00 pm **Parallel symposium 1**

Grand West ***Peripheral and central mechanisms of sensory information processing***

Sponsored by **the Djavad Mowafaghian Centre for Brain Health**

Chair: **Michael Gordon** | University of British Columbia

Gautam Awatramani | University of Victoria

Precise subcellular coordination of excitation and inhibition supports micron-scale dendritic computations

Molly Stanley | University of British Columbia

Unique properties of salt taste coding and state-dependent behavioral output in Drosophila

Stuart Trenholm | McGill University

Flexible feature encoding in visual cortex

Maurice Chacron | McGill University

Mechanisms underlying adaptive optimized coding of natural stimuli

Grand Centre **Parallel symposium 2**

The neural basis for social decision-making

Chairs: **Toni-Lee Sterley** | University of Calgary & **John P. Christianson** | Boston College

Brian Trainor | UC Davis

Oxytocin in the bed nucleus of the stria terminalis facilitates social anxiety

Toni-Lee Sterley | University of Calgary

The role of corticotropin-releasing hormone neurons in the paraventricular nucleus of the hypothalamus in social transmission of stress

Morgan Rogers-Carter | Boston College

Insular cortex projections to nucleus accumbens core mediate social approach

Zoe Donaldson | University of Colorado Boulder

Neuronal signature of monogamous reunion in prairie voles

Grand East

Parallel symposium 3

Neural stem cells in neural development and repair

Sponsored by **International Society for Developmental Neuroscience (ISDN)**

Chair: **Soheila Karimi** | University of Manitoba

Carol Schuurmans | University of Toronto
Elucidating the molecular control of neural stem cell maintenance in the embryonic neocortex

Jeff Biernaskie | University of Calgary
Clarifying the identity of adult neural stem cells

Anastassia Voronova | University of Alberta
Role of interneuron-secreted signals in neural stem cell-mediated oligodendrocyte genesis in the developing and adult brain

Soheila Karimi | University of Manitoba
Novel mechanisms of neural stem cell regulation in spinal cord injury

Osgoode East

Parallel symposium 4

Circuit and synaptic approaches to study stress | depression and antidepressants

Sponsored by **CERVO Brain Research Centre**

Chair: **Argel Aguilar Valles** | Carleton University

Wataru Inoue | University of Western Ontario
Intrinsic plasticity as a neural correlates for stress habituation

Mary Kay Lobo | University of Maryland
Molecular mediators of dendritic atrophy regulate stress susceptibility

Anita Autry | Howard Hughes Medical Institute
Impact of stress on parental behavior: Potential insights for post-partum mental illness

Argel Aguilar Valles | Carleton University
Translational control of the antidepressant effect of ketamine and its metabolite hydroxynorketamine

3:00 – 3:30 pm
Sheraton Hall

Coffee break posters/exhibits

3:30 – 5:30 pm
Sheraton Hall

Poster session 1 & exhibits

Sponsored by **International Society for Developmental Neuroscience (ISDN)**

5:30 – 7:00 pm
Grand East

Brain Prize lecture

Graham Collingridge | University of Toronto
The Molecular basis of Hebb synapses

Introduction by **Kim Krogsgaard, Director of The Brain Prize at Lundbeck Foundation**

Sponsored by Lundbeck Foundation

7:30 – 9:30 pm
The Pint Public House
(see map in CAN app)

CAN student social

277 Front St. W, Toronto, ON, M5V 2X4

Sponsored by **Neurolabware**

FRIDAY, MAY 24

8:30 – 10:15 am | Grand East

Plenary symposium 2

Underlying principles of animal behaviors

Lunenfeld-Tanenbaum Research Institute
Sinai Health System

Sponsored by **Lunenfeld-Tanenbaum Research Institute**

Chair: **Mei Zhen** | University of Toronto

Marla Sokolowski | University of Toronto
Unravelling gene-environment interplay on behaviour

Simon Chen | University of Ottawa
Dissecting neural circuits underlying delayed motor learning in the 16p11.2 deletion mouse model of autism

Sarah Woolley | McGill University
Plasticity of acoustic preferences in female songbirds

10:15 – 10:45 am | Sheraton Hall

Coffee break posters/exhibits

10:45 – 11:45 am | Grand East

Featured plenary speaker

Florian Engert | Harvard University
Neural correlates of perceptual decision-making in larval zebrafish

11:45 – 12:00 pm | Grand East

Advocacy Award winner 2 presentation

12:00 – 1:30 pm

Lunch on own

1:30 – 3:00 pm | Grand West

Parallel symposium 5

Emotions and behavioural responses in normal and pathological states

Sponsored by **Tucker-Davis Technologies**

TUCKER-DAVIS TECHNOLOGIES

Chair: **Christophe Proulx** | Université Laval

Christophe Proulx | Université Laval
Role of lateral hypothalamus neural outputs in behavioural responses

Erin Calipari | Friedman Brain Institute
Neural circuit control of sex-differences in valence-based decision making

Bo Li | Cold Spring Harbor Laboratory
Ventral pallidal neurons in reward seeking and punishment avoidance

Stephan Lammel | UC Berkeley
Anatomical, molecular and functional heterogeneity of the lateral habenula defines a distinctive depression subtype

Grand Centre

Parallel symposium 6

Novel approaches to understanding genetic underpinnings of Autism Spectrum Disorder

Sponsored by **International Society for Developmental Neuroscience (ISDN)**

Chair: **Catharine Rankin** | University of British Columbia

Melanie Woodin | University of Toronto
Regulation of KCC2 as a target for treatment of Autism

Karun Singh | McMaster University
Using integrative proteomics to identify Autism spectrum disorder signaling networks in mammalian models

Catharine Rankin | University of British Columbia
Systematic phenomics analysis of ASD-associated genes defines novel shared and unique functions and identifies parallel genetic networks underlying hypersensitivity and impaired habituation

Kurt Haas | University of British Columbia
A multi-model system approach to functional variomics of ASD-associated missense mutations of PTEN

Grand East

Parallel symposium 7

Atypical roles for NMDA receptors in physiology and disease

Sponsored by **CERVO Brain Research Centre**

Chair: **Roger Thompson** | University of Calgary

Per Jesper Sjöström | McGill University
Unorthodox NMDA receptor signalling in neocortical plasticity

Kim Dore | UC San Diego
Metabotropic NMDA receptor signaling underlies synaptic depression and dysfunction

Robert Bonin | University of Toronto
Non-canonical NMDA signaling in pain plasticity and reconsolidation

Laura Palmer | University of Calgary
A surprising neuroprotective role for amyloid beta during ischemia

Osgoode East

Parallel symposium 8

Multi-species approaches to the mammalian social brain

Chair: **Nathan Insel** | University of Montana

Annaliese Beery | Smith College
Life in groups: Selectivity and reward in vole relationships

Melissa Holmes | University of Toronto
Social influences on development in naked mole-rats

Nathan Insel | University of Montana
Investigating social learning in degus

Michael Yartsev | UC Berkeley
Neurobiological investigation of vocal production in the social mammalian brain

3:00 – 3:30 pm
Sheraton Hall

Coffee break posters/exhibits

3:30 – 5:30 pm Sheraton Hall
Posters session 2 & exhibits
Sponsored by **University of Ottawa Brain and Mind Research Institute**

5:30 – 6:00 pm Grand East
Young investigator lecture
Blake Richard | University of Toronto at Scarborough
Credit assignment via spike-based causal inference
Sponsored by **The Neuro**

6:00 – 7:00 pm Grand East
Presidential lecture
Robert Malenka | Stanford University
Neural mechanisms of social reward
Sponsored by **Hotchkiss Brain Institute**

SATURDAY, MAY 25

8:30 – 10:15 am Grand East
Plenary symposium 3
Stem cells and Organoids: Developmental mechanisms, aging and disease modeling
Sponsored by **International Society for Developmental Neuroscience (ISDN)**
Chair: **Armen Saghatelyan** | Université Laval

Armen Saghatelyan | Université Laval
Division of stem cells in freely behaving mice: Dynamic and regulatory mechanisms

David Kaplan | SickKids Hospital
Growth factor regulation of neural stem cells in normal and pathological conditions

Yun Li | SickKids Hospital
Modeling neural development and disorders in human neurons and brain organoids

10:15 – 10:45 am Sheraton Hall
Coffee break posters/exhibits

10:45 – 11:45 am Grand East
Featured plenary speaker
Guo-Li Ming | University of Pennsylvania
Modeling human brain development and developmental diseases using hiPSCs

11:45 – 12:00 pm Grand East
NSERC information session

12:00 – 12:30 pm Grand East
CAN-ACN Annual General Meeting of members

12:30 – 1:30 pm
Lunch on own

1:30 – 3:30 pm Sheraton Hall
Poster session 3 & exhibits

3:30 – 5:00 pm **Parallel symposium 9**

Grand West

Heterogeneous mechanisms underlying hippocampal synaptic plasticity

Sponsored by **CERVO Brain Research Centre**

Chair: **Timothy Kennedy** | MNI | McGill University

Anne McKinney | McGill University
Lysosomal inhibition rescues hippocampal neuronal plasticity impaired by a Christianson Syndrome mutation in SLC9A6

Elizabeth Chan | Brain Research Centre | University of British Columbia
The role of netrin 1-DCC signaling in regulating GABAAR homeostatic plasticity

Stephen Glasgow | MNI | McGill University
Guiding synaptic plasticity: A novel role for netrin-1 in the adult hippocampus

Jean-Claude Beique | University of Ottawa
Homeostatic control of plasticity rules at CA1 synapses

Grand Centre

Parallel symposium 10

Growing up high: Neurobiological consequences of adolescent cannabis use

Sponsored by **International Society for Developmental Neuroscience (ISDN)**

Chair: **Jibran Khokhar** | University of Guelph

Patricia Conrod | Université de Montréal
Longitudinal relationship between adolescent cannabis use and cognitive development

Steven Laviolette | University of Western Ontario
Adolescent THC exposure induces molecular and neuronal neuropsychiatric endophenotypes in the mesocorticolimbic circuitry

Iris Balodis | McMaster University
The neurobiology of effort-based decision-making in cannabis use disorder

Jibran Khokhar | University of Guelph
Long-term consequences of adolescent cannabinoid exposure: A closer look at learning and circuitry

Grand East

Parallel symposium 11

Novel ventral hippocampus circuits in the control of affective behavior

Chair: **Maithe Arruda Carvalho** | University of Toronto Scarborough

Christoph Anacker | Columbia University
Hippocampal neurogenesis and stress resilience

Rutsuko Ito | University of Toronto Scarborough
Ventral hippocampal contributions to learned approach-avoidance conflict processing

Mazen Kheirbek | University of California San Francisco
Encoding of emotionally relevant stimuli in ventral hippocampal circuits

Maithe Arruda-Carvalho | University of Toronto Scarborough
Maturation of brain circuits involved in emotional learning

Osgoode East

Parallel symposium 12

Single-cell transcriptomic approaches for dissecting neurological disease and complex behaviours

Sponsored by **the Djavad Mowafaghian Centre for Brain Health**

Djavad Mowafaghian
CENTRE FOR BRAIN HEALTH

Chair: **Shreejoy Tripathy** | University of Toronto

Vilas Menon | Allen Institute for Brain Science
Single-cell RNA-seq identifies putative human brain cell types associated with neurodegenerative disease

Shreejoy Tripathy | University of Toronto
Using single-cell transcriptomics to infer multi-modal cellular phenotypes

Megan Crow | Cold Spring Harbor Laboratory
Mapping transcriptomically-similar cell types across datasets, species, and conditions using MetaNeighbor

Mark Cembrowski | University of British Columbia
Subtype-specific predisposition of granule cell participation in hippocampal processing

END OF MEETING

Wondered what career opportunities await you after your PhD or post-doc?
Interested in exploring different career paths?

Come to the **Careers Networking Event** at the CAN Student Social!

Thursday May 23 7:30-9:30 pm
The Pint, 277 Front Street West, Toronto

If you are interested in exploring what career paths are available to you after graduate school, we have gather a group of more than 10 experts who have taken different career trajectories after their scientific training. Experts include:

Mark Aurousseau
CTO & Co-founder
eNUVIO

Chris Tait
Consultant
Boston Consulting Group

Keeley Rose
Project Manager
CIHR

Stuart Trenholm
Assistant Professor
McGill

Lindsay Borthwick
Independent journalist
LABmedia

Graeme Moffat
Chief Scientist & VP Regulatory Affairs
Interaxon

INTERNATIONAL BRAIN IBRO RESEARCH ORGANIZATION

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- *Fellowships for MBL and Cold Spring Harbor Summer Courses*
- *Travel awards for trainees to attend CAN meetings*
- *International Neuroscience Teaching Fellowships for Canadian PhD students as part of the Canadian-IBRO School for Neuroscience*
- *Visiting Scholar seminar speaker awards*
- *Initiative to promote First Nations trainees in Neuroscience in Canada*

For more info check: https://ibro.org/us-canada/

WEDNESDAY, MAY 22

5:40 – 6:40 pm
Grand East

Keynote lecture

Myelin plasticity in health and disease

Sponsored by **The SickKids Centre for Brain & Mental Health**
and **The Hospital Sick Children Research Institute**

Michelle Monje | Stanford University

Neuronal activity regulates the proliferation and differentiation of oligodendrocyte precursor cells during development and in adulthood. In the healthy brain, this results in activity-regulated plasticity of myelin microstructure and subsequent modulation of neural circuit function evident in oligodendrogenesis-dependent behavioral changes. The robust mitogenic effect of neuronal activity on normal neural precursor and oligodendroglial precursor cells, a putative cellular origins of high-grade glioma (HGG), suggests that dysregulated or "hijacked" mechanisms of myelin plasticity might similarly promote proliferation in this devastating group of brain cancers. Using in vivo and in situ optogenetic techniques together with patient-derived high-grade glioma cell cultures and xenograft models, we have demonstrated that active neurons similarly promote proliferation and growth of both pediatric and adult high-grade glioma subtypes. Crucial mechanisms mediating activity-regulated high-grade glioma growth include secretion of Brain Derived Neurotrophic Factor (BDNF) and the synaptic protein neuroligin-3 (NLGN3), which induces multiple oncogenic signaling pathways together with robust changes in synaptic gene expression in glioma cells. Nlgn3 is necessary for the growth of high-grade glioma xenografts in the mouse brain, and NLGN3 expression levels in human HGG negatively correlate with patient overall survival. Thus, neuronal activity not only modulates the structure and function of the brain's myelinated infrastructure, but neurons also play an important role in the brain tumor microenvironment, with activity-regulated secretion of NLGN3 emerging as an unexpected mechanism underlying axon-glioma interactions and promoting neuronal activity-regulated cancer growth.Sponsored by the International Society for Neurochemistry

8:30 – 10:15 am
Grand East

Plenary symposium 1

Pain: More than a feeling

Chair: **Tuan Trang** | University of Calgary
Presenters:

Intersection between pain and addiction: Implications for kappa receptors

Catherine Cahill | UCLA

Pain is a multidimensional experience and negative affect, or how much the pain is "bothersome", significantly impacts the sufferers' quality of life. It is well established that the kappa opioid system contributes to depressive and dysphoric states, but whether this system contributes to the negative affect precipitated by the occurrence of chronic pain remains tenuous. Using a model of persistent pain, we show by quantitative RT-PCR, florescence in situhybridization, western blotting and GTPgS autoradiography an upregulation of expression and the function of kappa opioid receptors (KORs) and its endogenous ligand dynorphin in the mesolimbic circuitry in animals with chronic pain compared to surgical controls. Using in vivo microdialysis and microinjection of drugs into the mesolimbic dopamine system, we demonstrate that inhibiting KORs reinstates evoked dopamine release and reward related behaviors in chronic pain animals. Chronic pain enhanced KOR agonist-induced place aversion in a sex-dependent manner. Using various place preference paradigms, we show that activation of KORs drives pain aversive states in male but not female mice. However, KOR antagonist treatment was effective in alleviating anxiogenic and depressive affective-like behaviors in both sexes. Finally, ablation of KORs from dopamine neurons using AAV-TH-cre in KORloxP mice prevented pain-induced aversive states as measured by place aversion assays. Our results strongly support the use of KOR antagonists as therapeutic adjuvants to alleviate the emotional, tonic-aversive component of chronic pain, which is argued to be the most significant component of the pain experience that impacts patients' quality of life. The impact of our study is broadly relevant to affective disorders associated with disruption of reward circuitry and thus likely contributes to many of the devastating sequelae of chronic pain, including the poor response to treatment of many patients, debilitating affective disorders (other disorders including anxiety and depression that demonstrate high co-morbidity with chronic pain) and substance abuse. Indeed, co-existing psychopathology increases pain intensity, pain-related disability and effectiveness of treatments.

Pain Epigenetics: What is it and why should anyone care?

Laura Stone | McGill University

The emerging field of pain epigenetics will be introduced, and the potential implications of this new field will be reviewed. Long-term programming of gene expression is dynamically regulated by chemical modifications to the DNA and histones collectively referred to as epigenetic modifications. Epigenetic changes are responsive to the environment and have long-lasting biological consequences. For example, early life neglect results in altered DNA methylation in the brain that are associated with maladaptive behavioural patterns in the adult. Evidence of epigenetic dysregulation in pre-clinical pain models and in individuals with low back pain will be highlighted. Finally, the potential for epigenetics to understand biological mechanisms, to unmask new therapeutic targets and as biomarkers for chronic pain will be discussed.

Learning mechanisms of pain and pain relief

Loren Martin | University of Toronto

In humans, the cognitive processes of how an individual processes expectations and integrates different psychological elements plays an important role in shaping pain perception. For instance, in the clinic, when pain is anticipated, patients often report heightened pain sensations. Thus, behaviours associated with pain may not be intrinsic to the stimulus of pain, but may be a response to cognitive processing and external cues. Throughout this talk, I will describe novel animal models that we have been using to study the influence of conditioning on the 'memory for pain' and the 'relief of pain. We have also made considerable efforts within this domain to translate these findings to people. Further, our recent data show that targeted inhibition of 'memory-related' proteins abolishes contextual pain memory in mice and through the use of pharmacological learning, we have shown that mice learn to associate environmental cues with pain-relief. The expectation of pain-relief activates specific neural patterns that are strikingly similar to the placebo response. These models provide a new means for studying the relationship between pain and memory by examining the influence of cognitive and pharmacological reinforcers, which will greatly enhance our understanding of the top-down modulation of pain processing.

10:45 – 11:45 am

Grand East

Featured plenary speaker

Pain in mice and man: Ironic adventures in translation

Jeffrey Mogil | McGill University

Recent decades have seen an explosion in our understanding of the molecular and cellular underpinnings of pain, but this knowledge has not resulted in many new clinical therapies. The first part of the talk will explore the reasons for this poor translation, which I believe follow from mismatches between clinical epidemiology and preclinical subject and experimental design choices. The second part of the talk will focus on recent studies in our laboratory concerning the modulation of pain by social factors. One would imagine these would be even harder to translate into humans, but in this domain translation between mice and undergraduates has been surprisingly successful. These observations collectively challenge assumptions commonly made about the biopsychosocial model and have important philosophical implications for animal research.

5:30 – 7:00 pm

Grand East

Brain Prize lecture

The Molecular basis of Hebb synapses

Sponsored by **Lundbeck Foundation**

Graham Collingridge | University of Toronto

Seventy years ago, Donald Hebb proposed that an increase in synaptic efficacy arose when a presynaptic neuron persistently activated a postsynaptic neuron (Hebb, 1949). Hebbian synapses were shown to exist with the discovery of long-term potentiation (LTP) in the hippocampal formation. NMDA-type glutamate receptors (NMDARs) were found to trigger the induction of LTP and to mediate forms of learning and memory in the mammalian brain (Bliss & Collingridge, 1993).

The biophysical properties of NMDARs can account for the Hebbian nature of LTP. Presynaptic activity is required to deliver the neurotransmitter L-glutamate and postsynaptic activity transiently alleviates the Mg2+ block of NMDARs. NMDAR properties also account for the hallmark features of input specificity, co-operativity and associativity.

Theta burst stimulation (TBS) effectively activates Hebb synapses, due to a GABA-B mediated auto-inhibition of GABAergic transmission that promotes the synaptic activation of NMDARs. If TBS is delivered in compressed episodes (intervals of seconds) the LTP is classically Hebbian. When the episodes are spaced in time (minutes), calcium-permeable AMPA receptors are also recruited to engage a PKA- and protein synthesis-dependent form of LTP, in which inputspecificity breaks down. Recently, we found that calcium-permeable AMPARs are necessary for a form of metaplasticity known as synaptic tag and capture (STC) (Park et al., 2019). Thus,Hebbian synapses engage various molecular processes that subserve different synaptic functions. Hebb, 1949. The Organization of Behavior. New York: Wiley & Sons. Bliss & Collingridge, 1993. A synaptic model of memory: long-term potentiation in the hippocampus. Nature, 361, 31-39. Park, Kang, Sanderson, Bortolotto, Georgiou, Zhuo, Kaang & Collingridge, 2019. On the role of calcium-permeable AMPARs in long-term potentiation and synaptic tagging in the rodent hippocampus. Frontiers in Synaptic Neuroscience (in press).

FRIDAY, MAY 24

8:30am – 10:15am

Grand East

Plenary symposium 2

Underlying principles of animal behaviors

Sponsored by **Lunenfeld-Tanenbaum Research Institute**

Chair: **Mei Zhen** | University of Toronto
Presenters:

Unravelling gene-environment interplay on behaviour

Marla Sokolowski | University of Toronto

We are interested in how DNA variation predisposes organisms to be more or less affected by their experiences (gene-environment interactions), how our experience gets embedded in our biology (epigenetics) and finally how DNA variation interacts with epigenetic processes to affect behavior. Experiential affects, like developmental ones can occur on different time scales. For example, nutritional or social adversity (or enrichment) can occur throughout an organism's life, in early life alone with enduring effects on later life stages, or acutely over a matter of minutes or hours. To address these issues, we take a genetic perspective using mostly Drosophila melanogaster but also humans and consider both candidate single genes and candidate pathways. This approach provides interesting opportunities and challenges because many genes and pathways that modulate behavior have multiple functions (pleiotropy) and do themselves exhibit plastic responses to experience.

Support: Natural Sciences and Engineering Council of Canada, Canadian Institutes for Health Research, Canadian Institute for Advanced Research.

Dissecting neural circuits underlying delayed motor learning in the 16p11.2 deletion mouse model of autism

Simon Chen | University of Ottawa

The Autism Spectrum Disorders (ASDs) is a cluster of neurodevelopmental disorders that are often characterized by communication deficits, social interaction impairment, and stereotypic behaviors. Despite the common prevalence of this disorder, many studies also report ASD patients exhibit motor deficits and clumsiness. However, the neuronal pathophysiology underlying these motor symptoms remains elusive. The 16p11.2 chromosomal copy number deletion accounts for approximately 1% of ASD cases in humans. A homologous chromosome region, 7qF3, was identified in mice, and deletion of this chromosomal region has shown behavioral resemblance to the human disorder. We developed a novel motor task to train 16p11.2+/- mice on a head-fixed running apparatus. Interestingly, we did not find any motor coordination deficits in the 16p11.2+/- mice but they exhibited delayed learning compared to wild-type mice. To examine whether there are structural and functional abnormalities in the layer 2/3 (L2/3) neurons in 16p11.2+/-mice, we utilized in vivo two-photon imaging to chronically monitor dendritic spines and neuronal ensemble activity of L2/3 neurons in the primary motor cortex during learning. Our preliminary data suggests that 16p11.2+/- mice show a similar rate of learning-induced spine formation but these spines undergo a delayed pruning process. At the network level, we observe distinct, highly synchronous subpopulations of L2/3 excitatory neurons in the 16p11.2+/- mice that are highly selective to firing during specific behavioral states. Lastly, we observed a loss of noradrenaline (NA) innervations exclusively in the L2/3 of the primary motor cortex in the 16p11.2+/- mice. Pharmacogenetically stimulating NA neurons in the locus coeruleus, using the DREADDs system, during motor learning in the DBH-CreERT2::16p11.2+/- mice rescued the delay in spine elimination and improved the speed of motor learning. These findings demonstrate, for the first time, a layer- and region-specific loss of NA innervations that are accompanied with deficits in synaptic reorganization, ensemble activity patterns, and delayed motor learning in a mouse model of autism.

Plasticity of acoustic preferences in female songbirds

Sarah Woolley | McGill University

Vocal communication signals are critical in social interactions across many species. Receivers can extract substantial information from vocal signals to use in mate choice and other social decisions. There is growing consensus that receivers, and their auditory systems, are not passive filters, but rather they dynamically encode acoustic stimuli. Consequently, a signal's salience may not be an inherent component of the signal, but instead determined by the individual receiver's experience and internal state. My lab investigates how experience, in particular auditory and social experience, shape auditory perception and preference. We study this in the zebra finch, a small, gregarious songbird species in which males produce learned vocal signals ('songs') during courtship interactions with females. Female zebra finches do not sing but use songs to recognize individuals and select mates. The ability of females to extract and use information from song is a critical feature of songbird communication. We manipulate auditory and social experiences throughout the lifespan and test to see how changes in experience affect song preference. In addition, we study the degree to which dopamine and other neuromodulators contribute to the learning and plasticity of song preferences. Together, these approaches help us to elucidate the mechanisms important for translating auditory and social experiences into changes in brain and behavior

10:45 – 11:45 am

Grand East

Featured plenary speaker

Neural correlates of perceptual decision-making in larval zebrafish

Florian Engert | Harvard University

Making correct perceptual decisions under noisy conditions requires reliable accumulation of sensory evidence. Even though the processes underlying such behavior are well explained by simple drift-diffusion models, their neuronal implementation remains elusive. Here we approach this problem by adapting a classical assay based on random dot motion kinematograms, usually used in primate studies, to larval zebrafish. Characterizing accuracy and delay of individual swimming decisions, we find that larvae integrate and remember motion evidence over several seconds and that the behavior is best explained by bounded driftdiffusion with leak. Using whole brain two-photon functional imaging, at cellular resolution, we identify several anterior hindbrain clusters presumably involved in the underlying computations. Relating activity in these structures to behavioral choices in individual trials, allows us to propose a biophysically plausible circuit model whose core elements are composed of two separate clusters that represent accumulated sensory evidence and decision threshold respectively, and that compete in a push-pull configuration for activating a downstream motor command.

6:00 – 7:00 pm

Grand East

Presidential lecture

Sponsored by **Hotchkiss Brain Institute**

Neural mechanisms of social reward

Robert Malenka | Stanford University

Positive prosocial interactions contribute to the development and maintenance of a range of adaptive, cooperative behaviors. Conversely, inability to participate in normal social interactions is a debilitating symptom of several prominent neuropsychiatric disorders. Although the role of neuromodulators in social behaviors, in particular oxytocin, is an active area of investigation, relatively little is known about the detailed neural mechanisms that influence sociability. This talk will review evidence that modulation of classic mesolimbic reward circuitry by oxytocin, dopamine, and serotonin all play a role in the reinforcing components of conspecific social behavior. Evidence will be presented that oxytocin acts in both the nucleus accumbens and ventral tegmental area to promote social reward. In the nucleus accumbens, oxytocin appears to act by stimulating the release of serotonin. Consistent with this hypothesis, direct release of serotonin in the nucleus accumbens via optogenetics enhances prosocial behavior while optogenetic inhibition of serotonin release decreases social interactions. Oxytocin action in the ventral tegmental area is also required for social reward. Genetic deletion of oxytocin receptors in the ventral tegmental area impairs social reward while stimulating its release using optogenetics promotes prosocial behavior in a context specific manner. Electrophysiological recordings in acute slices reveal that oxytocin promotes the firing of dopamine neurons that project to the nucleus accumbens. These findings demonstrate that the key nodes of classic mesolimbic reward circuitry, the nucleus accumbens and ventral tegmental area, are subject to multiple types of modulation by oxytocin and other neuromodulators, each of which is important for promoting prosocial behavior.

SATURDAY, MAY 25

8:30 – 10:15 am
Grand East

Plenary symposium 3
Stem cells and Organoids: developmental mechanisms, aging and disease modeling

Sponsored by **International Society for Developmental Neuroscience (ISDN)**

Chair: **Armen Saghatelyan** | Université Laval

Presenters:

Division of stem cells in freely behaving mice: dynamic and regulatory mechanisms

Armen Saghatelyan | Université Laval

Neural stem cells (NSC) persist in the subventricular zone of adult brain and transit from the quiescent to the proliferative states to produce new neurons. It remains unclear whether NSC division is correlated with particular behavioral state of animals and what are mechanisms that regulate the transition from quiescent to proliferative state. To address these questions, we aim to monitor and study the division of NSC in freely behaving mice using miniature microendoscopes. To label NSC, we electroporated CAG-GFP plasmid postnatally and analyzed GFP-retaining cells in the adult brain. Immunohistochemical characterisation of label-retaining cells in the adult brain revealed that GFP-retaining cells are either non-diving astrocytes or NSC, and that about 7% of NSCs are in the proliferative state. Since adult NSCs are defined by coincident activity of the GFAP and prominin (P2) promoters, we also co-electroporated GFAP-GFP and P2-tdtomato plasmids and analyzed the percentage of proliferative cells and NSC division (GFP+/tdtomato+). Continuous imaging of NSC in freely behaving animal during 3-4 days revealed that a long quiescent phase is followed by a rapid cell division phase.

Growth factor regulation of neural stem cells in normal and pathological conditions

David Kaplan | SickKids Hospital

Neural stem cells play key roles generating neurons and oligodendrocytes for postnatal brain development, maintenance and function. Here we have examined how cancer and aging affect the two postnatal/adult stem cells niches, the ventricular-subventricular (V-SVZ) and subgranular zone (SGZ). While there has been a dramatic improvement in the survival of pediatric brain tumor patients in recent years, most will have long-term cognitive impairments initially thought to arise as a consequence of radiation treatment. However, cognitive impairments are observed in patients with minimal treatment, suggesting that tumors themselves perturb how stem cells build the developing brain. Here we show that pediatric brain tumors and the ligands they produce compromise V-SVZ neural stem cell proliferation and function, suggesting that the tumor secretome impairs the ability of those cells to help construct the brain circuitry required for proper cognition.

Neural stem cell-mediated neurogenesis and proliferation and hippocampal/SGZ-associated learning and memory markedly decline during aging. What might be responsible for this and can we reverse it? We show that concomitant with the age-related decline in neurogenesis in the SGZ is an increase in the proportion of neural precursors that are senescent. Senescent cells secrete an array of cytokines that we propose affect the function of the remaining non-senescent stem cells. By genetically and pharmacologically ablating the senescent precursors, we can reverse the age-related decline in neural stem cell proliferation and neurogenesis and restore aspects of hippocampal learning. Therefore, in both aging and cancer we suggest that aberrant paracrine growth factor signalling directly perturb stem cell function which can be restored when the cellular source of those factors is removed.

Modeling neural development and disorders in human neurons and brain organoids

Yun Li | SickKids Hospital

The advent of pluripotent stem cell and genome editing technologies has revolutionized our ability to study human development and diseases in defined in vitro systems. Recent advancement in 3D culture technology has further opened up new avenues in modeling human physiological and pathological development on the tissue and organ level. The Li Lab is interested in understanding how the human brain forms, what makes it different from those of other species, and how disorders like autism impact its development and function. We take the experimental approach of modeling human brain development in the dish, using 2D neural cultures and 3D brain organoids. In this presentation, I will talk about our recent work on using CRISPR/Cas9-mediated gene editing to generate human pluripotent stem cell models of normal and pathological cortical development.

Since adult NSC are enriched in genes involved in the Ca2+ signaling, we next aimed to determine whether the transition from the quiescent to the proliferative state is Ca2+ dependent. We electroporated Ca2+ indicators GCaMP6s or Twitch-2B and performed Ca2+ imaging in NSC. Our data revealed that quiescent NSC display higher frequency of Ca2+ events but lower level of intracellular Ca2+. Pharmacological and CRISPR-Cas9 gene editing specifically in NSC revealed that IP3-sensitive intracellular stores regulates Ca2+ dynamic in NSC and, consequently, NSC division.

Our data suggest that Ca2+ signaling via IP3-sensitives stores plays an important role in the transition from quiescent to proliferative states of NSC.

10:45 – 11:45 am

Grand East

Featured plenary speaker

Modeling human brain development and developmental diseases using hiPSCs

Guo-Li Ming | University of Pennsylvania

Human Induced pluripotent stem cells (hiPSCs) has the potential to generate all cell types of a human body under 2D culture conditions or form organ like structures-organoids, under 3D culture conditions. Cerebral organoid cultures from human iPSCs have been recently developed to recapitulate the cytoarchitecture of the developing brain. These hiPSC based model systems offer unique advantages in understanding molecular and cellular mechanisms governing embryonic neural development and in modeling neurodevelopmental disorders, such as brain malformation and neuropsychiatric disorders. We have improved the organoid technology and developed a protocol to produce forebrain-specific organoids derived from hiPSCs using a novel miniaturized spinning bioreactor that recapitulate the human embryonic cortical development. I will discuss our recent work using these systems to understand ZIKV induced microcephaly and mental disorders.

THURSDAY, MAY 23

Parallel symposium 1
Peripheral and central mechanisms of sensory information processing

Grand West

Sponsored by **the Djavad Mowafaghian Centre for Brain Health**

Djavad Mowafaghian
CENTRE FOR BRAIN HEALTH

PS.1a Precise subcellular coordination of excitation and inhibition supports micron-scale dendritic computations

Gautam Awatramani[1], Ben Murphy-Baum[1], Geoff deRosenroll[1], Santhosh Sethuramanujam[1], Laura Hanson[1], Varsha Jain[1]
[1]University of Victoria

Since the theoretical studies of Rall, there has been broad interest in the numerous roles for dendrites in neural processing. As the receiving units of neural information throughout the brain, dendrites are well positioned to perform complex computations on their inputs that are so critical for behavior, especially with regard to sensory systems. Identifying how inputs converge onto dendrites to form computational output is critical for our basic understanding of how neurons and circuits behave. Over the last three decades there have been a plethora of studies examining the computational role of dendrites. Using a variety of state-of-the-art technologies such as two-photon glutamate uncaging, these studies have revealed the importance of the spatiotemporal sequence of excitation in dendritic computations. However, the role of inhibition has been more elusive. It is well established that temporal coordination between excitation and inhibition improves coding efficiency among networks of neurons. However, it remains unclear how the spatial coordination of excitation and inhibition at the level of dendrites impacts neural computations. In this symposium, I will discuss how excitatory and inhibitory inputs are coordinated in dendrites of direction selective ganglion cells in the mouse retina. In this circuit, it is well established that the direction selectivity relies on the precise ratio of E/I. Therefore it provides a unique preparation in where functional Ca2+ imaging techniques can provide insights into the subcellular E/I balance. I will discuss our latest results demonstrating that excitation and inhibition are coordinated on an extraordinarily fine spatial scale, which enables multiple, independent computations to occur within single dendritic branches.

PS.1b Unique properties of salt taste coding and state-dependent behavioral output in Drosophila

Molly Stanley[1]
[1]University of British Columbia

BACKGROUND AND AIM: Each taste modality is generally encoded by a single, molecularly defined, population of sensory cells. However, salt stimulates multiple taste pathways in mammals and insects, suggesting a more complex code for salt taste. Here, we examine salt coding in the Drosophila labellum. METHODS: We created a comprehensive molecular map comprised of five discrete sensory neuron classes across the fly labellum that are labelled by distinct genetic drivers. This allowed us to examine the contribution of these different classes to salt taste and feeding. First, we performed calcium imaging to determine how each population is modulated by salt stimulation. Then, we silenced each population of taste neurons to determine their role in salt feeding behavior. In addition, we optogenetically activated each population to determine their impact on feeding behavior in salt fed and deprived conditions. RESULTS: Four classes of taste neurons are activated by salt. Two exhibit characteristics of 'low salt' cells, and two show characteristics of 'high salt' classes. Behaviorally, low salt attraction depends primarily on 'sweet' neurons, with additional input from neurons expressing the ionotropic receptor IR94e. High salt avoidance is mediated by 'bitter' neurons and a population of glutamatergic neurons expressing Ppk23. Interestingly, the impact of these glutamatergic neurons depends on prior salt consumption. CONCLUSIONS: These results support a complex model for salt coding in flies that combinatorially integrates inputs from across cell types to afford robust and flexible salt behaviours.

PS.1c Flexible feature encoding in visual cortex

Stuart Trenholm[1]
[1]McGill University

Individual neurons can encode multiple distinct features depending on context or sensory stimuli. How such multiplexing arises within the presynaptic network providing input to a single neuron remains unclear. Here, we used single-cell-initiated monosynaptically restricted retrograde transsynaptic tracing with rabies viruses expressing GCaMP6s to monitor the activity of neurons in primary visual cortex and their presynaptic networks in primary visual cortex when mice were presented with a diverse set of visual stimuli. We then group presynaptic neurons into functional modules by comparing their activity during different stimulus conditions, and find that distinct stimuli are encoded by a diverse set of presynaptic neurons. We thus show the existence of complex presynaptic network modules that dynamically process distinct sensory inputs.

PS.1d Mechanisms underlying adaptive optimized coding of natural stimuli

Maurice Chacron[1]
[1]*McGill University*

BACKGROUND AND AIM: Sensory systems must continually adapt to natural stimuli whose statistics vary in time. Here we investigated whether central neurons within the electrosensory system of weakly electric fish can adapt to stimuli with different statistics. We considered stimuli whose spectral power decays with different exponents and investigated the nature of the mechanisms underlying sensory adaptation. METHODS: Recordings from awake behaving animals were performed using standard methodology. Adaptation stimuli were presented for at least two hours while neural and behavioral responses were compared early and late during stimulus presentation. In some experiments, the forebrain was removed prior to presenting the adaptation stimulus. In other experiments, the serotonergic antagonist ketanserin was applied using standard methodology prior to presenting the adaptation stimulus. RESULTS: We found that central electrosensory neurons adapted their response properties such as to more optimally encode the adaptation stimuli over the timecourse of the stimulus presentation, which led to behavioral responses that better matched the adaptation stimulus' statistics. Moreover, we found that sensory adaptation requires descending input from the forebrain as well as serotonergic input from the raphe nuclei. This is because forebrain ablation and application of serotonergic antagonists compromised sensory adaptation. CONCLUSIONS: Our results demonstrate that sensory adaptation requires descending input and provides a novel function for the serotonergic system that are likely to be shared amongst systems and species.

Parallel symposium 2
The neural basis for social decision-making

Grand Centre

PS.2a Oxytocin in the bed nucleus of the stria terminalis facilitates social anxiety

Brian Trainor[1]
[1]*University of California Davis*

Oxytocin is a well-known modulator of social behaviors, and has been put forth as a possible therapeutic for social anxiety disorder. However, studies in humans have found that oxytocin can either increase or decrease social anxiety. How can the same neuropeptide exert such different effects on behavior? In a series of studies using the California mouse model of social defeat, we demonstrate that oxytocin produced and acting within the bed nucleus of the stria terminalis inhibits social approach and increases social vigilance. Our results suggest that sex differences in how social stressors affect the activity of oxytocin producing neurons are a major contributing factor in determining sex differences in how stress affects social behavior. Consistent with work in other species, we also show that oxytocin acting in the nucleus accumbens promotes social approach. Together, these results suggest that oxytocin works in complementary neural circuits to produce divergent effects on social behaviors.

PS.2b The role of corticotropin-releasing hormone neurons in the paraventricular nucleus of the hypothalamus in social transmission of stress

Toni-Lee Sterley[1], **Dinara Baimoukhametova**[1], **Tamás Füzesi**[1], **Agnieska Zurek**[1], **Nuria Daviu**[1], **Neilen Rasiah**[1], **David Rosenegger**[1], **Jaideep Bains**[1]
[1]*University of Calgary*

BACKGROUND AND AIM: In many species, including humans, social networks allow for rapid propagation of information. Social interactions that transmit information about a threat or stress provide adaptive benefit to others in the group. The neural architecture that controls social transmission is not well understood. In the present study we aimed to determine whether corticotropin releasing hormone (CRH) neurons in the paraventricular nucleus of the hypothalamus, the controllers of the endocrine stress response, are involved in social transmission of stress. METHODS: We housed mice in same-sex littermate pairs. We exposed one mouse to an acute stress before returning the mouse to its homecage and allowing it to socially interact with its naïve partner. We used whole-cell patch clamp electrophysiology to look at stress-induced synaptic changes at glutamate synapses onto PVN-CRH neurons, and we used optogenetic manipulations to investigate the role of PVN-CRH neurons in social transmission of stress. RESULTS: Following social interaction of a partner with a stressed individual, glutamate synapses onto PVN-CRH neurons in the naïve partner show the same metaplastic changes as synapses in an individual subjected to authentic stress. PVN-CRH neurons are essential for the social transmission of stress. PVN-CRH neurons are sufficient in stressed individuals to transmit a chemical alarm signal to naive (unstressed) partners. CRH neurons in the naive partner are necessary to initiate social approach. CONCLUSIONS: These findings indicate that stress-induced synaptic changes can transmit from a stressed individual to a naïve partner, and furthermore, that PVN-CRH neurons are essential for the social transmission of stress. PVN-CRH neurons are upstream of release of chemical stress signals and are also required for initiating social behaviours that transmit stress to others.

PS.2c Insular cortex projections to nucleus accumbens core mediate social approach

Morgan Rogers-Carter[1], Anthony Djerdjaj[1], Katherine Gribbons[1], Juan Varela[1], John Christianson[1]
[1]Boston College

BACKGROUND AND AIM: Social interactions are shaped by features of the interactants, including their age, emotion, sex and familiarity. In the social affective preference (SAP) test, age-specific responses to social affect are evident when an adult male rat is presented with a pair of unfamiliar male conspecifics, one of which is stressed via 2 footshocks and the other naive to treatment. Adult test rats prefer to interact with stressed juvenile (PN30) conspecifics, but avoid stressed adult (PN50) conspecifics. This pattern depends upon the insular cortex (IC; Rogers-Carter and Varela et al., 2018), which is anatomically connected to the nucleus accumbens core (NAc). The goal of this work was to test the necessity of IC projections to NAc during social affective behavior. METHODS: To test the necessity of NAc in SAP behavior, rats were bilaterally implanted with guide cannula in NAc, and underwent SAP testing after microinjections of TTX (tetrodotoxin 1μM; 0.5ul/side) or a vehicle solution. After, to test both the necessity and sufficiency of IC projections to NAc, either an excitatory (hM3Dq) or inhibitory (hM4di) chemogenetic virus was virally delivered to IC, and guide cannula bilaterally implanted in NAc, so that administration of clozapine-n-oxide could be targeted to the terminals of NAc-projecting IC neurons before SAP testing. Lastly, we combined retrograde tracing with c-Fos immunohistochemistry to test if exposure to stressed conspecifics elicited great activation of the IC -> Nac pathway, compared to naive conspecifics. RESULTS: Bilateral pharmacological inhibition of NAc abolished the preference for stressed PN30, but not naive PN50, conspecifics. Using a combination of retrograde tracing and c-Fos immunohistochemistry, we report that social interactions with stressed PN30 conspecifics elicited greater Fos immunoreactivity in IC neurons that project to NAc, than interactions with naive PN30 conspecifics. Chemogenetic stimulation of IC terminals in the NAc increased social exploration with juvenile but not adult conspecifics, while chemogenetic inhibition of this tract blocked the adult rats' preference to investigate stressed PN30 conspecifics. This expands upon our previous finding that optogenetic inhibition of IC projection neurons mediated both approach and avoidance. CONCLUSION: These findings suggest that outputs of IC to NAc modulate social approach directed toward juvenile, but not adult conspecifics, which provides new insight to the neural circuitry underlying social decision-making.

PS.2d Neuronal signature of monogamous reunion in prairie voles

Jennifer Scribner[1], Ryan Cameron[2], Elliott Saslow[2], David Protter[2], Zoe Donaldson[2]
[1]Columbia University, [2]University of Colorado Boulder

BACKGROUND AND AIM: Prairie voles, unlike laboratory mice and rats, form life-long pair bonds with their mating partner. One hallmark of pair bonds is a desire to preferentially interact with a mating partner rather than a novel opposite sex individual, which can be measured using a partner preference test. Partner preference formation in this prairie voles depends critically on neuromodulatory signaling within the nucleus accumbens, but the cellular underpinnings of this behavior remain unclear. METHODS: To test the hypothesis that neurons within the nucleus accumbens exhibit patterns of activity reflective of selective social preference, we undertook in vivo calcium imaging in freely moving voles performing a 20-minute partner preference test at three time points: 1) in naïve animals who had not mated, 2) at short-term (3 day), and 3) long-term (17 days) time points following mating and cohabitation. We first asked whether overall neuronal activity levels differed when test animals were in the proximity of their partner or a novel stimulus animal. Then, given the role of the nucleus accumbens in other forms of motivated behavior, we performed an event-based analysis to identify neurons whose transients corresponded with social approach or departure. RESULTS: We found that current calcium imaging methodologies can be successfully employed in prairie voles. After mating, voles display robust partner preference during 20-minute imaging sessions. Similar to previous reports in mice, we found that activity (transients/cell/second) was greater during initial social interaction bouts and at the beginning of a bout. However, when controlling for differences in bout number and bout length, type of interacting vole (partner or novel) was not associated with differences in population neuronal activity. Instead, we found that distinct subsets of neurons exhibited transients that preceded approach of either a partner or novel vole. The number of partner-approach neurons increased following bond formation. CONCLUSIONS: Calcium imaging provides a powerful approach that is amenable for use in non-traditional animal models. Using this technique, we identified a subset of partner-approach neurons and found that the number of these neurons increased following pair bond formation. These neurons may represent a neuronal substrate for pair-bond directed motivation.

Parallel symposium 3
Neural stem cells in neural development and repair

Grand East

Sponsored by **International Society for Developmental Neuroscience (ISDN)**

PS.3a Elucidating the molecular control of neural stem cell maintenance in the embryonic neocortex

Sisu Han[1], Imrul Faisal[1], Grey Wilkinson[2], Satoshi Okawa[3], Lata Adnani[1], Matthew Brooks[4], Vladimir Espinosa Angarica[3], Dawn Zinyk[1], Saiqun Li[2], Rajiv Dixit[1], Yaroslav Ilnytskyy[5], Eko Raharjo[2], Jung-Woong Kim[4], Wei Wu[2], Faizan Malik[2], Waleed Rahmani[2], Diogo Castro[6], Deborah Kurrasch[1], Jennifer Chan[2], Igor Kovalchuk[5], Anand Swaroop[4], Antonio del Sol[3], Jeff Biernaskie[2], Carol Schuurmans[1]

[1]Sunnybrook Research Institute, [2]University of Calgary, [3]Luxembourg Centre for Systems Biomedicine, [4]National Eye Institute, NIH, [5]University of Lethbridge, [6]Instituto Gulbenkian de Ciência

The origins of adult neural stem cells (NSCs) has been elusive until recently, when it was shown that slow-dividing embryonic NSCs are set aside to populate the adult NSC niche. To prospectively identify embryonic NSCs marked for retention, we stratified the neocortical NSC pool into four populations based on proneural gene expression (negative, Neurog2+, Ascl1+, double+). Neurog2/Ascl1 double+ NSCs cycle the slowest, accumulating in S-phase due to the elevated expression of negative cell cycle regulators. Based on open chromatin and gene expression analyses, double+ NSCs have unique sites of open chromatin enriched in Lhx2 binding sites, and lie at the top of a lineage hierarchy, with a complex transcriptional regulatory network that is permissive for Neurog2 or Ascl1 lineage conversion. Double+ NSCs are also uncommitted, and are maintained in this state into the postnatal period by Neurog2-Ascl1 cross-repression. Finally, progenitors are prematurely depleted in Neurog2-/-;Ascl1-/- cortices, indicating that Neurog2 and Ascl1 are required together for NSC maintenance. We have thus identified a novel mechanism for embryonic NSC retention involving proneural gene cross-repression and multilineage priming.

PS.3b Clarifying the identity of adult neural stem cells

Jeff Biernaskie[1], Prajay Shah[1], Jo Stratton[1], Morgan Stykel[1], Sepideh Abbasi[1], Sandeep Sharma[1], Kyle Mayr[1], Kathrin Koblinger[1], Patrick Whelan[1]

[1]University of Calgary

Background: Ependymal cells are multi-ciliated cells that form the brain's ventricular epithelium and a niche for neural stem cells (NSCs) in the ventricular-subventricular zone (V-SVZ). In addition, ependymal cells have been suggested to be latent NSCs with a capacity to acquire neurogenic function. This remains controversial due to a lack of prospective in vivo labeling techniques that can be used to effectively distinguish ependymal cells from neighboring V-SVZ NSCs. Understanding the identity of postnatal NSCs and how they are regulated within their niche will be critical in developing strategies that enable effective brain repair. Here we employed a novel transgenic system to characterize the functional potential of ependymal cells within the postnatal brain. Methods: We performed single-cell RNA-sequencing and long term in vivo fate mapping using aSMACreERT2:RosatdTomato mice, to uniquely identify postnatal ependymal cells but excludes neural lineages in order to understand their endogenous function. Results: Ependymal cells can be identified based on their unique enrichment of cilia-related genes. Interestingly, ependymal cells share several stem-cell associated genes with neural stem and progenitors cells but indeed acquire a distinct transcriptional signature. Using long term in vivo fate mapping during homeostasis or following growth factor- or injury-induced stimulation, we found that ependymal cells failed to demonstrate any suggestion of latent stem cell function. Conclusions: These findings suggest remarkable stability of ependymal cell function and provide fundamental insights into the molecular signatures comprising the V-SVZ niche and the NSC lineage.

PS.3c Role of interneuron-secreted signals in neural stem cell-mediated oligodendrocyte genesis in the developing and adult brain

Anastassia Voronova[1]

[1]University of Alberta

BACKGROUND: During development, newborn interneurons migrate from medial ganglionic eminence (MGE) into embryonic cortex. They predominantly generate somatostatin- and pravalbumin-positive interneurons. They also associate with cortical neural precursors (NPCs) throughout late embryonic and early postnatal life, when NPCs generate astrocytes and oligodendrocytes in the postnatal cortex and white matter tracts. Parvalbumin-positive interneurons also form connections with oligodendrocyte precursor cells (OPCs) in the postnatal and adult brain. Here, we have tested the hypothesis that interneurons directly regulate NPC and/or OPC biology. METHODS: We genetically ablated the progeny of embryonic MGE interneurons by crossing Nkx2.1Cre and DTAstop mice. Interneuron-conditioned medium and transcriptomics were used to predict paracrine ligands regulating NPC function. CX3CR1 receptor knockdown in NPCs was used to assess the role of fractalkine signalling in developmental oligodendrogenesis. Infusion of CX3CL1 (fractalkine) was used to assess the role of fractalkine signalling in adult oligodendrocyte genesis. RESULTS: We show that MGE interneurons secrete factors that promote genesis of oligodendrocytes from glially-biased embryonic cortical NPCs in culture. Moreover, when MGE interneurons were genetically ablated

in vivo prior to their migration, this caused a deficit in cortical oligodendrogenesis. Modelling of the interneuron-precursor paracrine interaction using transcriptome data identified the cytokine fractalkine as responsible for the pro-oligodendrocyte effect in culture. We show that fractalkine is expressed in interneurons and that fractalkine receptor CX3CR1 is expressed in precursor cells in the developing and adult brain. Knockdown of CX3CR1 in embryonic cortical NPCs caused decreased numbers of OPCs and oligodendrocytes in the postnatal cortex. Our initial data suggests that fractalkine infusion into normal or demyelinated adult brain leads to increase in the formation of oligodendrocyte lineage cells from precursor cells. CONCLUSIONS: In addition to their role in regulating neuronal excitability, interneurons act in a paracrine fashion, at least in part through fractalkine signalling, to promote the genesis of oligodendrocytes.

PS.3d Novel mechanisms of neural stem cell regulation in spinal cord injury

Soheila Karimi[1]

[1]*University of Manitoba*

Multipotent adult neural precursor cells (NPCs) have tremendous intrinsic potential to repair the damaged spinal cord. However, evidence shows that the reparative capacity of both endogenous and transplanted NPCs is restricted within the dysregulated microenvironment of spinal cord injury (SCI). Dramatic upregulation of matrix chondroitin sulfate proteoglycans (CSPGs) is a long-lasting hallmark of SCI that limits repair process in the injured spinal cord. Using genetic and pharmacological approaches, we have uncovered that CSPGs inhibit NPCs by activating two protein tyrosine phosphatase receptors, PTPσ and LAR; and modulation of key NPC regulatory pathways. In a clinically relevant model of rat contusive SCI, we have successfully utilized two specific intracellular blocking peptides, ISP and ILP, to target PTPσ and LAR, respectively. Our work shows that CSPGs restricts survival, migration, proliferation and oligodendrogenesis of NPCs directly by signaling through LAR and PTP. Importantly, we provide novel evidence that activation of PTPσ and LAR by CSPGs induces caspase 3 mediated apoptosis in NPCs and oligodendrocyte. Moreover, presence of CSPGs promotes a pro-inflammatory response in microglia that is detrimental to NPCs differentiation and proliferation. Inhibition of LAR and PTP was sufficient to foster a pro-regenerative response in microglia characterized by increased expression of interleukin-10 that drives NPCs towards an oligodendrocyte lineage. Intracellularly, we found that Rho/ROCK appeared to be the key downstream pathway in CSPGs signaling because ROCK inhibitor reversed all the CSPGs inhibitory effects on NPCs comparable to the co-inhibition of PTPσ and LAR. Activation of PTPσ and LAR also inhibited phosphorylation of downstream Akt and Erk1/2; key pathways in NPCs differentiation. Altogether, our findings have identified a novel inhibitory role for PTPσ and LAR receptors in modulating NPCs within the CSPG regulatory axis. Thus, this work introduces a new potential therapeutic strategy for optimizing NPC therapies in SCI. Supported by the Canadian Institute of Health Research and the Craig H. Neilsen Foundation.

Parallel symposium 4
Circuit and synaptic approaches to study stress | depression and antidepressants

Osgoode East

Sponsored by **CERVO Brain Research Centre**

PS.4a Intrinsic plasticity as a neural correlates for stress habituation

Wataru Inoue[1]

[1]*University of Western Ontario*

Background: Activation of the hypothalamic-pituitary-adrenal (HPA) axis is a hallmark of the stress response conserved across vertebrates. Although adaptive in the short-term, protracted recruitment of this energetically costly response can be maladaptive. Indeed, the HPA axis is flexible and can habituate after repeated stress exposures. Despite the biological and clinical importance of HPA axis habituation, surprisingly little is known about the neural plasticity mechanisms through which repetition of stressful experiences refines the sensitivity of the stress axis to the stressor. Here I will present our recent finding that identified a neural correlates for HPA axis habituation. Methods: Using a mouse model of repeated restraint and slice patch-clamp electrophysiology, we studied hypothalamic corticotropin-releasing hormone neurons that form the apex of the HPA axis. Results: We found that the intrinsic excitability of these neurons substantially decreased after daily repeated stress in a time course that coincided with their loss of stress responsiveness in vivo. This intrinsic excitability plasticity co-developed with an expansion of surface membrane area, resulting in an increase in input conductance with minimal changes in conductance density. Moreover, repeated stress augmented ruffling of the plasma membrane, suggesting an ultrastructural plasticity that may efficiently accommodate membrane area expansion. Conclusion: We report a novel structure-function relationship for intrinsic excitability plasticity that correlates with habituation of the neuroendocrine stress response.

PS.4b Molecular mediators of dendritic atrophy regulate stress susceptibility

Mary Kay Lobo[1]

[1]University of Maryland School of Medicine

BACKGROUND AND AIM: Nucleus accumbens-NAc) medium spiny neurons (MSNs) undergo structural adaptations after stress. However, there is little information into these adaptations, and the underlying molecular mechanisms, in the two NAc MSN subtypes. Here we investigate structural adaptations in NAc MSN subtypes after social defeat stress and assess the underlying mechanisms mediating these cellular structural changes. METHODS: We use D1-Cre and A2A-Cre mice that express Cre in the two NAc MSN subtypes combined with a Cre-inducible AAV expressing EYFP (AAV-DIO-EYFP) to label MSN subtype somas and dendrites. Mice underwent 10 days of chronic social defeat stress (CSDS), followed by a social interaction test. Sholl analysis was performed to examine dendritic arborization and dendritic branching and length were also assessed. D1-Cre and A2A-Cre mice crossed to the Cre-inducible RiboTag mouse line were used to examine ribosome associated mRNA for RhoA pathway molecules, which are involved in regulation of dendritic complexity. D1-Cre mice, receiving Cre-inducible AAVs to overexpress a wildtype (WT)-RhoA, dominant negative (DN)-RhoA, or eYFP control, underwent CSDS or a 1 day subthreshold social defeat stress (SSDS) followed by social interaction. Mice displaying susceptible behavior to CSDS received 7 days of the ROCK inhibitor, Y-27632 (5mg/kg), followed by social interaction. Finally, RhoA activity and ROCK activity were assessed in respective experimental conditions. RESULTS: We observed dendritic atrophy in NAc D1-MSNs but not D2-MSNs in CSDS susceptible mice. mRNAs of RhoA pathway molecules were significantly altered in D1-MSNs of CSDS susceptible mice and RhoA activity and ROCK activity were increased in NAc of susceptible mice. Genetic overexpression of WT-RhoA in D1-MSNs induced dendritic atrophy and a susceptible outcome to SSDS, while DN-RhoA in D1-MSNs restored dendritic complexity and caused a resilient outcome to CSDS compared to eYFP controls. Mice that were susceptible to CSDS demonstrated increased social interaction after receiving the ROCK inhibitor. CONCLUSIONS: D1-MSNs display dendritic atrophy. Enhanced levels of the RhoA pathway molecules in D1-MSNs, leading to enhanced RhoA and ROCK activity, mediate D1-MSN dendritic atrophy and corresponding CSDS susceptible behavior. Overall we demonstrate structural, molecular, and behavioral outcomes to social defeat stress through NAc D1-MSNs. These studies implicate that blockade of RhoA pathway molecules can promote resilient outcomes to stress.

PS.4c Impact of stress on parental behavior: potential insights for Post-partum mental illness

Anita Autry[1], Catherine Dulac[2], Zheng Wu[2], Johannes Kohl[2], Brenda Marin-Rodriguez[2]

[11]Albert Einstein College of Medicine, [2]Harvard University

Circuit level mechanisms coordinating the impact of stress parenting: potential insights for Post-partum mental illness Anita E. Autry, Zheng Wu, Johannes Kohl, Brenda Marin-Rodriguez, Catherine Dulac BACKGROUND AND AIM: Post-partum mental illnesses affect up to 20% of mothers as well as an estimated 5% of fathers in the United States annually. These disorders can affect parental bonding and quality of care that impact not only parents but also children. Maternal stress, a significant risk factor for post-partum mental disorders, is associated with reduced handling and nursing of young and leads to higher stress reactivity of the infants in adulthood; conversely, higher levels of maternal care reduce vulnerability of the offspring to stress later in life. These observations highlight the significance of quality of maternal care on the physical and mental well-being of offspring. In mice, virgin females display spontaneous maternal behaviors that become more intense in mothers. Virgin males show low levels of parental behavior and often attack or kill pups. However, males display enhanced parental care during a transient period after mating that is coincident with the birth of their pups. These data suggested to us that affiliative and agonistic behavior toward pups may be controlled by neural circuits of opposing functions, such that agonistic behavioral circuits dominate in virgin males and stressed females, while affiliative behavior circuits are preferentially active in mated males and unstressed females. METHODS: We identified cell populations critical for pup-directed aggression using immediate early gene expression. We tested the functional relevance of our cell population for pup-directed neglect and aggression using chemogenetic and optogenetic approaches. Using transsynaptic rabies tracing, we identified input cell populations. RESULTS: In our studies, we uncovered a population of neurons that are activated specifically during pup-directed aggression in males and females. Optogenetic activation of these neurons leads to disrupted maternal care. We find that this cell population is also active in stressed females showing deficits in maternal care. Our studies revealed that these neurons receive inputs from cell populations critical for the control of parental behavior and acute stress responses. CONCLUSIONS: In this presentation, we will discuss how this neuron population could play an essential role in transmitting the impact of stress on parenting behavior and suggest potential implications for post-partum mental illness.

PS.4d Translational control of the antidepressant effect of ketamine and its metabolite hydroxynorketamine

Argel Aguilar Valles[1], Agnieszka Skalecka[2], Edna Matta-Camacho[1], Mohammad Elsamizade[3], Danilo De Gregorio[3], Jean-Claude Lacaille[4], Gabriella Gobbi[3], Nahum Sonenberg[2]

[1]Carleton University, [2]McGillUniversity, [3]McGill University, [4]Universite de Montreal

BACKGROUND AND AIM: The fast-acting antidepressant drug ketamine and its metabolite (2R, 6R)-hydroxynorketamine (HNK) activate the mammalian target of rapamycin (mTOR) signaling pathway, which is required for the antidepressant effect of ketamine. mTOR regulates many cellular functions, including mRNA translation (also known as protein synthesis) through phosphorylation and inactivation of the eukaryotic initiation factor 4E (eIF4E) binding proteins (4E-BPs), leading to the activation of eIF4E and mRNA translation initiation. There are two alternative hypotheses on the cellular targets of ketamine, one suggesting that it directly targets excitatory neurons while another suggests that it indirectly activates these neurons by inactivating inhibitory interneurons. We seek to determine whether 4E-BPs were required for the antidepressant effect of ketamine and HNK, and whether this pathway is activated in excitatory or inhibitory neurons. METHODS: To determine whether the 4E-BP/eIF4E axis is required for the antidepressant effect of ketamine and HNK, Eif4ebp1 or Eif4ebp2 knockout (KO) mice were treated with ketamine (IP, 10 mg/kg) or HNK (IP, 20 mg/kg) and their antidepressant effect (1 h) was determined in the forced swim test (FST) and novelty suppressed feeding (NSF). To determine whether 4E-BPs are required in a specific cell type, we used conditional Eif4ebp1 or Eif4ebp2 KO mice in excitatory (Camk2a positive) or inhibitory (Gad2 positive) neurons treated with either ketamine, HNK or fluoxetine (IP, 3 mg/kg). RESULTS: Neither drug affected the immobility in the FST of Eif4ebp1-/- or Eif4ebp2-/- mice, but, as expected, they reduced it in wildtype mice. Intriguingly, the effect of ketamine on NSF (reduced latency to feed in a new environment) was absent only in Eif4ebp2-/- but not in Eif4ebp1-/- mice, suggesting differential involvement of these 4E-BP isoforms in these antidepressant effects. Mice lacking either Eif4ebp1 or Eif4ebp2 in Camk2a cells, were resistant to the antidepressant effects of ketamine and HNK, but responded normally to an acute injection fluoxetine. Conditional KO mice in Gad2 cells were also resistant to the effects of ketamine, HNK and fluoxetine. Furthermore, Eif4ebp2-/- mice in Gad2 cells displayed reduced immobility in the FST without any antidepressant treatment, suggesting a preponderant role for 4E-BP2 in Gad2 neurons in the response to antidepressant drugs. CONCLUSIONS: Overall, these results indicate that activation of cap-dependent translation is required in both excitatory and inhibitory neurons for the antidepressant effect of ketamine and HNK.

FRIDAY, MAY 24

Parallel symposium 5
Emotions and behavioural responses in normal and pathological states

Osgoode West

Sponsored by **Tucker-Davis Technologies**

PS.5a Role of lateral hypothalamus neural outputs in behavioural responses

Christophe Proulx[1], Ekaterina Martianova[1], Alicia Pageau[1], Danahé LeBlanc[1]

[1]Université Laval

BACKGROUND AND AIM: The lateral hypothalamus (LHA) sends neural outputs to brain regions known to control reward and motivated behaviors. However, how these distinct LHA outputs process information to control behavior is poorly known. Here, we use in vivo fiber photometry calcium (Ca2+) imaging and optogenetics to characterize LHA outputs in freely moving mice. METHODS: An adeno-associated virus (AAV) encoding the calcium indicator GCaMP6s (AAV-GCaMP6s) was first injected in the LHA. Three weeks later, GCaMP6s was expressed in cell bodies and axons terminals of LHA neurons, and optic fiber cannulas were chronically implanted with the tip placed immediately above the lateral habenula (LHb), the ventral tegmental area (VTA), and the dorsal raphe nucleus (DRN), three majors downstream LHA targets. Ca2+-dependent fluorescence measured at LHA axons terminals is a good proxy of neural activity, allowing us to record neural activity simultaneously and specifically at LHA-LHb, LHA-VTA, and LHA-DRN pathways, in mice subjected to different stimuli or placed in different contexts. Channelrhodopsine 2 (ChR2) replace GCaMP6s for optogenetic manipulations. RESULTS: When mice were presented with aversive air puff, increased Ca2+ signals were detected in all three LHA outputs. Conversely, consumption of rewarding sucrose water decreased Ca2+ signals. When Ca2+ signals were measured in mice free to explore an open field or during tail-suspension test (TST), a test commonly used to measure motivation and despair in mice, we found a significant correlation between Ca2+ signals and mobility scores in both tests. Interestingly, this correlation was significantly higher during TST ($R2 = 0.14 \pm 0.03$ in open field test vs $R2 = 0.36 \pm 0.05$ in the TST; $p < 0.002$, unpaired Mann-Whitney) suggesting that LHA may guide motivated responses in more stressful contexts. To test this assertion, Ca2+ signals were monitor at LHA outputs in mice subjected to cued-fear conditioning. We found that Ca2+ signal and mobility score more strongly correlated after administration of paired tone-shocks during conditioning. Optogenetic stimulation of all three LHA outputs was aversive when tested in the real-time place preference test, and increased mobility in the TST. However, only stimulation of LHA-LHb and LHA-DRN reduced sucrose consumption. CONCLUSIONS: Combined, our results suggest that the LHA may be a central hub to provide emotion-related signals to the LHb, VTA, and DRN to motivate proper responses when an animal is high state of vigilance.

PS.5b Neural circuit control of sex-differences in valence-based decision making

Erin Calipari[1]
[1]*Vanderbilt University*

BACKGROUND AND AIM: Learned associations between environmental cues and experience are the basis of decision-making and allow organisms to guide behavior towards advantageous outcomes. Animals achieve this by assigning value to cues that predict positive and negative stimuli, termed valence. Dysfunction in the neuronal processes that regulate these associations, especially in the nucleus accumbens (NAc), is a critical factor in the pathology of a number of psychiatric disease states; thus, understanding the neural processes that control this type of learning has widespread value for understanding psychiatric disease. The NAc is a heterogeneous region primarily composed of two opposing cell types: D1 and D2 medium spiny projection neurons (MSNs). Currently, the standing hypothesis in the field is that the activation of D1 MSNs promotes reward while D2 MSNs promote aversion; however, our data show definitively that this cannot be the case. Thus, currently, it is unclear as to whether these neuronal populations encode value or specific motivated actions, and how their temporally specific guides the execution of behavior. By combining optical tools with novel behavioral tasks, we have defined the precise role of these neuronal populations in goal-directed behavior. METHODS: We have developed a novel behavioral task that allows for the dissociation of value from behavioral responses and have used this to investigate the temporal activation patterns of accumbal D1 and D2 MSNs that encode information. By combining this task with designer receptors exclusively activated by designer drugs (DREADDs), optogenetic intracranial self-stimulation (ICSS), and fiber photometry calcium imaging (GCaMP) in D1-Cre mice, we are able to define the precise information that is encoded in the temporally-specific activity signatures of these neuronal populations. RESULTS: We first show that the selective activation of D1 MSNs in the NAc is reinforcing. However, in contrast to the previous work suggesting that D2 MSNs promote aversion, optical activation of D2 MSNs was also reinforcing. Using inhibitory DREADDs, we show that D1 inhibition is capable of both reducing positive reinforcement and enhancing negative reinforcement learning. Fiber photometry calcium revealed that D1 MSNs are activated in response to auditory cues signaling sucrose reward as well as in response to aversive stimuli, such as foot shock, as well as the cues that predict their occurrence. CONCLUSIONS: These findings support the role of D1 MSNs in reward processing, but further implicate these neurons as critically involved in aversive learning as D1 MSNs are activated by aversive stimuli and cues that predict their occurrence. This suggests that D1 MSNs not only process rewarding stimuli but also encode and predict current and future salient events. As such, the role of D1 and D2 MSNs in learning are more complex and broadly implicated than previously thought.

PS.5c Anatomical, molecular and functional heterogeneity of the lateral habenula defines a distinctive depression subtype

Stephan Lammel[1]
[1]*UC Berkeley*

BACKGROUND AND AIM: A major challenge of depression research is the heterogeneity of symptoms and lack of biomarkers to distinguish depression subtypes. We developed an unbiased depression rating system that allows us to identify symptomatic depression phenotypes in mice. Using this approach, we deconstructed the circuit architecture, molecular profile and synaptic characteristics of the lateral habenula (LHb), a brain region that has recently emerged as a potential key structure in depression. METHODS: We designed a multi-level approach integrating animal behavior, anatomical analysis, electrophysiology and RNA sequencing to examine a specific depression subtype from circuit to physiology to gene-expression profile. RESULTS: First, we observed that mice, like humans, display a variety of discrete behavioral phenotypes in response to chronic stress. Second, we found that ventral tegmental area (VTA)-projecting LHb neurons, but not dorsal raphe (DR)-projecting LHb neurons, display depression-related hyperactivity, which involves both increased burst and tonic firing and selectively manifests in behavioral despair but not anxiety or anhedonia. Third, we addressed the synaptic mechanisms that may drive hyperactivity of VTA-projecting LHb neurons in mice with behavioral despair and identified its presynaptic origin in the entopeduncular nucleus (EP). Along the way, we show that in vivo manipulations of LHb-projecting EP neurons and VTA-projecting LHb neurons alter behavioral despair, but not anxiety or anhedonia. Furthermore, we suggest one possible circuit mechanism that may explain the lack of depression-related hyperactivity in DR-projecting LHb neurons. Fourth, using single-cell transcriptomics we reveal a set of genes that collectively can serve as biomarkers to identify mice with behavioral despair and differentiate VTA- from DR-projecting LHb neurons. CONCLUSIONS: The identification of biological markers that align with behavioral phenotypes constitutes the basis for reducing the complexity of depression and the development of more specific treatments of this broad, heterogeneous disease.

PS.5d Ventral pallidal neurons in reward seeking and punishment avoidance

Bo Li[1]
[1]*Cold Spring Harbor Laboratory*

Motivated behaviors can be driven by two opposing processes, the desire to obtain a reward or the drive to avoid a punishment. The ventral pallidum (VP) is critical for attributing motivational salience to cues that predict reward and for invigorating reward seeking behaviour. Sparse evidence suggests that the VP may also play a role in motivating avoidance behavior. To identify the circuits, cell types and coding principles of VP neurons that may underlie behaviors driven by positive as well as negative motivations, we used optogenetic manipulations combined with in vivo single unit recording to probe the functions of distinct classes of VP neurons in mice performing tasks reinforced by reward and punishment. We found that GABAergic and Glutamatergic VP neurons are critical for reward seeking and punishment avoidance, respectively, likely through their projections to the lateral habenula. Furthermore, GABAergic VP neurons signal positive motivational state and the incentive value that invigorates

reward seeking, and Glutamatergic VP neurons signal negative motivational state and the aversive incentive that may drive punishment avoidance. Our results suggest that Glutamatergic and GABAergic activities in the VP sets the motivation for approach versus avoidance.

Parallel symposium 6
Novel approaches to understanding genetic underpinnings of Autism Spectrum Disorder

Grand Centre

Sponsored by **International Society for Developmental Neuroscience (ISDN)**

PS.6a Regulation of KCC2 as a target for treatment of Autism

Vineeth Andisseryparambil Raveendran[1], Jessica Pressey[1], Vivek Mahadevan[2], Yves De Koninck[3], Melanie Woodin[1]
[1]University of Toronto, [2]National Institutes of Health, [3]University of Laval

Synaptic inhibition in the central nervous system is primarily mediated by the neurotransmitter GABA which acts by opening chloride (Cl-) permeable channels such as the GABAA receptor. The efficacy of inhibition is dependent on the driving force for Cl- across the membrane. Low intracellular Cl- concentration is predominantly set by the potassium chloride co-transporter 2 (KCC2). Thus, efficient neuronal inhibition is critical for maintaining normal circuit excitation-inhibition balance, and normal neuronal function. KCC2 function is regulated by protein interactions, and recently our lab has identified the first comprehensive list of KCC2 protein interactors. Specifically, the protein Pacsin1 was shown to interact with KCC2 and act as a negative regulator of KCC2 abundance and surface expression. By validating the KCC2-Pacsin1 interaction we confirmed our hypothesis that manipulating KCC2 protein interactions could be harnessed as an efficient technique to regulate KCC2 in a neuron specific manner. In recent years, many studies have identified the common thread of disrupted KCC2 function and increased neuronal Cl- concentrations in various neurological disorders, including Autism Spectrum Disorder. This observation that many neurological conditions share this same feature presents a unique opportunity to develop a therapeutic strategy which restores efficient KCC2-mediated Cl- extrusion to treat a broad spectrum of neurological conditions.

PS.6b Using integrative proteomics to identify Autism spectrum disorder signaling networks in mammalian models

Karun Singh[1]
[1]McMaster University

Recent large genomic studies on large Autism spectrum disorders (ASD) cohorts have revealed hundreds of risk genes, but how these diverse genes contribute to the pathophysiology of ASD remains unknown. To study how high-risk ASD genes and patient-specific mutations impact neuronal signaling, we are using proteomics on human iPS and mouse models to identify disease-associated signaling networks in an unbiased manner. In this presentation, we will present how combining techniques such as proximity-based labeling with phospho-proteomics reveals previously unknown signaling pathways with cellular spatial resolution. This approach also highlights how specific neuronal organelles and compartments are impacted by multiple ASD proteins, and how patient-specific mutations produce gain-of-function effects. This combined approach provides unique insight into how dysfunctional signaling mechanisms may lead to ASD pathophysiology, and targeting of these networks may be new opportunities for therapeutic development.

PS.6c Systematic phenomics analysis of ASD-associated genes defines novel shared and unique functions and identifies parallel genetic networks underlying hypersensitivity and impaired habituation

Catharine Rankin[1], Troy McDiarmid[1], Manuel Belmadani[1], Joseph Liang[1], Fabian Meili[1], Kota Mizumoto[1], Kurt Haas[1], Paul Pavlidis[1]
[1]University of British Columbia

BACKGROUND AND AIM: A primary challenge facing Autism Spectrum Disorder (ASD) genetics is the large and growing number of genes and gene variants of unknown functional significance. Here, we used Caenorhabditis elegans to systematically functionally characterize ASD-associated genes in vivo. METHODS: Using our custom machine vision system we characterized 26 quantitative phenotypes spanning morphology, baseline locomotion, tactile sensitivity, and habituation learning in 87 strains of C. elegans each carrying a mutation in an ortholog of an ASD-associated gene. RESULTS: This research has generated a large number of novel genotype to phenotype relationships that range from severe developmental delays and uncoordinated movement to subtle deficits in sensory and learning behaviours. Clustering based on multi-parametric phenomic profiles revealed several genes whose inactivation result in a strikingly similar profile characterized by hypersensitivity and impaired habituation learning. Epistasis experiments revealed that this phenomic similarity resulted from previously undiscovered functional genetic interactions, including parallel and convergent networks centered on CHD8•chd-7 and NLGN3•nlg-1. In addition to mapping genetic networks, our phenotypic profiles can be leveraged for transgenic rescue based in vivo functional assays to gauge ASD-associated missense variant effect. Transgenic pan-neuronal expression of human NLGN3 in nlg-1 mutant C. elegans rescued their hypersensitivity and habituation learning impairments; confirming functional conservation. We then tested the ability of all ASD-associated neuroligin mutations to rescue impaired habituation in nlg-1 mutant worms, revealing varied partial loss-of-function that was not due to altered subcellular localization. Finally, we used the

CRISPR-Cas9 Auxin Inducible Degradation system to reversibly degrade nlg-1 at various points throughout the lifespan to determine whether phenotypic abnormalities caused by developmental loss of the protein can be reversed by adult re-expression. CONCLUSIONS:The wealth of in vivo phenomic functional data generated in this work begins to chart the phenotypic landscape of ASD-associated genes, revealing hundreds of shared and unique functions. Ultimately this work will inform more targeted studies in vertebrates and offers novel positive and negative pathway components as therapeutic targets for ameliorating the effects of ASD.

PS.6d A multi-model system approach to functional variomics of ASD-associated missense mutations of PTEN

Kurt Haas[1], Catharine Rankin[1], Paul Pavlidis[1], Timothy O'Connor[1], Douglas Allan[1], Christopher Loewen[1], Shernaz Bamji[1]

[1]University of British Columbia

While mutations of PTEN have been strongly linked to both autism spectrum disorders (ASD) and cancer, the molecular mechanisms underlying pathophysiology remain unclear. A large number of missense mutations producing single amino acid variants of PTEN have been identified in individuals with ASD, yet their impact on PTEN function and ASD remain unknown. To address this issue, 7 labs at UBC, including Drs. Pavlidis, Allan, Loewen, O'Connor, Bamji, Rankin, and Haas, have established a multi-model system approach for deep phenotypic profiling of ASD-associated genes and their missense variants. Using models spanning phylogeny, including yeast, fly, worm, rat, and human cell lines, this platform has tested 105 variants of PTEN in diverse cellular environments to achieve high confidence validated impact of mutation on protein function.

Parallel symposium 7
Atypical roles for NMDA receptors in physiology and disease

Grand East

Sponsored by **CERVO Brain Research Centre**

PS.7a Unorthodox NMDA receptor signalling in neocortical plasticity

Therese Abrahamsson[1], Christina You Chien Chou[1], Sally Si Ying Li[1], Adamo Mancino[1], Jennifer Brock[1], William Todd Farmer[1], Keith Murai[1], Jesper Sjöström[1]

[1]McGill University

BACKGROUND AND AIM: In the classical view, NMDA receptors (NMDARs) function as coincidence detectors of pre- and postsynaptic activity in Hebbian plasticity by fluxing Ca when simultaneously glutamate bound and depolarized. This functionality requires that they be situated postsynaptically. However, evidence for enigmatic presynaptic NMDARs (preNMDARs) with unclear impact on plasticity and neurotransmitter release have been reported for a couple of decades. Furthermore, NMDARs have recently been shown to also signal metabotropically, without the need for Ca influx. We set out to elucidate published inconsistencies of preNMDARs-mediated regulation of spontaneous and evoked release, hypothesizing that they could be due to different forms of signalling. METHODS: We explored spontaneous and evoked release in neocortical layer-5 (L5) pyramidal cells (PCs) using whole-cell recordings and 2-photon laser-scanning microscopy of calcium signals in acute visual cortex slices. We used P11-P18 C57BL/6 mice or transgenics with the vesicle priming protein RIM1ab conditionally knocked out. JNK2 signalling was blocked with SP600125 (4 µM) or TCS JNK 6o (0.1 µM), and NMDARs with AP5 (200 µM), Ro 25-6981 (0.5 µM), or MK801 (2 µM). mEPSCs were recorded in voltage clamp at -80 mV in the presence of 0.1 µM TTX and 20 µM Bicuculline. RESULTS: In agreement with prior literature, spontaneous release in L5 PCs was reduced by preNMDAR blockade, as was release evoked in brief 30-Hz bursts at L5 PC-to-PC monosynaptic connections. However, release evoked below ~8Hz was unaffected by preNMDAR blockade, presumably because Mg unblock required sufficiently high frequencies. In agreement, Mg washout (from 1 to 0.2 mM) increased release evoked at 5Hz in a preNMDAR-sensitive manner. However, Mg washout had no effect on spontaneous release, suggesting differential regulation. We next explored potential signalling cascades, and found that heterozygous RIM1ab knockout abolished preNMDAR regulation of evoked, suggesting haploinsufficiency, yet had no effect on preNMDAR regulation of spontaneous release. We next investigated if JNK2 blockade abolished preNMDAR-mediated regulation of spontaneous release, as was previously shown for entorhinal cortex, and reproduced this in visual cortex L5 PCs. Evoked release, on the other hand, was unaffected by JNK2 blockade, again suggesting differential regulation. CONCLUSIONS: We reveal a double dissociation of preNMDAR signalling in L5 PCs. Spontaneous release is regulated in a Mg-independent manner via JNK2, implicating metabotropic signalling. The regulation of evoked release, on the other hand, depends on Mg and on RIM1ab, suggesting ionotropic signalling. This double dissociation explains how preNMDARs can affect evoked but not spontaneous release in a frequency-dependent manner. In summary, our findings highlight how the classical view of NMDARs needs to be expanded to include presynaptic and metabotropic signalling.

PS.7b Metabotropic NMDA receptor signaling underlies synaptic depression and dysfunction

Kim Dore[1], Marc Marino[1], Roberto Malinow[1]
[1]UCSD

BACKGROUND AND AIM: Until recently, NMDA receptor (NMDAR) functions have been attributed to its ability to conduct calcium ions. However, growing evidence demonstrates that glutamate binding alone can induce depression of AMPA receptor-mediated transmission, suggesting that the NMDAR has a metabotropic function. We studied NMDAR metabotropic signaling during synaptic depression and amyloid-beta induced depression. METHODS: Hippocampal neurons were used to monitor conformational movement in the NMDAR and its interactions with associated signaling molecules with FRET-FLIM. Electrophysiology was used to assess synaptic transmission. RESULTS: We previously measured ligand-driven conformational movement in the NMDAR cytoplasmic domain as well as reduced interaction with the associated signaling molecules PP1 and CaMKII during LTD. We now find that a) overexpression of amyloid-beta (Aβ) produces similar effects; b) overexpression of PSD-95 blocks Aβ-driven conformational movement as well as Aβ-induced depression; c) large spines, containing more endogenous PSD-95, are protected from Aβ effects; d) overexpressed PSD-95 does not potentiate AMPAR-mediated transmission in tissue lacking GluA1; e) nevertheless, overexpression of PSD-95 continues to block Aβ-induced synaptic depression in GluA1-lacking tissue. CONCLUSIONS: Our results show that the NMDAR can induce signaling without ion-flux by a conformational change in its cytoplasmic domain. This movement occurs during ligand-driven LTD and Aβ-induced depression and supports the view that a common mechanism, metabotropic actions of NMDARs, underlies these two means of diminishing AMPA-receptor mediated transmission. Moreover, we show that PSD-95 prevents the effects of amyloid-beta by interfering with NMDAR metabotropic function indicating that strong synapses may be protected from amyloid-beta.

PS.7c Non-canonical NMDA signaling in pain plasticity and reconsolidation

Abigail D'Souza[1], David He[1], Robert Bonin[1]
[1]University of Toronto

BACKGROUND AND AIM: Intractable pain causes disability among more than 20% of Canadians. Pathological pain can arise from plastic changes in nociceptive networks of the spinal dorsal horn. These changes can produce hyperexcitability of spinal nociceptive networks, ultimately leading to inappropriate processing of sensory activity and increased pain perception. We have previously shown that the reactivation of sensitized nociceptive networks triggers a process that parallels memory reconsolidation: a protein synthesis-dependent process in which memories are rendered labile and modifiable after recall. The reactivation of previously sensitized sensory pathways in the spinal dorsal horn engages a reconsolidation-like process that enables the reversal of synaptic plasticity and pathological nociceptive processing. The selective control of this depotentiation process could provide a novel and effective treatment for pathological pain. However, it is unclear how this depotentiation is initiated or what the underlying mechanisms are. NMDA receptor activation is necessary for the induction of pain reconsolidation and activity-dependent reversal of hyperalgesia. Here, we examine the role of non-canonical, non-ionotropic NMDA (NI-NMDA) receptor in the regulation of spinal synaptic plasticity and hyperalgesia, and explore whether NI-NMDA contributes to the destabilization of spinal sensitization in pain reconsolidation. METHODS: In vivo, mechanosensitivity was assessed in mice using von Frey filaments and mechanical sensitization was induced by intraplantar injection of the irritant, capsaicin. In vitro electrophysiological measurement of afferent input to dorsal horn nociceptive networks was conducted by measuring field post-synaptic potentials induced by electrical stimulation of dorsal roots in an isolated lumbar spinal cord preparation. RESULTS: In behavioural models, NI-NMDA signaling in the spinal nociceptive networks was induced by combining hind paw injection of capsaicin with intrathecal injection of NMDA receptor glycine site antagonists or pore blockers to prevent ionotropic NMDA activity. We observed that NI-NMDA was sufficient to reverse hyperalgesia. Similarly, in vitro electrophysiological studies of afferent input to the spinal dorsal horn showed that NI-NMDA signaling reversed spinal LTP but had no effect in the absence of LTP. Finally, we linked NI-NMDA signaling to pain reconsolidation by demonstrating that the reversal of hyperalgesia and LTP through reconsolidation blockade and NI-NMDA involve similar mechanisms to reverse hyperalgesia. CONCLUSIONS: These findings reveal a novel role for NI-NMDA signalling in the regulation of spinal sensitization and hyperalgesia. We further demonstrate intriguing links between NI-NMDA signalling and pain reconsolidation that indicate a role of NI-NMDA signalling in the activity-dependent destabilization of memory traces.

PS.7d A surprising neuroprotective role for amyloid beta during ischemia

Laura Palmer[1], Andrew Boyce[1], Tal Tanne[1], Alexander Lohman[1], S. R. Wayne Chen[1], Roger Thompson[1]
[1]University of Calgary

BACKGROUND AND AIM: Alzheimer's disease (AD) is associated with pathological production and deposition of the amyloid β (Aβ) protein. Approximately 5% of AD cases are genetic, indicating a strong contribution by environmental risk factors and other co-morbidities in developing the disease. Ischemic stroke has been identified as an important risk factor, and accounts for up to five-fold increase in risk of developing AD. Interestingly, hypoxia upregulates production of Aβ. The function for this is unknown, but is assumed to be a pathological consequence of ischemia. Due to the toxic role Aβ plays in AD, we hypothesized that Aβ would enhance excitotoxicity during hypoxia by modulating the anoxic depolarization (aDP). The aDP is a large inward current that occurs in response to reversed glutamate uptake and excessive glutamate release, activating N-methyl-D-aspartate receptors (NMDARs). Previously, we have described metabotropic signalling from the NMDAR to pannexin-1 (Panx1) channels via Src kinase during ischemia, which requires ligand binding, but not channel conductance of the NMDAR. Group I metabotropic glutamate receptors (mGluRs) can enhance

NMDAR activation during excitotoxicity, suggesting a potentially convergent signalling pathway to open Panx1. Since NMDARs/mGluRs are a known target of Aβ, we hypothesized that Aβ could modify Panx1 opening during ischemia. METHODS: Using whole-cell patch clamp electrophysiology and 2 photon laser scanning microscopy in rat and mouse hippocampal slices, the aDP was assayed using low oxygen (~5 mmHg) artificial cerebral spinal fluid. RESULTS: Surprisingly, we found low concentrations of Aβ to be protective and reduce Panx1 opening during the aDP. Young 5xFAD or 5xFAD/GCaMP6f mice had reduced aDP severity and calcium dysregulation compared to wild-type littermates, which was dependent on Aβ load. Low concentrations (pM to nM) of oligomeric rAβ and hAβ also attenuated the aDP, while reducing endogenous Aβ levels using a -secretase inhibitor increased aDP severity. Aβ potently blocked Panx1-sensitive secondary currents in response to NMDA overstimulation, however, Aβ failed to block Panx1 currents directly in Panx1-expressing HEK cells. mGluR1 activation by the agonist DHPG enhanced Panx1 opening, which was reversed by Aβ. mGluR1 antagonists LY 367385 and Bay 367620 also attenuated the aDP in a non-additive manner with Aβ, suggesting that Aβ functions as an mGluR1 antagonist to reduce metabotropic NMDAR signalling. CONCLUSIONS: These data reveal a novel modulation of Panx1 opening by mGluR1, which is regulated by Aβ. Aβ production could be increased during hypoxia to reduce activation of Panx1, thereby attenuating the aDP and downstream cell death pathways. With prolonged/repeated ischemic events, Aβ could reach toxic levels and coincide with hallmark pathophysiology of AD.

Parallel symposium 8
Multi-species approaches to the mammalian social brain

Osgoode East

PS.8a Life in groups: selectivity and reward in vole relationships

Annaliese Beery[1]

[1]*Smith College*

Social relationships between peers are central to the ability to live in groups. The study of social monogamy in prairie voles has contributed greatly to our understanding of the neurobiology of affiliative behavior, yet little is known about the pathways supporting non-reproductive relationships. To determine how neural circuits supporting group living are similar to and different from those supporting reproductive relationships, we study same-sex affiliative behavior in two species of group-living voles. Meadow voles (Microtus pennsylvanicus) transition from solitary in summer months to living in social groups during winter. This transition is mirrored in the lab by changes in social tolerance and partner huddling with day length. Prairie voles (Microtus ochrogaster) are socially monogamous, and also form selective preferences for same-sex peers. I will discuss effects of manipulations of oxytocin and dopamine signaling on social selectivity and social behavior with both peers and mates in voles. These studies indicate that the neuroanatomical substrates of peer social behavior differ from those implicated in sexual bond formation, while sharing some common elements.

PS.8b Social influences on development in naked mole-rats

Melissa Holmes[1]

[1]*University of Toronto*

Social experience is a key variable in the development of individual differences in social behaviour. Naked mole-rats are eusocial rodents that provide an exceptional opportunity to study how the social environment alters brain structure and function in mammals to sculpt adult social phenotypes. These animals live in large colonies with strict social and reproductive hierarchies. A single breeding female and her 1-3 male consorts are socially dominant over all other animals, who are reproductively suppressed adults called subordinates. Subordinates can be further classified as workers, soldiers, and dispersers, depending on their behaviour towards familiar and unfamiliar conspecifics. We have demonstrated that changes in the social environment can shift animals between castes/subcastes, which is accompanied by changes in brain morphology, neuroendocrine signalling, and gene expression. Specifically, a reduction in RFamide-related peptide-3 triggers activation of the hypothalamic-pituitary-gonadal axis in animals released from reproductive suppression. Furthermore, oxytocinergic signalling contributes to subcaste differences in sociality, at least in part by modulating coordinated neural activity in the social decision making brain network in a social context dependent manner. Collectively, our work capitalizes on the remarkable social adaptations of naked mole-rats to understand how the brain controls stable yet plastic individual differences in social phenotype.

PS.8c Investigating social learning in degus

Nathan Insel[1]
[1]*University of Montana*

Individuals learn from one another, and also learn about one-another. Recent research has revealed several unexpected ways in which learning and memory systems in the brain can specialized for social cognition, including specializations within the hippocampus, prefrontal cortex, and throughout sensory systems. But our ability to understand how operations in these systems support social learning is limited by our ability to observe precisely what, when, and how information from and about others is acquired. Degus are highly social caviomorph rodents from Chile that use a rich repertoire of vocalizations as well as visual systems adapted for daytime foraging. By studying degu social behavior we have begun to develop more nuanced methods for establishing causes and mechanisms of social learning. For example, like mice and rats, degus can learn to fear an environment by observing a conspecific in distress; by studying degu vocalizations we have found that this may be a function of the prosody of calls transmitted by the distressed demonstrator. Separately, while further examining empathy-related behaviors, we incidentally found evidence that degus extinguish conditioned place-avoidance after observing naïve cagemates enter the dangerous place unharmed. Most recently we have begun to examine how degus learn about one-another through natural, physical and vocal social interactions. Female degus tend to be more motivated to interact with strangers than cagemates, but the types of physical and vocal interactions they use with strangers differ from those between cagemates. In both males and females, agonistic interactions are more common between strangers, and this increases over days. These behavioral observations will be discussed alongside preliminary investigations into the supporting neural processes, including evidence for a role of oxytocin signaling in vocal interactions, as well as electrophysiological data from cortical memory systems.

PS.8d Neurobiological investigation of vocal production in the social mammalian brain

Michael Yartsev[1]
[1]*UC Berkeley*

Learning a language is generally considered the crown jewel of human abilities. Yet the core question of 'What is it about the human mammalian brain that allows us to learn our language?', remains unresolved. In humans, language acquisition is mediated by a process called 'vocal learning'. While humans are expert vocal learners, a remarkably sparse subset of mammals share this capacity and as a result, the neurobiological mechanisms of vocal learning were never studied before in the mammalian brain. To complement the remarkable research work done in the songbird and help bridge this major gap of knowledge we set out to establish the bat as a mammalian model system for studying the neurobiological mechanism of vocal learning. Here, I will present our initial efforts towards achieving this goal which included overcoming major roadblock due to the near complete absence of research efforts in this domain in mammals. These include (i) identifying the appropriate behavioral paradigms for studying the process of vocal production learning, (ii) the relevant neural circuitries which might mediate this process in the developing and adult mammalian brain and (iii) the establishments of the necessary novel technologies to support this new research direction.

SATURDAY, MAY 25

Parallel symposium 9
Heterogeneous mechanisms underlying hippocampal synaptic plasticity

Grand West
Sponsored by **CERVO Brain Research Centre**

PS.9a Lysosomal inhibition rescues hippocampal neuronal plasticity impaired by a Christianson Syndrome mutation in SLC9A6

Anne McKinney[1]
[1]*McGill University*

Endolysosomal pH is critical for neuronal plasticity. Mutations in one such regulator of this process, SLC9A6/NHE6, results in Christianson Syndrome, a severe form of X-linked intellectual disability. Yet, how how non functioning NHE6 affect cellular learning mechanisms is unknown. Here, we investigate the impact of an originally identified disease-causing mutation (p.E287-S288del, ΔES) resulting in non functioning NHE6 on mouse hippocampal pyramidal neurons. We find that ΔES expression decreased dendritic spine density. Furthermore, compared to wild-type NHE6, the ΔES mutant is directed away from endosomes toward lysosomes, impairing glutamatergic AMPA receptor trafficking. Following long-term potentiation stimulation, neurons expressing ΔES failed to undergo structural and functional changes, such as AMPA receptor recruitment into spines, enhancement of miniature excitatory postsynaptic currents, and spine head enlargement. Interestingly, synapse density and remodeling were partially restored by a lysosomal inhibitor. Overall, our results demonstrate that the ΔES mutation disrupts endosomal trafficking and neuronal plasticity, possibly leading to the learning deficits in Christianson Syndrome.

PS.9b The role of netrin 1-DCC signaling in regulating GABAAR homeostatic plasticity

Elizabeth Chan[1], Yu Tian Wang[1]
[1]*University of British Columbia*

BACKGROUND and AIM: The adaptive ability of neurons to modify their strengths in accordance to stimuli is known as synaptic plasticity. Homeostatic plasticity is a negative feedback mechanism that neurons utilize to maintain their level of excitability. Over the past decade, homeostatic plasticity in the excitatory synapses has been extensively studied. In contrast, the underlying mechanism of homeostatic plasticity in the inhibitory synapses remains largely overlooked. METHODS: We had established a robust model for the study of GABAAR homeostatic plasticity in primary neurons by inducing neuronal depolarization by blockade of GABAARs for one hour. RESULTS: By using this model, we found that blockade of GABAARs for one hour significantly increased GABAAR-mediated transmission, as evident by the increased amplitude and frequency of miniature inhibitory postsynaptic currents (mIPSCs). These results suggest that GABAAR homeostatic plasticity in matured neurons is a tightly regulated process and likely to occur through an increased function and/or number of cell surface GABAARs. Using membrane fractionation followed by immunoblotting, we observed that the increase in GABAARs during homeostatic plasticity was localized within the postsynaptic membrane, without altering the total number of the receptor on the cell surface. Interestingly, we found that the increase in GABAARs was coincided with an increase in netrin 1 detected in the extracellular media. Furthermore, bath application of netrin 1 mimicked neuronal depolarization, resulting in the increased amplitude and frequency of mIPSCs, as well as increased GABAAR expression at the postsynaptic membrane. Consistent with a critical role of netrin 1 in mediating this homeostatic synaptic scaling at the GABAergic synapse, we also detected DCC, one of the netrin 1 receptors, to be localized in close proximity to GABAARs at the inhibitory synapses. CONCLUSION: Taken together, our preliminary data suggests the novel role of netrin 1 as a diffusible regulator of GABAAR homeostatic plasticity.

PS.9c Guiding synaptic plasticity: a novel role for netrin-1 in the adult hippocampus

Stephen Glasgow[1]
[1]*Montreal Neurological Institute*

Dynamic trafficking of α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid glutamate receptors (AMPARs) to synapses is critical for activity-dependent synaptic plasticity underlying learning and memory, however the identity of key molecular effectors remains elusive. This presentation will describe recent evidence that supports a novel role for the chemotropic guidance cue, netrin-1, in synaptic transmission and plasticity. Originally described as a critical regulator of axon guidance in the developing nervous system, we have found that netrin-1 continues to be expressed in the adult brain and is enriched at dendritic spines. Moreover, netrin-1 release from dendrites can be elicited by either neuronal depolarization or N-methyl-D-aspartate receptor (NMDAR) activation, indicating that release is triggered by neuronal activity. Selective genetic deletion of netrin-1 from excitatory neurons in the adult hippocampus impairs NMDAR-dependent long-term potentiation (LTP) of excitatory synaptic responses, and significantly impairs performance in spatial memory tasks. Remarkably, exogenous netrin-1 is sufficient to trigger long-lasting potentiation of excitatory glutamatergic transmission at hippocampal Schaffer collateral synapses that is mediated by Ca2+-dependent recruitment of GluA1-containing AMPARs. Further, we show that netrin-1 regulates dendritic spine morphology, promoting the maturation of immature or nascent synapses. These findings identify a central role for activity-dependent release of netrin-1 as a critical effector of synaptic plasticity in the adult hippocampus, and suggest that chemotropic guidance cues may play key roles in synaptic modification underlying learning and memory.

PS.9d Homeostatic control of plasticity rules at CA1 synapses

Cary Soares[1], André Longtin[1], Richard Naud[1], Jean-Claude Béïque[1]
[1]*University of Ottawa*

Hebbian and homeostatic forms of plasticity operate on different time scales to regulate synaptic strength. The degree of mechanistic overlap between these processes, and their mutual influence, are still incompletely understood. To gain progress along this front, we determined the effects of a homeostatic paradigm on distinct dynamical features of synaptic function and plasticity using cellular electrophysiology in combination with a series of multiphoton-based single-synapse optical strategies. We found that the homeostatic synaptic strengthening induced by prolonged network inactivity is accompanied by a compromised ability of CA1 synapses to exhibit LTP. This effect could not be accounted for by an obvious deficit in the postsynaptic capacity for LTP expression, since neither the fraction of silent synapses nor the ability to induce postsynaptic LTP, both determined by two-photon glutamate uncaging, were reduced by the homeostatic process. Rather, optical quantal analysis, based on single-synapse imaging of a genetically-encoded glutamate sensor, revealed that homeostatically-strengthened synapses displayed a reduced capacity to maintain glutamate release fidelity during repetitive stimulation, ultimately impeding the induction, and thus expression, of LTP. Calibration procedures to determine the dynamic range and temporal constraints of the glutamate sensor and corollary statistical algorithms to infer quantal parameters of synaptic transmission will also be briefly covered. By regulating short-term dynamics of glutamate release, the homeostatic process thus influences key aspects of dynamical network function and exhibits features of metaplasticity.

Parallel symposium 10:
Growing up high: Neurobiological consequences of adolescent cannabis use

Grand Centre

Sponsored by **International Society for Developmental Neuroscience (ISDN)**

PS.10a Longitudinal relationship between adolescent cannabis use and cognitive development

Patricia Conrod[1], Mohammed Afzali[1], Josiane Bourque[2], Jean-Francois Morin[1]

[1]CHU Ste-Justine, Université de Montreal, [2]university of Pennsylvania

Alcohol and cannabis misuse are related to impaired cognition, but little is known about how males and females differ in the effects of cannabis on cognition. When inferring causality, four nonexclusive theoretical models can account for this association: 1) a common underlying vulnerability model; 2) a neuroplasticity model in which impairment is concurrent with changes in substance use but temporary because of neuroplastic brain processes that restore function; 3) a neurotoxicity model of long-term impairment consequential to substance use; and 4) a developmental sensitivity hypothesis of age-specific effects. Using a developmentally sensitive design, the authors investigated relationships between year-to-year changes in substance use and cognitive development. Method: A population-based sample of 3,826 seventh grade students from 31 schools consisting of 5% of all students entering high school in 2012 and 2013 in the Greater Montreal region were assessed annually for 4 years on alcohol and cannabis use, recall memory, perceptual reasoning, inhibition, and working memory, using school-based computerized assessments. Multilevel regression models, performed separately for each substance, were used to simultaneously test vulnerability (between-subject) and concurrent and lagged within-subject effects on each cognitive domain. Results: We previously reported that common vulnerability effects were detected for cannabis and alcohol on all domains and that cannabis use, but not alcohol consumption, showed lagged (neurotoxic) effects on inhibitory control and working memory and concurrent effects on delayed memory recall and perceptual reasoning (with some evidence of developmental sensitivity). Analysis of sex differences indicated that males demonstrated great cannabis effects on memory functions than females, but there were no sex differences in how cannabis appeared to affect inhibitory control. Conclusions: Beyond the role of cognition in vulnerability to substance use, the concurrent and lasting effects of adolescent cannabis use can be observed on important cognitive functions and appear to be more pronounced for males than females.

PS.10b Adolescent THC exposure induces molecular and neuronal neuropsychiatric endophenotypes in the mesocorticolimbic circuitry

Steven Laviolette[1]

[1]University of Western Ontario

BACKGROUND AND AIM: Clinical and pre-clinical evidence demonstrates a link between adolescent, neurodevelopmental exposure to the primary psychoactive compound in marijuana, delta-9-tetrahydrocannabinol (THC) and an increased likelihood of developing schizophrenia-related symptoms in early adulthood. METHODS: Using a rodent model of adolescent neurodevelopmental THC exposure, translational research in our laboratory combining behavioural pharmacology, molecular protein analyses and neuronal electrophysiology and Matrix Assisted Laser Desorption/Ionization (MALDI) imaging, we are causally examining the underlying molecular, neuronal and behavioural effects of adolescent THC exposure on the PFC and its regulation of sub-cortical dopamine (DA) systems. RESULTS: We have found that that adolescent THC induces a host of molecular and neuronal abnormalities in the mammalian PFC and mesolimbic circuitry that closely resemble neuropathological endophenotypes observed in schizophrenia. These effects include decreased intrinsic GABAergic inhibitory control in the PFC, sub-cortical hyperactivity in mesolimbic DA neurons and dysregulation of schizophrenia-related molecular pathways including the GSK-3, Akt and mTOR systems. In addition, adolescent THC exposure induces a host of neuropsychiatric-like affective and cognitive abnormalities including deficits in social cognition, memory processing, cognitive filtering and anxiety regulation. Remarkably, pharmacological interventions aimed at restoring GABAergic PFC function during early adulthood was found to reverse the neuropathological effects of adolescent THC exposure. In addition, co-administration with agents aimed at blocking THC-induced GABAergic and glutamatergic cortical dysregulation prevented the development of these pathological effects. CONCLUSIONS: These findings highlight the underlying molecular, neuronal and behavioural phenotypes resulting from adolescent THC exposure and how these pathological adaptations may serve as critical biomarkers for cannabinoid-related neuropsychiatric disorders. In addition, our evidence demonstrates that molecular or pharmacological interventions aimed at normalizing GABAergic and glutamatergic signaling abnormalities in the PFC may prevent or reverse these THC-induced pathological sequelae.

PS.10c The neurobiology of effort-based decision-making in cannabis use disorder

Iris Balodis[1], David Zald[1], James MacKillop[1]
[1]Peter Boris Centre for Addictions Research

BACKGROUND AND AIM: With legislation changes in Canada around cannabis legalization, understanding the public health relevance of this drug is intensifying. One priority research area around cannabis harms is the study of motivation, to date, however, few studies systematically examine the multifaceted nature of motivation in cannabis use disorder (CUD). Neuroimaging paradigms often examine responses to reward receipt, but few studies explicitly evaluate motivation to obtain rewards. Motivational mechanisms are increasingly conceptualized within the framework of effort-based decision-making; components such as reward valuation, reward anticipation, cost or effort, may each be differentially affected with cannabis use. The current neuroimaging pilot study parses out specific motivational components including reward magnitude and effort cost, to examine how these are encoded in CUD and may influence effort-based choices. METHODS: The current study presents initial neuroimaging findings from a behavioural paradigm examining effort-based decision-making in individuals with CUD relative to a healthy control (HC) group. The Effort-Expenditure for Rewards Task (EEfRT) is a validated behavioural paradigm that explores reward magnitudes and effort costs on decision-making in humans. Participants are presented with the choice between performing an 'easy-task' and a 'hard task' in which they can earn varying amounts of money with varying levels of effort (i.e. button-pressing a given amount within a short time period). The task presents effort and reward information sequentially, in order to disentangle regions tracking reward from those encoding effort costs. RESULTS: Initial neuroimaging results suggest reduced striatal responding in CUD individuals, relative to the HC group, when presented with reward information (with no effort information presented). When presented with effort requirements first (with no reward information), the CUD group shows greater activity in the anterior cingulate cortex and medial prefrontal cortex relative to the HC group. CONCLUSIONS: These initial findings suggest differences in encoding the subjective value of a monetary reinforcer and in encoding effort costs between CUD and HC groups. These findings will be discussed in the context of research challenges when conducting studies of motivational processes in CUD with special considerations for young adult populations. Understanding these brain substrates has implications for identifying neurobehavioural phenotopyes in individuals with CUD. A clearer appreciation of these substrates can make motivation a key factor in the search for CUD vulnerability factors.

PS.10d Long-term consequences of adolescent cannabinoid exposure: a closer look at learning and circuitry

Travis Todd[1], Lucas Dwiel[1], Shahnaza Hamidullah[2], Wilder Doucette[1], Jibran Khokhar[2]
[1]Dartmouth College, [2]University of Guelph

BACKGROUND AND AIM: Adolescent cannabis use occurs commonly, affects neurodevelopment, and results in behavioral changes related to reward and motivation. These reward-related changes have been studied in humans in the context of "the gateway hypothesis" and the "amotivation syndrome," however the causal nature of these two associations remains unknown. Thus we were interested in whether Δ9-tetrahydrocannabinol (THC) exposure (alone or with alcohol co-use) during adolescence would influence reward related behaviors in adulthood, and the neural correlates of these changes. METHODS: We assessed the effects of adolescent THC (or vehicle) treatments (post-natal day 28-42; 6 mg/kg i.p.) on instrumental and Pavlovian reward learning. We also performed local field potential recordings from parts of the brain reward circuit using custom built arrays targeting the nucleus accumbens, orbitofrontal cortex, and medial prefrontal cortex. In a subsequent study, we have explored the long-term consequences of adolescent (PND28-42) co-exposure to alcohol (10%, two-bottle choice) and vapourized THC (10mg/pad/kg), since co-use of these drugs is prevalent in adolescent populations. A variety of behavioural tests were performed in these animals in adulthood. RESULTS: Adolescent THC treatment significantly impaired the motivation to lever press for a food reward in the instrumental task. In the sign-tracking study, adolescent THC treatment significantly increased sign-tracking compared to vehicle treatment. This study suggests the adolescent THC exposure may produce long-term changes in reward-related behaviors. A hyperconnectivity (increased coherence) phenotype was observed in the THC treated animals compared to the vehicle treated animals across both cortico-limbic (nucleus accumbens and orbitofrontal cortex) and cortico-cortico (orbitofrontal cortex and prelimbic cortex) nodes. The early findings from the co-exposure suggest that THC vapour exposure acutely suppresses alcohol drinking (on THC exposure days) during adolescence (even though there was an overall increase in alcohol drinking in the THC exposed animals), and combined exposure to alcohol and THC produces long-lasting changes in appetitive and avoidance learning behaviours. CONCLUSIONS: These behavioral and neural circuit findings are consistent with those observed in patients and begin to uncover the causal underpinnings of the long-term consequences of adolescent THC exposure. These findings help to identify the causal changes arising from adolescent cannabinoid exposure (alone or in combination with alcohol) in brain circuitry that might contribute to the behavioural changes observed after this exposure.

Parallel symposium 11
Novel ventral hippocampus circuits in the control of affective behavior

Grand East

PS.11a Hippocampal neurogenesis and stress resilience

Christoph Anacker[1]
[1]*Columbia University*

BACKGROUND: Adult hippocampal neurogenesis has been proposed to confer resilience to chronic stress. However, it is unknown how adult-born neurons regulate information processing in the dentate gyrus granule cell network. Here, we used in vivo Ca2+ imaging with head-mounted miniature microscopes (Inscopix, CA) in the dentate gyrus of freely moving mice to investigate how young adult-born neurons regulate the response of mature granule cells during chronic psychosocial stress. METHODS: The intracellular Ca2+ indicator, GCamp6f, was virally-expressed in mature granule cells of the ventral dentate gyrus. Ca2+ activity was imaged in wild-type mice with normal levels of neurogenesis and in transgenic mice with a 2±0.2 fold increase in doublecortin-positive young neurons, due to a deletion of the pro-apoptotic gene Bax from adult neural stem cells and their progeny. We imaged 300-600 developmentally-born, mature granule cells per mouse during 10 days of social defeat stress and during subsequent tests of anxiety-like behavior. RESULTS: On the first day of social defeat, granule cells of the ventral dentate gyrus show similar Ca2+ activity in response to an attack by a dominant aggressor mouse. We also did not observe differences in the activity of the ventral dentate gyrus between wild-type mice and mice with increased neurogenesis. After chronic social defeat, mice with increased neurogenesis are resilient to stress and interact longer with a novel mouse in a social interaction test than stress-susceptible wild-type mice. On the last day of social defeat (day 10), wild-type mice also show increased Ca2+ activity in response to an attack. This effect is reduced in stress-resilient mice with increased neurogenesis. We found that the ventral dentate gyrus contains a sub-population of granule cells that selectively responds to stressful attacks (34%). While wild-type mice and mice with increased neurogenesis contain the same percentage of 'attack-responsive' cells in the ventral dentate gyrus, the activity of this cell population was reduced in stress-resilient mice with increased neurogenesis. CONCLUSION: Our findings demonstrate that hippocampal neurogenesis inhibits the response of 'stress-responsive' granule cells in the ventral dentate gyrus and confers behavioral resilience to chronic social stress.

PS.11b Ventral hippocampal contributions to learned approach-avoidance conflict processing

Rutsuko Ito[1]
[1]*University of Toronto*

An approach-avoidance (AA) conflict resolution is a form of decision making that is fundamentally important for survival and requires the effective evaluation of affective stimuli or events with mixed outcomes (positive and negative - Ito & Lee 2016). Despite the prevailing view of hippocampal function in learning and memory processes, the hippocampus is thought to be involved in the resolution of AA conflict by exaggerating the value of negative outcomes and increasing the tendency to avoid (Gray & McNaughton, 2000). Furthermore, accumulating evidence points to the ventral, but not the dorsal hippocampus, in mediating affective processes involving AA conflict (Bannerman et al., 2004; Schumacher et la., 2016). The present set of studies provides subfield-specific pharmacological and optogenetic evidence to show that the rat ventral hippocampus (vHPC) exerts differential control over approach-avoidance behaviors when animasl are exposed to affectively bivalent (conflicting) cues. More specifically, transient inactivation of the ventral CA3 or dentate gyrus led to an increase in cued approach tendency, while inactivation of the ventral CA1 led increased cued avoidance behavior in the face of AA conflict, indicating that the vHPC can bidirectionally modulate learned AA conflict resolution. These findings will be presented and discussed in the context of known intrinsic circuitry within the vHPC and the wider extrinsic connectivity of the ventral CA1 and CA3 with the septum and ventral striatum.

PS.11c Encoding of emotionally relevant stimuli in ventral hippocampal circuits

Mazen Kheirbek[1]
[1]*UCSF*

Mood and anxiety circuits are widely distributed, comprised of interconnected networks at the local and brain-wide level. Within some areas, stimuli with differing emotional valence are encoded by distinct subsets of neurons. In the ventral hippocampus (vHPC), a crucial node for anxiety-related behavior, we have recently shown that cells with distinct projection streams encode anxiety-provoking environments, and can differentially control aspects of fear learning. In this presentation I will discuss these results as well as recent work from our lab describing the functional and anatomical organization of vHPC circuits, how how the vHPC represents and learns about salient stimuli in the environment and how stable these representation are across experiences and days. These studies will highlight the rich heterogeneity of vHPC circuits, and reveal novel functional roles for the vHPC in encoding emotionally relevant stimuli and generating approach and avoidance behaviors.

PS.11d Maturation of brain circuits involved in emotional learning

Maithe Arruda Carvalho[1]
[1]*University of Toronto Scarborough*

Specific behaviours, such as the ability to walk, talk, and even retain memories throughout life, emerge at precise times during early life. Concomitantly, anatomical and morphological changes are taking place in the brain areas supporting those same behaviours. Still, how such changes influence circuit function and as a consequence affect behaviour is currently unknown. This set of studies investigated in C57BL6/J mice how anatomical connectivity and synaptic transmission within hippocampal, prefrontal cortex and amygdala circuits change across development and its implications for the maturation of emotional learning. In any functional system, determining the minimum level in which a circuit is able to function is critical in establishing how much damage that circuit can endure. Thus, elucidating the precise threshold through which emotional learning circuits become engaged and sufficient to sustain complex behaviour will yield invaluable data for when that circuit is challenged, be it through normal aging, neurodegenerative disease or stress.

Parallel symposium 12
Single-cell transcriptomic approaches for dissecting neurological disease and complex behaviours

Osgoode East

Sponsored by **the Djavad Mowafaghian Centre for Brain Health**

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PS.12a Single-cell RNA-seq identifies putative human brain cell types associated with neurodegenerative disease

Vilas Menon[1]
[1]*Columbia University Medical Center*

Over the past five years, advancements in single-cell RNA-sequencing have revolutionized the field of neuroscience, especially with respect to identifying putative molecular subtypes of cells. More recently, the development of single-nucleus RNA-seq has allowed for profiling of a wide array of cells in frozen human brain tissue, with important consequences for studying molecular changes associated with neurological disease in humans. Using droplet-based techniques, we profiled live microglia from fresh post-mortem tissue samples, as well as nuclei from all cells from frozen human brain tissue, and identified key cell types with associations to neurodegenerative and neuroimmune disorders. For microglia, this includes putative cell types with neurological disease signatures, proliferative signatures, and interferon response signatures. For other cell types, these signatures include hallmarks of activation and reactivity to pathology, as well as subtype-specific degeneration in the case of neurons. In addition, we have developed new computational techniques to identify putative cell type interactions associated with these diseases, thus generating hypotheses about pathways and cell types dysregulated in neurological disease. Ultimately, relating single-cell transcriptomics data to clinical, pathological, and disease traits provides tantalizing insight into cell type-specific molecular changes associated with various aspects of disease progression.

PS.12b Using single-cell transcriptomics to infer multi-modal cellular phenotypes

Shreejoy Tripathy[1]
[1]*University of Toronto*

Despite massive increases in the scale and applicability of single-cell genomics, translating cell-type specific transcriptomic alterations to downstream changes in cellular phenotypes has been challenging. Here, I will describe my work relating single-cell transcriptomics to neuronal electrophysiological and morphological features. I will discuss Patch-Seq, a novel method that allows assaying transcriptomics, electrophysiology, and morphology, all from the same single cell. I will describe my approaches for quality controlling Patch-Seq data and how to merge these data with higher-quality dissociated cell scRNAseq-based atlases. I will also share my recent efforts to develop machine learning algorithms for predicting cellular phenotypic features from transcriptomic data alone, making use of multi-modal datasets at the single-cell and single cell type resolution.

PS.12c Mapping transcriptomically-similar cell types across datasets, species, and conditions using MetaNeighbor

Megan Crow[1]
[1]*Cold Spring Harbor Laboratory*

Single cell RNA-sequencing technology (scRNA-seq) provides a new avenue to discover and characterize cell types, but the experiment-specific technical biases and analytic variability inherent to current pipelines may undermine its replicability. Cross-dataset comparison is further hampered by the use of ad hoc naming conventions. To address this we developed MetaNeighbor, a tool that quantifies the degree of cell type replicability across datasets and enables rapid identification of clusters with high similarity. In my talk, I will provide an overview of MetaNeighbor and describe our efforts to benchmark and apply the method to assess neuronal identity across diverse datasets. Across tasks we find that large sets of variably expressed genes can identify replicable cell types with high accuracy, suggesting a general route forward for large-scale evaluation of scRNA-seq data.

PS.12d Subtype-specific predisposition of granule cell participation in hippocampal processing

Mark Cembrowski[1], **Sarah Erwin**[2], **Nelson Spruston**[2]
[1]*University of British Columbia,* [2]*Howard Hughes Medical Institute*

BACKGROUND AND AIM: Memory is a critical process for the survival and well-being of organisms. Given this importance, clarifying the neural computation of memory - how the brain forms, stores, and extracts memories - is a focal point of basic neuroscience. One of the main goals of this research lies in determining the precise rules by which neurons are used to encode and retrieve memories. We sought to clarify these rules in the mouse hippocampus, examining the cell-type-specific logic by which input dentate gyrus granule cells are recruited in behavior. METHODS: To identify specific subtypes of granule cells and map them to spatial locations, we combined single-cell next-generation RNA sequencing and in situ hybridization. To interpret these cell types in the context of higher-order physiological and behavioural correlates, we used brain slice recordings ex vivo and activity labeling driven by mouse behaviour in vivo. RESULTS: Although the dentate gyrus is comprised of two blades that have classically been thought of as homogeneous, our work reveals a host of blade-specific structural and functional differences. Structurally, we find that granule cells can be divided into discrete subtypes that are spatially interleaved but biased to different blades of the dentate gyrus. Functionally, these subtypes differentially participate in encoding and retrieval of hippocampal-dependent memory. CONCLUSIONS: Our findings illustrate that intrinsic, subtype-specific predisposition occurs in the initial cellular trace of hippocampal-associated memory.

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Centre for Neuroscience Studies at Queen's University (T08)

At the forefront of discovery and innovation is the Centre for Neuroscience Studies (CNS) at Queen's University. The multidisciplinary graduate program is a hub for research and teaching aimed at improving the understanding of the brain, how it works and how new therapies and diagnoses can play an important role in the prevention and treatment of diseases like Parkinson's, Alzheimer's, Stroke, Obesity, Fetal Alcohol Syndrome Disorder, Schizophrenia, Mood Disorders and Depression. The Centre for Neuroscience Studies welcomes applications from students from a variety of different academic backgrounds. Visit the Neuroscience website to learn more.

www.neuroscience.queensu.ca

conwaya@queensu.ca

Doric (T07)

DORIC is a global forward-thinking brand who provides neurophotonics hardware and software tools that facilitate and bolster the latest trend in behavioural studies on freely moving animals. It sets standards for: Light sources, Fiber-optic rotary joints (1x1, 1x2, 2x2, electro-optical, assisted), Fiber-optic cannulas or brain implants, Miniaturized fluorescence microscopes, Fiber photometry system. Thanks to our systems, it is possible to combine microscopy or photometry with electrophysiology, optogenetics, fluid delivery and more. Discover the latest developments for the miniaturized fluorescence microscopy and a new level of integration for the fiber photometry systems.

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eNUVIO inc. (Booth 07)

eNUVIO is a Canadian biotechnology company based in Montreal that designs and develops lab-on-a-chip devices for cell biologists and electrophysiologists. Using their patented microfabrication technology and with over three decades of combined research experience, eNUVIO provides cutting-edge tools for the research needs of life scientists.

www.enuvio.com

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info@enuvio.com

FUS Instruments Inc. (Booth 22)

FUS Instruments produces focused ultrasound research systems, with a special emphasis on neuroscience applications. The company technology can be used to explore the brain applications of focused ultrasound including non-invasive opening of the BBB, neuromodulation, and ablation.

www.fusinstruments.com

rchopra@fusinstruments.com

g.tec neurotechnolgy USA, Inc. (Booth 27)

g.tec developed the first commercially available BCI system in 1999 and now sells this system in more than 60 countries worldwide. All hardware and software developments are done in-house by researchers, engineers and developers, and work with all major BCI approaches (motor imagery, P300, SSVEP and slow cortical potentials). g.tec is an active member in a number of national and international research projects and scientific publishing. g.tec's BCI technologies have been tested on more than 500 subjects internationally to guarantee a perfect working system.

www.gtec.at

office@gtec.at

Gene Tools, LLC (Booth 17)

Gene Tools manufactures Morpholino oligos for blocking translation, modifying splicing or inhibiting miRNA activity. Morpholinos are used in cell cultures, embryos or, as Vivo-Morpholinos, in adult animals. Morpholinos are effective, specific, stable and non-toxic. Backed by Ph.D.-level customer support, Gene Tools designs and synthesizes Morpholinos and offers cytosolic delivery options.

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Hello Bio (T05)

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INCF (T11)

INCF advances data reuse and reproducibility in brain research by coordinating the development of Open, FAIR, and Citable tools and resources for neuroscience The global INCF network supports the development of neuroinformatics as a discipline, moves neuroscience towards FORCE (a FAIR, Open, Research-object based, Citable Ecosystem), provides coordination of global neuroscience infrastructure through the development and endorsement of consensus-based standards and best practices, and trains scientists, administrators, and students in using neuroinformatics tools and methods.

www.incf.org

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Inscopix, Inc. (Booth 25)

Decoding the neural language of the brain is the defining scientific challenge and opportunity of the 21st Century. Inscopix is a discovery phase neurotechnology company based in Palo Alto developing a platform for real-time brain mapping. We bring together deep domain expertise in neuroscience, physics, engineering, software development, and data science and is enabling radically new approaches to understanding the brain in health and disease. nVista and nVoke, our flagship products, are used in research institutions across the world, and have resulted in top-tier scientific publications on brain circuits implicated in learning, memory, cognition, and in diseases such as Parkinson's.

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Integrated Program in Neuroscience (McGill University) (Booth 28)

The Integrated Program in Neuroscience (IPN) at McGill is one of the largest contemporary graduate neuroscience programs in the world. We offer opportunities for graduate studies in a variety of basic and clinically-applied neuroscience disciplines at the Master's and Doctoral levels. With over 300 independent scientists enrolled in IPN, excellent opportunities exist for research in molecular, cellular, systems, behavioral and cognitive neuroscience. IPN also fosters a supportive student community via GSAN (Graduate Students' Association for Neuroscience), and encourages public service via BrainReach, a student-run community outreach program that teaches neuroscience to young individuals.

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Lafayette Instrument Company (Booth 19)

Lafayette Instrument Company is proud to offer Animal Behavior and Tissue Sectioning equipment that lead the industry not only in breadth, application and ease of use but also in their state-of-the-art design. Come visit us for an explanation of our Touchscreen Chambers, Operant Chambers, Activity and Feeding Systems, Running Wheels, and Vibrating Microtomes. Talk to us; we have the products, partnerships, and experience necessary to assist you in outfitting your laboratory with off-the-shelf or customized solutions!

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Laserglow Technologies (Booth 05)

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MED Associates Inc. (Booth 06)

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www.med-associates.com
bernadette.boucher@med-associates.com

Mightex (Booth 23)

Mightex develops cutting-edge all-optical imaging and stimulation tools to enable researchers to push the boundaries of neuroscience. Our Polygon400 patterned illuminator can be mounted on any microscope for targeted optogenetics of select neurons with sub-cellular resolution. For in vivo studies, researchers can perform simultaneous calcium imaging and targeted optogenetic stimulation in freely-behaving animals using our OASIS Implant. Image large cortical areas with targeted optogenetics in a head-fixed animal using our OASIS Macro. Our new high-power Polygon400 will support targeted optogenetics in the deep-brain or across large cortical regions.

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MKS Spectra-Physics (T06)

Spectra-Physics is a brand within the MKS Instruments Light & Motion division. The Spectra-Physics product portfolio consists of a broad spectrum of lasers for precision industrial and scientific research applications. Spectra-Physics products combine groundbreaking laser technologies with deep applications expertise to deliver disruptive performance and lower total cost of ownership. From the manufacturing floor and semiconductor fab to the research laboratory, Spectra-Physics lasers enhance our customers' capabilities and productivity in the semiconductor, industrial technologies, life and health sciences, and research markets. For more information:

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Neurescence (Booth 13)

At Neurescence our goal is to help understanding the brain If your research can benefit from simultaneous monitoring of neuronal activity, through calcium imaging, in multiple brain areas and even the spinal cord in freely behaving rodents, come and talk to us!

yasi.soudagar@gmail.com

Nikon Canada Inc. (Booth 29)

Nikon Instruments, (Canada) Inc. is a world leader in the development and manufacture of optical and digital imaging technology for biomedical applications. Now celebrating its 100th anniversary, Nikon provides complete optical systems that offer optimal versatility, performance and productivity. Cutting-edge instruments include microscopes, digital imaging products and software.

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Noldus Information Technology (Booth 21)

Noldus Information Technology: powerful software tools, fully integrated labs, and expert consultancy. We have been making professional tools and instruments for animal behavior research for more than 25 years. These products enable the collection, integration, analysis, management, and presentation of behavioral and other data. Our product range for neuroscience research includes EthoVision XT video tracking, The Observer XT behavior annotation, CatWalk XT footprint and gait analysis, ErasmusLadder cerebellar phenotyping, PhenoTyper home cage testing, DanioScope zebrafish embryo and larvae measurements, and DanioVision zebrafish larvae activity monitoring.

www.noldus.com

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Olympus (Booth 14)

Olympus is a global technology leader, crafting innovative optical and digital solutions in medical technologies; life sciences; industrial solutions; and cameras and audio products. Throughout our nearly 100-year history, Olympus has focused on being true to society and making people's lives healthier, safer and more fulfilling every day.

www.olympus-lifescience.com

rebecca.lowe@olympus-ossa.com

Parkinson Canada (T03)

Parkinson Canada is the definitive voice of the Parkinson community in Canada. It provides services, support and education about Parkinson?s disease to individuals, caregivers and the health professionals that treat them. Operating since 1965, the organization advocates on issues that concern the Parkinson's community in Canada. The Parkinson Canada Research Program funds innovative research for better treatments and a cure, investing invest close to $29 million in 552 research projects since 1981. Parkinson Canada is a national registered charity and an Imagine Canada accredited organization.
t: 1(800) 565-3000

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PeproTech, Inc (Booth 18)

PeproTech creates the building blocks of your life science research by manufacturing high-quality products that advance scientific discovery and human health. Since 1988, PeproTech has grown into a global enterprise manufacturing an extensive line of Recombinant Human, Murine and Rat Cytokines, Animal-Free Recombinant Cytokines, Monoclonal Antibodies, Affinity Purified Polyclonal Antibodies, Affinity Purified Biotinylated Polyclonal Antibodies, ELISA Development Kits, Cell Culture Media Products and GMP Cytokines.

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Plexon Inc (Booth 10)

Plexon is a pioneer and leading innovator of custom, high performance data acquisition, behavior and analysis solutions specifically designed for scientific research. We collaborate with and supply thousands of customers including the most prestigious neuroscience laboratories around the globe driving new frontiers in areas including basic science, brain-machine interfaces (BMI), neurodegenerative diseases, addictive behaviors and neuroprosthetics. Plexon offers integrated solutions for in vivo neurophysiology, optogenetics and behavioral research – backed by its industry-leading commitment to quality and customer support.

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Ripple Neuro (Booth 09)

A leader in systems for electrophysiology and neuromodulation, Ripple Neuro creates neural interfaces and medical devices to advance research and improve the lives of underserved patient populations through the thoughtful application of technology and design.

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RWD Life Science (Booth 24)

Since 2002, RWD Life Science has been the world leading manufacturer for pre-clinical research laboratory instruments in animal model, we specialize in producing Inhalation Anesthesia Machines, Active Gas Scavenger, Stereotaxic Instruments, Cannula Implantation System, MCAO Sutures, Stainless Steel Mouse and Rat Brain Matrix, Optogenetic Stimulation Solutions, Animal Ventilator and Temperature Controller, and more than 1,000 kinds of Surgical Tools. For more information about our products, please check:

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SensoMedical develops neurotechnology products. We understand how technology interfaces with the nervous system, and we leverage our expertise in fields such as electrophysiology, biology, materials science, mechanical engineering, and regulatory to focus exclusively on developing products for neurology and neuroscience - from prototyping to production. SensoMedical has perfected the process of neurotechnology research and design over the years, and we are passionate about bringing to life the vision of both entrepreneurs, startups and established companies. SensoMedical is your neurotechnology partner.

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m.mento@sensomedical.com

STEMCELL Technologies (Booth 12)

STEMCELL Technologies Inc. is a leader in the development of specialty cell culture media, cell separation products and accessory products to support life science research. The STEMdiff Cerebral Organoid Kit provides a simple, optimized protocol and everything needed to culture brain organoids. We also offer BrainPhys for the culture of active hPSC- and primary tissue-derived neurons, the NeuroCult product line for primary and CNS-derived neural stem cells, and the STEMdiff Neural System for each step of your iPS-neural workflow. Learn more at:

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Stoelting Co. (Booth 20)

Stoelting Co. has been a leader in neuroscience research equipment since 1886. Our current line of stereotaxic instruments is world-renowned, with such products as the classic Lab Standard to the Motorized Lab Standard with software controlled movement of the manipulator arms. Moreover, Stoelting has expanded its product line with ANY-maze; a video tracking software system for recording behavior. This easy to use video tracking system requires only a laptop computer and web camera to begin tracking ANY animal using ANY maze.

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Richard@StoeltingCo.com

StressMarq Biosciences Inc. (Booth 01)

StressMarq Biosciences is a research reagents company manufacturing antibodies, proteins, ELISA kits and small molecules for the research sector. It has specialties dual specialties in neuroscience and stress-response research products. Of particular note for the neuroscience sector are active alpha synuclein and tau proteins - both monomers and recombinant seeds capable of generating Lewy-Body pathology and tauopathies respectively - as well as accompanying antibodies. A wide number of post-translational modification antibodies are also available, including for N-terminal arginylation, tyrosine sulphonation, acrolein, hexanoyl lysine and others. StressMarq markets all over the world.

www.stressmarq.com

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ariell@stressmarq.com

The Canadian Neurophonics Platform (T10)

The Canadian Neurophotonics platform is composed of three core production facilities that produce novel tools in a collaborative way. Development and optimisation is further enabled through testing and validation of the tools by Centres of excellence across Canada.

www.neurophotonics.ca

mario.methot@neurosciences.ulaval.ca

Toronto Dementia Research Alliance (T01)

TDRA is a University of Toronto collaboration which aims to better understand, prevent and treat dementia. Together with our partners, we strive to build a scientific infrastructure that embeds research into care to advance the management and treatment for vascular and neurodegenerative disorders across the ages and stages.

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Toronto Research Chemicals (T04)

Toronto Research Chemicals, TRC was founded in 1982 to manufacture and supply researchers in the biomedical fields with specialized complex organic small molecules not otherwise commercially available. Today, Toronto Research Chemicals Inc. employs more than 200 full-time staff, of which approximately 100 are Ph.D.'s and MSc's, operating in 120,000 square feet of facilities, including 15 production laboratories, in Toronto, Canada. TRC currently offers an extensive catalog in excess of 200,000 products with an extensive inventory for immediate shipment. Where stock is unavailable, TRC will undertake production of new and known compounds upon customer order.

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sumeet.gullaiya@trc-canada.com

Tucker Davis Technologies (Booth 03)

Tucker-Davis Technologies (TDT) provides products for basic and applied research in the neurophysiology, hearing, and speech sciences as well as for general data acquisition applications. We offer a complete line of modular DSP-based data acquisition and stimulus generation systems. At TDT, we work closely to achieve our common goal: to supply you with the highest quality, most up-to-date technology available at an affordable price. We believe we can best meet this goal when all areas of our business work together in a cooperative and collaborative environment.

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Viewpoint Life sciences (Booth 15)

VIEWPOINT is the worldwide leader in tools to automate behaviour analysis on Zebrafish, rats, mice, primates, based on videotracking. We offer continuous development to adapt to customer?s requests. Our canadian office is in Montreal, QC. Our products: VIDEOTRACK : rodents behavior in mazes GAIT LAB automated catwalk analysis, VIGIE PRIMATES behavior on primates and dogs MARLAU Cages : standardized enrichment SLEEP DEPRIVATION SYSTEM ZEBRALAB : behavior analysis for Zebrafish and other fishes VISIOBOX : Zebrafish Visual Behavior TOXMATE : Multi Species Behavior Monitoring Tool HAMLET TEST : topographic Memory JETBALL:Phenosys virtual reality and much more ...

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Session 3: Saturday, May 25
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The poster board numbers work in the following way: Session – Theme – Board number (e.g 1-A-1)

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All abstracts are available to view online at can-acn.org, or on the CAN App – scan the QR code to download the app or search for 'Canadian Association for Neuroscience' or 'CAN ACN' in the App Store.

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Sponsored by **International Society for Developmental Neuroscience (ISDN)**

Session 1 – Thursday, May 23

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[1]McGill University, [2]UFRGS

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[1]Universidade Federal do Rio Grande do Sul, [2]Univeridade Federal do Espírito Santo, [3]McGill University, [4]Ludmer Centre for Neuroinformatics and Mental Health

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[1]Sunnybrook Research Institute

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[1]Piracicaba Dental School-UNICAMP, [2]McGill University, [3]Universidade Federal de São Paulo (UNIFESP)

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[1]Université de Montréal, [2]CHU Sainte-Justine Research Center/Université de Montréal

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[1]Queen's University

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Farin B. Bourojeni[1], Artur Kania[2]

[1]McGill University, [2]Institut de Recherche Clinique de Montreal (IRCM)

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[1]University of Calgary, [2]Medical University of South Carolina, [3]Emory University, [4]University of North Carolina at Chapel Hill

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[1]University of Calgary

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[1]University of Toronto, [2]Sunnybrook Research Institute, [3]University of Calgary, [4]University of Luxembourg, [5]National Institutes of Health, [6]Lethbridge University, [7]Instituto Gulbenkian de Ciência

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[1]University of Toronto, [2]The Hospital for Sick Children, [3]University of Toronto and The Hospital for Sick Children (SickKids)

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[1]University of Toronto

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[1]University of Toronto

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[1]The Ottawa Hospital Research Institute, [2]University of Ottawa

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[1]Ottawa Hospital Research Institute

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[1]University of Manitoba

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[1]University of Toronto

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[1]University of Montreal

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[1]University of Calgary

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[1]McGill University, [2]Douglas Institute, McGill University

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[1]University of Guelph

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[1]University of Manitoba, [2]University of British Columbia

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[1]Western University, [2]University of Western Ontario

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[1]BioLegend, [2]Children's Hospital Boston

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[1]University of Victoria, [2]Deutsches Zentrum für Neurodegenerative Erkrankungen, [3]University of Toronto

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[1]University of Texas Southwestern Medical Center, [2]Vanderbilt University

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[1]UBC Okanagan

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[1]Montreal Neurological Institute, McGill, [2]McGill University

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[1]University of British Columbia

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[1]CERVO Brain Research Centre

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[1]University of British Columbia, Djavad Mowafaghian Centre for Brain Health, [2]University of British Columbia

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[1]McGill University

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[1]University of Toronto, [2]Sunnybrook Research Institute

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[1]The Hospital for Sick Children

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[1]York University, [2]Krembil Research Institute

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[1]Temple University, [2]University of Connecticut

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[1]Hotchkiss Brain Institute, [2]University of Calgary

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[1]University of Calgary

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[1]Faculté de médecine de Sousse, [2]Laboratoire des Interfaces et des Materiaux Avances (LIMA), Faculté des Sciences de Monastir

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[1]University of Calgary, [2]UCLA, [3]Hotchkiss Brain Institute

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[1]The University of Hong Kong

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[1]Queen's University

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[1]Queen's University

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[1]Université de Montréal

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[1]UCD AMC

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[1]University of Toronto Mississauga

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[1]University of Alberta

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[1]University of Toronto, [2]University of Toronto Mississauga

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[1]CRCHUM - Université de Montréal

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[1]York University, [2]Albert Einstein College of Medicine

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[1]McGill University

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[1]Neuroscience Axis, CHU de Québec Research Center (CHUL), [2]Krembil research Institute, University Health Network, [3]New York University

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[1]McGill University

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[1]SickKids Research Institute, [2]The Hospital for Sick Children

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[1]CERVO Brain Research Centre, Université Laval, [2]Centre for Neural Dynamics, University of Ottawa

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[1]McGill University

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[1]Division of Medical Sciences, University of Victoria

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[1]University of Guelph, [2]University of Salerno

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[1]McGill University, [2]Singapore Institute for Clinical Genetics, [3]Genome Institute of Singapore, [4]Universidade Federal do Rio Grande do Sul

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[1]Baycrest

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[1]The Rockefeller University, [2]Memorial Sloan Kettering Cancer Center

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[1]Team NeurON - Texila American University, [2]Texila American University

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[1]Krembil Research Institute, [2]Krembil Research Institute | Division of Neurology, Department of Medicine, University of Toronto, [3]University of Toronto, [4]Krembil research Institute, University Health Network

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[1]Texila American University, [2]Team NeurON - Texila American University, [3]Saginaw Valley State University

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[1]CCBN, University of Lethbridge, [2]Lethbridge University

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[1]McGill University

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[1]McGill University

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[1]University of British Columbia

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[1]Texila American University, [2]Team NeurON - Texila American University, [3]Saginaw Valley State University

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[1]McGill University

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[1]Texila American University, [2]Team NeurON - Texila American University, [3]Saginaw Valley State University

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Jeremy Toma[1], Matt Carr[1], Scott Yuzwa[2], Adelaida Kolaj[1], David Kaplan[1], Freda Miller[1]

[1]The Hospital for Sick Children, [2]University of Toronto

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[1]University of Calgary, [2]Université Laval, [3]CHU de Québec - Université Laval, [4]Rush Alzheimer's disease Center

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[1]University of Sherbrooke

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[1]Carleton University

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Matthew Demmings[1], Sean Cregan[2]

[1]University of Western Ontario/ Robarts Research Institution, [2]University of Western Ontario

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[1]York University

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[1]University of Guelph, [2]Massachusetts General Hospital, [3]Harvard University

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[1]University of British Columbia, [2]University of Toronto

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Amirali Toossi[1], Dirk Everaert[2], Richard Uwiera[2], David Hu[2], Kevin Robinson[3], Ferrante Gragasin[2], Vivian Mushahwar[2]

[1]University of Toronto, University Health Network, [2]University of Alberta, [3]Belmont University

1-C-84 ***Longitudinal measures of lesion volume correlates with neurobehavioral deficits in a non-human primate model of stroke***

Gabriel Ramirez-Garcia[1], Juan Fernandez-Ruiz[1], Joe Nashed[2], Douglas-James Cook[3]

[1]Universidad Nacional Autónoma de México, [2]Queen's University, [3]Queen's University / Kingston Health Sciences

1-C-85 ***Alzheimer's disease biomarkers in cerebrospinal fluid of nonhuman primates***

Emma Robertson[1], Susan Boehnke[1], Brittney Armitage-Brown[1], Robert Wither[1], Natalia Lyra e Silva[1], DJ Cook[1], Ron Levy[1], Fernanda De Felice[1], Douglas Munoz[1]

[1]Queen's University

1-C-86 ***Quantifying upper limb bradykinesia, rigidity and postural instability using the KINARM Robot in Parkinson's Disease***

Pauline Gaprielian[1], Ron Levy[1], Stephen Scott[1], Catherine Lowry[1], Giovanna Pari[1], Stuart Reid[1]

[1]Queen's University

1-C-87 ***Investigating adult neurogenesis in the Parkin/PolG mouse model of Parkinson's Disease***

Maria Bilen[1], Richard Harris[1], Mohamed Ariff Iqbal[1], Ruth Slack[1]

[1]University of Ottawa

1-C-88 ***Accumulation of modifications in the tau core region during the tau aggregation process in Alzheimer's disease***

Pieter Beerepoot[1], Hendrik Wesseling[1], Waltraud Mair[1], Michaela Svrdlikova[1], Long Cheng[1], Hanno Steen[1], Judith Steen[1]

[1]Boston Children's Hospital/Harvard Medical School

1-C-89 ***Systematic phenomics analysis of ASD-associated genes defines shared and unique functions and identifies parallel genetic networks underlying hypersensitivity and impaired habituation***

Troy McDiarmid[1], Manuel Belmadani[1], Joseph Liang[1], Fabian Meili[1], James Rand[2], Kota Mizumoto[1], Kurt Haas[1], Paul Pavlidis[1], Catharine Rankin[1]

[1]University of British Columbia, [2]Oklahoma University

1-C-90 ***Retrograde amnesia and reduced perseveration in the Morris water task after repeated seizures***

Kassidy Roberts[1], Lianne Brandt[1], Hugo Lehmann[1], Neil Fournier[1]

[1]Trent University

1-C-91 ***Effects of dance therapy on balance and affect in Parkinson's disease***

Sarah Ciantar[1], Eden Champagne[1], Benjamin Patrick[1], Karolina Bearss[1], Rebecca Barnstaple[1], Tenzin Chosang[1], Josilyn Weidman[1], Olivia Morson[1], Joseph DeSouza[1]

[1]York University

1-C-92 ***Continuous spike waves of slow-wave sleep extends into adulthood***

Soumia Djarir[1], Inna Voloh[1], Dragna Jovanovic[1], Mohaddeseh Gholizadeh[1] Paul Hwang[1],

[1]University of Toronto

1-C-93 ***Evaluation of the comparative effect of epigallocatechin gallate alone and in combination with progesterone in experimental model of cerebral ischemia in mice***

Harjeet Kaur[1], Amitava Chakrabarti[2]

[1]Panjab University, [2]PGIMER, Chandigarh

1-C-94 ***Genetic alterations in brain tissue samples from living Parkinson's disease patients***

Simon Benoit[1], Hu Xu[1], Roumiana Alexandrova[2], Bhooma Thiruvahindrapuram[2], Gaganjot Kaur[2], Matthew Hebb[1]

[1]University of Western Ontario, [2]The Hospital for Sick Children

1-C-95 ***Bi-rhythmic biomimetic electrical stimulation paradigm for seizure suppression***

Uilki Tufa[1], Liang Zhang[2], Peter Carlen[3], Berj Bardakjian[1]

[1]University of Toronto, [2]University Health Network, [3]Krembil Research Institute

1-C-96 ***The anti-aging protein klotho mitigates cytotoxicity of β-amyloid peptides in cellular model of Alzheimer's disease***

Mohsen Sedighi[1], Tourandokht Baluchnejadmojarad[1], Mehrdad Roghani[2]

[1]Iran University of Medical Science (IUMS), [2]Shahed University

1-C-97 ***Activity dependent neuroprotection in the acute phase after stroke***

Matilde Balbi[1], Dongsheng Xiao[1], Louis-Philippe Bernier[1], Matthieu Vanni[1], Jamie Boyd[1], Jeffrey LeDue[1], Brian MacVicar[1], Timothy Murphy[1]

[1]University of British Columbia

1-C-98 ***Unstable stalled polysomes underlie dysregulated protein synthesis in human IPSC-derived Fragile X neurons***

Jesse Langille[1], Gilles Maussion[1], Thomas Durcan[1], Wayne Sossin[1]

[1]McGill University

1-C-99 ***Effect of docosahexaenoic acid (DHA) at the enteric level in a synucleinopathy mouse model***

Jérôme Lamontagne-Proulx[1], Katherine Coulombe[2], Cédric Guyaz[3], Mélissa Côté[2], Cyntia Tremblay[2], Frédéric Calon[3], Denis Soulet[2]

[1]Centre hospitalier de l'université Laval, [2]CHU de Québec - Université Laval, [3]Université Laval

1-C-100 ***Neuroprotection and immunomodulation in the gut of parkinsonian mice with a plasmalogen precursor***

Jérôme Lamontagne-Proulx[1], Jordan Nadeau[1], Tara Smith[2], Mélanie Bourque[1], Sara Al Sweidi[1], Dushmanthi Jayasinghe[2], Shawn Ritchie[2], Thérèse Di Paolo[1], Denis Soulet[3]

[1]Centre hospitalier de l'université Laval, [2]Med-Life Discoveries, [3]CHU de Québec - Université Laval

1-C-101 ***Evaluating efficacy of small molecules predicted by artificial intelligence to reduce a-synuclein oligomers***

Kevin Siyue Chen[1], William Ryu[1], Suneil Kalia[1], Lorraine Kalia[1]

[1]University of Toronto Faculty of Medicine

1-C-102 ***Optic Ataxia in Alzheimer's: Structural alterations and their underlying substrates in correlations with "How" stream Visual Pathways***

Ganesh Elumalai[1], Divya Singh[2], Panchanan Maiti[3], Geethanjali Vinodhanand[1], Nitisha Dyal[2], Valencia Lasandra Camoya Brown[2], Nitya Akarsha Surya Venkata Ghanta[1]

[1]Team NeurON - Texila American University, [2]Texila American University, [3]Saginaw Valley State University

1-C-103 ***Neural- derived biomarkers for antidepressant drug response from plasma exosomes.***

Saumeh Saeedi[1], Corina Nagy[1], Jean-Francois Theroux[1], Marina Wakid[1], Naguib Mechawar[2], Gustavo Turecki[1]

[1]Douglas Institute, McGill University, [2]McGill University

1-C-104 ***Logopenic aphasia tau pathology: An observation on phonological loop fiber-specific white matter reductions in Alzheimer's disease - Is it a causal or casual link?***

Venkata Harikrishna Yadav Kurra[1], Ganesh Elumalai[1], Panchanan Maiti[2], Zipho Lonwabo Godlo[1], Christina Vadiyala[1], Agunva Chinonso Godwin[1], Geethanjali Vinodhanand[1], Nitya Akarsha Surya Venkata Ghanta[1]

[1]Team NeurON - Texila American University, [2]Saginaw Valley State University

1-C-105 ***Incentive-dependent waiting impulsivity failure in stimulant addiction***

Peter Zhukovsky[1], Sharon Morein-Zamir[2], Chun Meng[1], Jeffrey Dalley[1], Karen Ersche[1]

[1]Cambridge University, [2]Anglia Ruskin University

1-C-106 ***Adiponectin can rescue hippocampal synaptic plasticity in a mouse model of Fragile X Syndrome***

Luis Eduardo Bettio[1], Elizabeth Brockman[1], Suk-Yu Yau[2], Brian R Christie[1]

[1]University of Victoria, [2]The Hong Kong Polytechnic University

1-C-107 ***Cellular and behavioural characterization of a novel rat model of concomitant traumatic brain and spinal cord injuries.***

Morgane Regniez[1], Valerie Mongrain[2], Marina Martinez[1]

[1]Centre de Recherche de l'Hôpital du Sacré-Coeur de Montréal, [2]Université de Montréal

1-C-108 ***CRISPR-Cas9 gene editing of CDK5RAP2 in human pluripotent stem cells and formation of cerebral organoids for disease modeling***

Leon Chew[1], Adam Añoneuvo[1], Adam Hirst[1], Erin Knock[1], Allen Eaves[1], Terry Thomas[1], Sharon Louis[1], Vivian Lee[1]

[1]STEMCELL Technologies Inc

1-C-109 ***Identifying novel roles for Protein Disulfide Isomerase (PDI) in Amyotrophic Lateral Sclerosis (ALS)***

Sina Shadfar[1], Hamideh Shahheydari[1], Sonam Parakh[1], Angela Laird[1], Julie Atkin[1]

[1]Faculty of Medicine and Health Sciences, Macquarie University

1-C-110 ***Investigating the early decline of neural stem cells in a mouse model of Alzheimer's disease***

Richard Harris[1], Bensun Fong[1], David Cook[1], Daniel Figeys[1], Ruth Slack[1]

[1]University of Ottawa

1-C-111 ***Initiating a neuronal reprogramming strategy targeting the motor cortex in a mouse model of ALS***

EunJee Park[1], Kelly Coultes[2], Carol Schuurmans[2], Isabelle Aubert[2], Janice Robertson[1]

[1]University of Toronto, [2]Sunnybrook Research Institute

1-C-112 ***Optic nerve injury induces necroptosis in retinal ganglion cells***

Philippe D'Onofrio[1], Alireza Shabanzadeh[1], Brian Choi[1], Paulo Koeberle[1]

[1]University of Toronto

1-C-113 ***Anxiety in Parkinson's disease: the role of the locus coeruleus-stress circuitry***

Mohsen Seifi[1], Jerome Swinny[1]

[1]University of Portsmouth

1-C-114 ***Molecular and functional characterisation of Alzheimer's disease (AD) pathology in the mouse intestine: implications for novel therapies to treat intestinal dysfunction in AD***

Adina Gibbard[1], Mohsen Seifi[1], Jerome Swinny[1]

[1]University of Portsmouth

1-C-115 ***Regulating PTEN recruitment reduces CNS ischemic and traumatic injury***

Alireza Shabanzadeh Pirsaraei[1], Philippe M. D'Onofrio[1], Philippe M. Monnier[2], Paulo D. Koeberle[1]

[1]University of Toronto, [2]University of Toronto, Krembil Research Institute

1-C-116 ***Delayed post-traumatic neuronal death in the developing hippocampus***

Trevor Balena[1], Lauren Lau[1], Negah Rahmati[1], Kyle Lillis[1], Kevin Staley[1]

[1]Massachusetts General Hospital

1-C-117 ***Perturbations in nuclear-cytoplasmic transport on stress granule dynamics: implications in ALS.***

Joseph-Patrick Clarke[1], Jocelyn Mauna[1], Christopher Donnelly[1]

[1]University of Pittsburgh

1-C-118 Do patterns matter: The effects of phasic vs. tonic locus coeruleus activation on similar odor discrimination learning

Abhinaba Ghosh[1], Faghihe Massaeli[1], Sarah Torraville[1], Vanessa Strong[1], Carolyn Harley[1], Xihua Chen[1], Qi Yuan[1]

[1]Memorial University of Newfoundland

1-C-119 ***Temporal self-appraisal in developmental amnesia***

Julia Halilova[1], Donna Rose Addis[2], R. Shayna Rosenbaum[1]

[1]York University, [2]Rotman Research Institute, Baycrest Hospital

1-C-120 ***Degeneration of the nigro-striatal dopaminergic neurons in a rat model of chronic hyperglycemia.***

Maria-Grazia Martinoli[1], Justine Renaud[1], Jimmy Bealieu[1], Valentina Bassareo[1], AnnaLisa Pinna[2], Nicola Simola[2]

[1]Université du Québec, [2]University of Cagliari

1-C-121 ***Susceptibility to micro-circulatory obstructions can predict brain region specific vessel loss with aging***

Ben Schager[1], Craig Brown[1]

[1]University of Victoria

1-C-122 ***Age-related changes in the free water compartments of grey and white matter are associated with depression and mild cognitive impairment***

John A Anderson[1], Benoit Mulsant[2], Nathan Herrmann[2], Linda Mah[2], Alastair Flint[2], Corrine Fischer[2], Bruce Pollock[2], Tarek Rajji[2], Aristotle Voineskos[2]

[1]CAMH, [2]University of Toronto

D - Sensory and motor systems

1-D-123 ***Implicit and explicit learning in response to novel arm dynamics***

Julia Zdybal[1], Rodrigo Maeda[1], Andrew Pruszynski[1]

[1]University of Western Ontario

1-D-124 ***Responses to infant vocalizations in oxytocin neurons***

Silvana Valtcheva[1], Robert Froemke[1]

[1]NYU School of Medicine

1-D-125 ***Role of TASK channels at the hypoglossal motor nucleus in modulating motor output***

Patrick Gurges[1], Hattie Liu[1], Richard Horner[1]

[1]University of Toronto

1-D-126 ***Audiovisual multisensory processing in university aged adults with attention-deficit/hyperactivity disorder***

Heather McCracken[1], Bernadette Murphy[1], James Burkitt[1], Cheryl Glazebrook[2], Paul Yielder[1]

[1]University of Ontario Institute of Technology (UOIT), [2]University of Manitoba

1-D-127 ***How does closed-loop feedback generate neural and behavioral responses to weak sensory input?***

Chelsea Kim[1], Maurice Chacron[1]

[1]McGill University

1-D-128 ***Changes in connectivity to DI3 interneurons and spinal motoneurons following spinal cord injury in mice***

Sara Goltash[1], Fariba Sharmin[1], Tuan Bui[1]

[1]University of Ottawa

1-D-129 ***Visual discrimination between complex objects gates early excitatory oculomotor projections during saccade task***

Devin Kehoe[1], Jennifer Lewis[2], Mazyar Fallah[1]

[1]York University, [2]University of Toronto

1-D-130 ***Task-specific V3 spinal interneuron circuit modules revealed through distinct subpopulation topographies***

Dylan Deska-Gauthier[1]

[1]Dalhousie University

1-D-131 ***Immunohistochemical phenotyping of sensory neurons associated with sympathetic plexuses in the mouse trigeminal ganglia***

Hanin Alsaadi[1], Jacob Peller[1], Nader Ghasemlou[1], Michael Kawaja[1]

[1]Queen's University

1-D-132 ***Insulin-like growth factor-1 augments mitochondrial function through AMPK to drive axonal repair and protect from sensory neuropathy in type 1 diabetes***

Mohamad-Reza Aghanoori[1]

[1]University of Manitoba

1-D-133 ***Endogenous IGF-1 in dorsal root ganglia is expressed by sensory neurons, drives neurite outgrowth and is suppressed in the diabetic state***

Mohamad-Reza Aghanoori[1], Paul Fernyhough[1]

[1]University of Manitoba

1-D-134 ***Lionfish venom elicits pain predominantly through the activation of non-peptidergic nociceptors***

Stephanie Mouchbahani-Constance[1]

[1]McGill University

1-D-135 ***Investigating the neural basis of pain sensitivity in fibromyalgia syndrome using functional magnetic resonance imaging: a pilot study***

Howard Warren[1], Patrick Stroman[1], Jocelyn Powers[1], Gabriela Ioachim[1]

[1]Queen's University

1-D-136 ***Spinal nociceptive projection neurons are defined by Phox2a expression***

Robert Brian Roome[1], Susana Sotocinal[2], Annie Dumouchel[1], Shima Rastegar-Pouyani[1], William Scott Thompson[1], Samuel Ferland[3], Cyril Bories[3], Yves de Koninck[3], Jeff Mogil[2], Marie Kmita[1], Artur Kania[1]

[1]Institut de Recherche Clinique de Montreal (IRCM), [2]McGill University, [3]Université Laval

1-D-137 ***Fast and accurate edge-orientation processing by synaptic integration across the population of first-order tactile neurons***

Etay Hay[1], J Andrew Pruszynski[2]

[1]Krembil Centre for Neuroinformatics, CAMH, [2]University of Western Ontario

1-D-138 ***Investigation of placebo modulation of pain responses in the healthy human brainstem and spinal cord by means of fMRI***

Patrick Stroman[1], Jocelyn Powers[1], Gabriela Ioachim[1], Howard Warren[1]

[1]Queen's University

1-D-139 ***Melanopsin-immunoreactive neurons in the fish retina***

Tareq Yousef[1], William Baldridge[1]

[1]Dalhousie University

1-D-140 ***Intermittent failure of spike propagation in primary afferent neurons***

Dhekra Al-Basha[1], Steven Prescott[2]

[1]The Hospital for Sick Children, [2]University of Toronto

1-D-141 ***Learning and categorization of objects through haptic exploration***

Kyle Gauder[1], Daniel Goldreich[1]

[1]McMaster University

1-D-142 ***Characterization of motor and sensory deficits of a photothrombosis-induced perinatal stroke mouse model***

Sarah Zhang[1], Isabelle Sinclair-Takoff[1], Greg Silasi[1]

[1]University of Ottawa

1-D-143 ***Electrophysiological characterization of hIPSC-derived sensory neurons using a small molecule inhibition protocol reveals a heterogeneous population of neurons***

Lee Lesperance[1], Sazia Sharmin[1], Wei Wei[1], Alina Piekna[1], Deivid Rodrigues[1], James Ellis[1], Steve Prescott[1]

[1]The Hospital for Sick Children

1-D-144 ***Laminar organization of conflict monitoring and goal maintenance signals in the medial frontal cortex***

Amirsaman Sajad[1], Steven Errington[1], Jeffrey Schall[1]

[1]Vanderbilt University

E - Homeostatic and neuroendocrine systems

1-E-145 ***Vasopressin Receptor 1a defines mechano and thermosensitive neurons in rat OVLT.***

Cristian Zaelzer-Perez[1], Charles Bourque[2]

[1]Research Institute of the McGill University Health Centre, [2]McGill University

1-E-146 ***Role of glutamate co-expression in melanin-concentrating hormone neurons in the lateral hypothalamus***

Aditi Sankhe[1], Dillon Bordeleau[1], Diana Alfonso[1], Gabor Wittmann[2], Melissa Chee[1]

[1]Carleton University, [2]Tufts Medical Center

1-E-147 ***Salt loading increases mechanosensitivity (osmosensitivity), and enhances cytoskeletal components within vasopressin neurons of the rat supraoptic nucleus***

Joshua Wyrosdic[1], David Levi[1], Masha Prager-Khoutorsky[1], Charles Bourque[2]

[1]Research Institute of the McGill University Health Centre, [2]McGill University

1-E-148 ***Induction of c-Fos in distinct brain regions following acute treatment with live, but not heat-killed bacteria through vagus nerve-dependent and independent pathways***

Aadil Bharwani[1], Christine West[2], Karen-Anne McVey Neufeld[2], John Bienenstock[2], Paul Forsythe[2]

[1]St. Joseph's Healthcare Hamilton, [2]McMaster University

1-E-149 ***Adipose Triglycerides Lipase (ATGL) in mediobasal hypothalamic neurons plays a key role in energy homeostasis regulation.***

Romane Manceau[1], Sebastien Audet[1], Arturo Machuca Parra[1], Khalil Bouyakdan[1], Alexandre Fisette[1], Demetra Rodaros[1], Grant Mitchell[2], Stephanie Fulton[1], Thierry Alquier[1]

[1]CRCHUM - Université de Montréal, [2]Ste Justine Hospital

1-E-150 ***Disruption of circadian rhythms by shiftwork and effects on alcohol consumption***

Abanoub Aziz Rizk[1], Bryan Jenkins[1], Yasmine Al-Sabagh[1], Cristine Reitz[1], Mina Rasouli[1], Tami Martino[1], Jibran Khokhar[1]

[1]University of Guelph

1-E-151 ***Identifying molecular mechanisms of socially-mediated pubertal suppression***

Mariela Faykoo-Martinez[1], Dustin Sokolowski[1], Zaichao Zhang[1], Kyoko Yuki[2], Troy Collins[1], Mark Palmert[2], Michael Wilson[2], Melissa Holmes[3]

[1]University of Toronto, [2]The Hospital for Sick Children, [3]University of Toronto Mississauga

1-E-152 ***Dinner for two: digging into how ghrelin & endocannabinoid systems regulate feeding in the VTA***

Alexander Edwards[1], Lindsay Hyland[1], Matthew Hill[2], Melissa Chee[1], Alfonso Abizaid[1]

[1]Carleton University, [2]University of Calgary

1-E-153 ***Electrophysiological effects of neurotensin on subfornical organ neurons***

Colleen Peterson[1], Mark Fry[1]

[1]University of Manitoba

1-E-154 ***An in vivo electrophysiology study of neurons in the paraventricular nucleus of the hypothalamus responding to stress***

Aoi Ichiyama[1], Kaela Scott[2], Brian Allman[2], Wataru Inoue[2]

[1]Western University, [2]University of Western Ontario

1-E-155 ***Low dose gestational BPA exposure alters circadian rhythms in mice***

Dinu Nesan[1], Michael Antle[1], Deborah Kurrasch[1]

[1]University of Calgary

F - Cognition and behavior

1-F-156 ***Interaction between a polygenic risk score for fasting insulin and socioemotional development in children***

Aashita Batra[1], Zihan Wang[1], Irina Pokhvisneva[1], Michael Meaney[1], Patricia Silveira[1]

[1]McGill University

1-F-157 ***The key for brain exercises to be effective for cognitive function is its delivery mode***

Zahra Moussavi[1], Cassandra Aldaba[1], Sogol Masoumzadeh[1], Duy Tran[1], Maria Uehara[1], Brian Lithgow[1]

[1]University of Manitoba

1-F-158 ***Atomoxetine prevents working memory loss in hyperactive rats, mediating plastic changes in prefrontal cortex pyramidal neurons***

Néstor Martínez-Torres[1], David González-Tapia[2], Myrna Nallely Vázquez-Hernández[2], Ignacio González-Burgos[2]

[1]Universidad de Guadalajara/ Instituto Mexicano Del Seguro Social, [2]Instituto Mexicano Del Seguro Social

1-F-159 ***Hierarchical architecture of the human brain during external and internal attention***

Julia Kam[1], Jack Lin[2], Anne-Kristin Solbakk[3], Tor Endestad[3], Pål Larsson[4], Robert Knight[1]

[1]University of California, Berkeley, [2]University of California, Irvine, [3]University of Oslo, [4]Oslo University Hospital

1-F-160 ***Polygenic differential susceptibility to adversity and ADHD problems in children: the expression based Insulin-receptor Polygenic Score***

Bruna Regis Razzolini[1], Zihan Wang[1], Irina Pokhvisneva[1], Michael Meaney[1], Patricia Silveira[1]

[1]McGill University

1-F-161 ***Developing a translational polygenetic risk score of differential susceptibility***

Maeson Latsko[1], Zihan Wang[1], Tie Yuan Zhang[1], Michael Meaney[1], Patricia Pelufo Silveira[1]

[1]McGill University

1-F-162 ***The effect of stress-relieving visual cues in health communication and its neurobiological and psychological pathways***

Zhenfeng Ma[1], Andre Portella[2], Laurette Dube[2]

[1]Wilfrid Laurier University, [2]McGill University

1-F-163 ***Red preferentially strengthens response inhibition in a stop signal paradigm where color change occurs at a spatially separated location***

Gifty Asare[1], Saloni Phadke[1], Heather Jordan[1], Mazyar Fallah[1]

[1]York University

1-F-164 ***Association of semantic priming deficits with role functioning in persons at clinical high risk for schizophrenia: Evidence from event-related brain potentials***

Jennifer Lepock[1], Romina Mizrahi[1], Margaret Maheandiran[1], Sarah Ahmed[1], Michelle Korostil[2], R. Michael Bagby[2], Michael Kiang[1]

[1]Centre for Addiction and Mental Health, [2]University of Toronto

1-F-165 ***Lateral habenula output pathways in depression***

Jose Cesar Hernandez Silva[1], Nikola Pausic[2], Christophe Proulx[1]

[1]CERVO Brain Research Centre, [2]CERVO brain research center

1-F-166 ***Prenatal noise stress aggravates cognitive decline and the onset and progression of β-amyloid pathology in a mouse model of Alzheimer's disease***

Zahra Jafari[1], Megan Ocuma[1], Hadil Karem[1], Jogender Mehla[1], Bryan Kolb[1], Majid Mohajerani[1]

[1]Lethbridge University

1-F-167 ***Lactate dehydrogenase expression in Drosophila melanogaster impacts lifespan and long-term courtship memory***

Ariel Frame[1], Anne Simon[1], Robert Cumming[2]

[1]Western University, [2]University of Western Ontario

1-F-168 ***Effects of prenatal stress and/or forebrain atrx deficiency in C57BL/6 male mice on maternal care and emotional, cognitive and social development***

Gloria Rodrigues[1], Kristen Lee[1], Hillary Maillet[1], Donna Goguen[1], Ian Weaver[1]

[1]Dalhousie University

1-F-169 ***Deep learning with segregated dendrites and multiplexing***

Jordan Guerguiev[1], Thomas Mesnard[2], Richard Naud[3], Blake Richards[4]

[1]University of Toronto Scarborough, [2]École Normale Supérieure, [3]University of Ottawa, [4]University of Toronto

1-F-170 ***Changes in resting state neuronal networks and non-verbal learning in children with previous infantile hydrocephalus***

Ikhlas Hashi[1], Estelle Ansermet[1], Roy Eagleson[2], Sandrine de Ribaupierre[1]

[1]University of Western Ontario, [2]Western University

1-F-171 ***CRIPSR/CAS9 mouse model to study glutamate co-transmission by serotonin neurons of the dorsal raphe nucleus***

Lydia Saïdi[1], Christophe Proulx[2], Martin Parent[3]

[1]CERVO Brain Research Center, [2]CERVO Brain Research Centre, [3]Université Laval

1-F-172 ***Development of neurocognitive remediation package for patients with schizophrenia in India: a pilot study***

Garima Joshi[1], Pratap Sharan[1], Kameshwar Prasad[1], Nand Kumar[1], V. Sreenivas[1], Ashima Nehra[1]

[1]All India Institute of Medical Sciences

1-F-173 ***Effects of early-life maternal care received and dopamine receptor-2 genotype on brain dopamine levels and maternal behaviour in female rat offspring***

Hannan Malik[1], Samantha Lauby[1], Diptendu Chatterjee[2], Pauline Pan[1], Alison Fleming[3], Patrick McGowan[4]

[1]University of Toronto Scarborough, [2]SickKids Research Institute, [3]University of Toronto Mississauga, [4]University of Toronto

1-F-174 ***Structural covariance networks among normal, high risk, and cognitively impaired older individuals***

Neda Rashidi-Ranjbar[1], Sanjeev Kumar[2], Benoit Mulsant[2], Nathan Herrmann[3], Linda Mah[4], Alastair Flint[5], Corrine Fischer[6], Bruce Pollock[2], Tarek Rajji[2], Aristotle Voineskos[2], on behalf of the PACt-MD Study Group[2]

[1]University of Toronto, [2]Centre for Addiction and Mental Health, [3]Sunnybrook Health Sciences Centre, [4]Baycrest Health Sciences, Rotman Research Institute, [5]University Health Network, [6]St. Michael's Hospital

1-F-175 ***Evaluation of the nomophobia's prevalence and its impact on school performance among adolescents in Morocco***

Ismail Louragli[1], Ahmed Ahami[1], Abderrazak Khadmaoui[1]

[1]University Ibn Tofail, Kenitra, Morocco

1-F-176 ***Uncovering the physical properties of clitoral stimulation: exploring paint bristle stiffness and conditioned partner avoidance in the female rat***

Marjolaine Rivest-Beauregard[1], Christine Gerson[1], Conall Mac Cionnaith[1], Eamonn Gomez-Perales[1], Uri Shalev[1], James Pfaus[2]

[1]Concordia University, [2]Universidad Veracruzana

1-F-177 ***Response in the avian hippocampal formation to incremental changes in context***

Chelsey Damphousse[1], Noam Miller[1], Diano Marrone[1]

[1]Wilfrid Laurier University

1-F-178 ***The effects of telencephalon lesions on zebrafish social behaviour***

Hailey Katzman[1], Noam Miller[1]

[1]Wilfrid Laurier University

1-F-179 ***Are sung words better recognized than spoken words?***

Agnès Zagala[1], Séverine Samson[2]

[1]International Laboratory for BRAin, Music and Sound Research, [2]Neuropsychology and Audition team Laboratory PSITEC EA 4072

1-F-180 ***Quail-ure: a tale of an animal that can't do anything***

Josephine Esposto[1], Chelsey Damphousse[1]

[1]Wilfrid Laurier University

1-F-181 ***Interactions between medial prefrontal cortex and mediodorsal thalamus are necessary for performance of the odour span task in rats***

Gavin Scott[1], Max Liu[1], Nimra Tahir[1], Nadine Zabder[1], Yuanyi Song[1], Quentin Greba[1], John Howland[1]

[1]University of Saskatchewan

1-F-182 ***Dose dependent acute alcohol exposure affects free swimming behaviour of wild type zebrafish fry***

Benjamin Tsang[1], Rida Ansari[1], Robert Gerlai[1]

[1]University of Toronto

1-F-183 ***Assessment of cognitive performance in Dp(16)1/Yey/+ mouse model of down syndrome***

Negin Rezaie[1], Brian Bennett[1]

[1]Queen's University

1-F-184 ***Acute caffeine exposure on larval zebrafish***

Mahrukh Iqbal[1], Benjamin Tsang[2], Robert Gerlai[2]

[1]UTM, [2]University of Toronto

1-F-185 ***Dissecting the corticothalamic plasticity mechanisms underlying visual recognition memory in mice and humans***

Peter Finnie[1], Aurore Thomazeau[1], Dustin Hayden[1], Lara Pierce[2], Ying Li[3], Maia Lee[3], Ming-fai Fong[1], Charles Nelson[2], Samuel Cooke[4], Mark Bear[1]

[1]Massachusetts Institute of Technology, [2]Boston Children's Hopital/Harvard Medical School, [3]Wellesley College, [4]King's College London

1-F-186 ***Volitional control of individual neurons in the human mesial temporal lobe using intracranial neurofeedback***

Kramay Patel[1], Chaim Katz[1], Ryan Ramos[1], Milos Popovic[2], Taufik Valiante[3]

[1]University of Toronto, [2]University Health Network, [3]Krembil research Institute, University Health Network

1-F-187 ***Development and evaluation of a liposomal formulation of Allium cepa extract for the management of ischemia reperfusion induced cerebral injury in mice***

Varinder Singh[1], Pawan Krishan[2], Richa Shri[2]

[1]Maharaja Agrasen University, [2]Punjabi University, Patiala, Punjab, India

1-F-188 ***Effects of anxiolytic drug buspirone HCl on the behaviour of juvenile zebrafish (Danio rerio)***

Anamika Bhattacharjee[1], Ajandan NandaKumar[1], Robert Gerlai[2]

[1]University of Toronto Mississauga, [2]University of Toronto

1-F-189 ***Deep learning to prove the existence of qualia***

Mahboobeh Parsapoor[1]

[1]McGill University

1-F-190 ***Explore the ameliorative potential of Ficus benjamina in hyperalgesia through the modulation of nitric oxide and KATP channel in mice***

Amrit pal Singh[1]

[1]Guru Nanak Dev University

1-F-191 ***Forming false memories: excitability-dependent incorporation of neutral stimuli into a fear memory.***

Jocelyn Lau[1], Asim Rashid[2], Sheena Josselyn[1]

[1]University of Toronto, [2]The Hospital for Sick Children

1-F-192 ***Silencing a monosynaptic projection from the basolateral amygdala to the ventral hippocampus reduces appetitive and consummatory alcohol drinking behaviors***

Sarah Ewin[1], Jeff Weiner[1]

[1]Wake Forest School of Medicine

1-F-193 ***AdipoRon ameliorates streptozotocin-induced impairment in cognitive impairment and adult hippocampal neurogenesis***

Sonata Yau[1], Thomas Ho Yin Lee[1], Brian R Christie[2]

[1]Hong Kong Polytechnic University, [2]University of Victoria

1-F-194 ***Lateral hypothalamus is a central hub for motivated response***

Ekaterina Martianova[1], Alicia Pageau[1], Danahé LeBlanc[1], Christophe Proulx[2]

[1]Université Laval, [2]CERVO Brain Research Centre

1-F-195 ***Novel negative allosteric modulator (NAM) of Cannabinoid Receptor 1 (CB1) ameliorates symptoms due to dopamine dysregulation in psychiatric disorders.***

Catharine Mielnik[1], Iain Greig[2], Mostafa Abdelrahman[2], Laurent Trembleau[2], Ali Salahpour[1], Amy Ramsey[1], Ruth Ross[1]

[1]University of Toronto, [2]University of Aberdeen

1-F-196 ***Strange human visual perception on physical world veracity***

Tajnin Mohammad Hashim[1], Ganesh Elumalai[1], Anjana Chowdary Elapolu[1], Christina Vadiyala[1], Nanduri Mojess Vamsi[1], Harshita Catherine[1], Nicolas Henrique Ceresoli[1]

[1]Team NeurON - Texila American University

1-F-197 ***Exposure to heroin and heroin paired context enhance consolidation of object memory in rats***

Andrew Huff[1], Michael Wolter[1], Nana Baidoo[1], Boyer Winters[1], Francesco Leri[1]

[1]University of Guelph

1-F-198 ***Cholinergic system involvement in reactivation-induced object memory updating in a newly developed memory modification task***

Kristen Jardine[1], Cassidy Wideman[1], Chelsea MacGregor[1], Krista Mitchnick[1], Boyer Winters[1]

[1]University of Guelph

1-F-199 ***Functional integration of adult-generated granule cells in the avian hippocampal formation***

Diano Marrone[1], Chelsey Damphousse[1]

[1]Wilfrid Laurier University

1-F-200 ***Genome-wide association study (GWAS) of word reading: overlap with risk genes for neurodevelopmental disorders***

Kaitlyn Price[1], Karen Wigg[2], Yu Feng[2], Kirsten Blokland[3], Margaret Wilkinson[3], Gengming He[3], Elizabeth Kerr[3], Tasha-Cate Carter[3], Sharon Guger[3], Maureen Lovett[3], Lisa Strug[3], Cathy Barr[2]

[1]University of Toronto, [2]University Health Network, [3]The Hospital for Sick Children

1-F-201 ***Effects of optogenetic activation of the basolateral amygdala on the response to a reward cue***

Alice Servonnet[1], Giovanni Hernandez[1], Pierre-Paul Rompré[1], Anne-Noël Samaha[1]

[1]Université de Montréal

1-F-202 ***The histone chaperone Anp32E regulates H2A.Z eviction and turnover and regulates memory formation in the hippocampus***

gilda stefanelli[1], Mark Brimble[2], Klotilda Narkaj[1], Anas Reda[3], Andrew Davidoff[2], Brandon Walters[4], Iva Zovkic[1]

[1]University of Toronto Mississauga, [2]St. Jude Research Hospital, [3]Bates college, [4]The Hospital for Sick Children

1-F-203 ***Decreased corticostriatal coherence and locomotion in rats following acute exposure to vapourized delta-9-tetrahydrocannabinol***

Bryan Jenkins[1], Tapia Foute Nelong[1], Sam Creighton[1], Boyer Winters[1], Melissa Perreault[1], Jibran Khokhar[1]

[1]University of Guelph

1-F-204 ***Sex-specific signatures of stress susceptibility in the glutamatergic projections from the ventral hippocampus to nucleus accumbens***

Jessie Muir[1], Rosemary Bagot[1]

[1]McGill University

1-F-205 ***Visualizing an amygdala engram***

Emily Kramer[1], Patrick Steadman[1], Alexander Jacob[1], Albert Park[1], Paul Frankland[1], Sheena Josselyn[1]

[1]University of Toronto

1-F-206 ***Using a novel conflict paradigm to understand the role of the medial temporal lobe in approach-avoidance conflict decision-making and outcome uncertainty***

Sonja Chu[1], Cendri Hutcherson[1], Rutsuko Ito[1], Andy Lee[1]

[1]University of Toronto

1-F-207 ***Combined and sex-specific volumetric variations observed in adults with alcohol and cannabis use disorders: an ENIGMA-Addiction working group meta-analysis***

Xavier Navarri[1], Mohammad Afzali[1], Patricia Conrod[1]

[1]Université de Montréal

1-F-208 ***Ephrins and Eph receptors gene expression regulation and roles in circadian and sleep physiology***

Maria Neus Ballester Roig[1], Lydia Hannou[1], Pierre-Gabriel Roy[1], Erika Bélanger-Nelson[1], Valerie Mongrain[2]

[1]Hôpital du Sacré-Coeur de Montréal, [2]Université de Montréal

1-F-209 ***Altered circadian responses of locomotor activity rhythms in Neuroligin-1 knockout mice***

Maria Neus Ballester Roig[1], Julien Dufort-Gervais[1], Valerie Mongrain[2]

[1]Hôpital du Sacré-Coeur de Montréal, [2]Université de Montréal

1-F-210 ***Spontaneous hippocampal neurogenesis is crucial for memory generalization***

Sang-Yoon Ko[1], Sheena Josselyn[1], Paul Frankland[1]

[1]The Hospital for Sick Children/ University of Toronto

1-F-211 ***Depression and anxiety in PCS patients***

Corinne Doroszkiewicz[1], Charles Tator[1]

[1]University Health Network

G - Novel methods and technology development

1-G-212 ***Predictors of individual variations in corticomotor excitability in response to thermal stimulation***

Yekta Ansari[1], Francois Tremblay[1]

[1]University of Ottawa

1-G-213 ***Silicone photomultiplier and lock-in detection for wireless photometry***

Kenneth Loughery[1], Kathryn Simone[1], Kartikeya Murari[1]

[1]University of Calgary

1-G-214 ***Design of an ultra-fast switching mouse melanopsin variant with a narrow action spectrum***

Raziye Karapinar[1], Dennis Eickelbeck[1], Stefan Tennigkeit[1], Till Rudack[1], Klaus Gerwert[1], Stefan Herlitze[1]

[1]Ruhr-University Bochum

1-G-215 ***An open source automated two-bottle choice test apparatus for rats***

Jude Frie[1], Jibran Khokhar[1]

[1]University of Guelph

1-G-216 ***In situ validation and spatial mapping of diverse striatal cells identified by scRNA-seq in the mouse brain at single-cell resolution***

Jyoti Phatak[1], Han Lu[1], Hailing Zong[1], Li Wang[1], Li-Chong Wang[1], Morgane Rouault[1], Claudia May[1], David Remedios[1], Jonathan Samson[1], Xiao-Jun Ma[1], Courtney Anderson[1]

[1]Advanced Cell Diagnostics, Inc

1-G-217 ***Interactive user interface for exploring BOLD signal variability-derived functional connectivity***

Daiana Pur[1], Roy Eagleson[1], Sandrine de Ribaupierre[2]

[1]Western University, [2]University of Western Ontario

1-G-218 ***Implantable multichannel wireless recording with support for custom electrode configurations for animal electrophysiology***

Jonathan Landes[1], Jessi Mischel[1], Andrew Wilder[1], Brian Crofts[1], Scott Hiatt[1], Daniel McDonnal[1]

[1]Ripple

1-G-219 ***Deep learning for high-throughput quantification of oligodendrocyte ensheathment at single-cell resolution***

Daryan Chitsaz[1], Yu Kang Xu[2], Robert Brown[2], Qiao Ling Cui[2], Jack Antel[2], Timothy Kennedy[1]

[1]McGill University, [2]Montreal Neurological Institute

1-G-220 ***Clarifying dopaminergic projections of the ventra tegmental area and substantia nigra in humans using structural magnetic resonance imaging***

Nicholas Handfield-Jones[1], Erind Alushaj[1], Nole Hiebert[1], Adrian Owen[1], Ali Khan[1], Penny MacDonald[1]

[1]University of Western Ontario

1-G-221 ***In vitro optogenetic stimulation using implantable integrated nanophotonic neural probes***

Fu Der Chen[1], Homeira Moradi Chameh[2], Wesley Sacher[3], Ilan Almog[1], Thomas Lordello[1], Xinyu Liu[3], Michael Chang[2], Azadeh Naderian[2], Tianyuan Xue[1], Sara Mahallati[4], Trevor Fowler[3], Eran Segev[3], Laurent Moreaux[3], Michael Roukes[3], Taufik Valiante[5], Joyce Poon

[1]University of Toronto, [2]Krembil Research Institute, [3]California Institute of Technology, [4]IBBME, University of Toronto, [5]Krembil research Institute, University Health Network

1-G-222 ***Fiber-optic tissue identification for electrode placement in deep brain stimulation neurosurgery***

Damon DePaoli[1], Laurent Goetz[1], Dave Gagnon[1], Nicolas Lapointe[1], Gabriel Maranon[1], Léo Cantin[2], Michel Prud'homme[2], Martin Parent[1], Daniel Côté[1]

[1]Université Laval, [2]Hôpital Enfant Jésus

1-G-223 ***Machine learning-based seizure prevention with closed-loop brain stimulation***

Gerard O'Leary[1], David Groppe[2], Roman Genov[1], Taufik Valiante[3]

[1]University of Toronto, [2]Krembil Neuroscience Center, [3]Krembil research Institute, University Health Network

1-G-224 ***A novel plasma based concussion/traumatic brain injury biomarker for children and adolescents***

Changiz Taghibiglou[1], Sathiya Sekar[1], Hajar Miranzadeh Mahabadi[1], Douglas Fraser[2]

[1]University of Saskatchewan, [2]Western University

1-G-225 ***Revisiting the role of CSF1R in microglia and other tissue-resident macrophages***

Khiet Trong[1], Jye-Lin Hsu[1], Ted Weita Lai[1]

[1]China Medical University

1-G-226 ***An innovative approach to evaluating the disease factors in the management of treatment-resistance (TR) for mood disorder in older adults (MDOA)***

Atul Sunny Luthra[1], Theresa Breen[2], Trevor Semplonius[1], Heather Millman[2], Shannon Remers[2]

[1]McMaster University, [2]Homewood Health Centre

H - History, teaching, public awareness and societal impacts in neuroscience

1-H-227 ***Beyond P.I.E.C.E.S. and GPA: 'Meaning' of behaviors in persons with Dementia (PwD)***

Atul Sunny Luthra[1]

[1]McMaster University

IBRO

1-IBRO-228 ***SiRNA blocking of mammalian target of rapamycin (mTOR) attenuates pathology in annonacin-induced tauopathy in mice***

Khaled Abbas[1], Mohamed Salama[1], Mahmoud El-Hussiny[1], Wael Mohamed[2], Mohamed Sobh[1], Sabry El-khodery[3]

[1]Mansoura University Faculty of Medicine, [2]Kulliyyah of Medicine, International Islamic University, Kuantan, Pahang, Malaysia, [3]Mansoura University Faculty of veterinary Medicine

1-IBRO-229 ***Behavioral alterations and reduced hippocampal neuroplasticity in an animal model of inhalant abuse***

Hanaa Malloul[1], Sara Bonzano[2], Mohammed Bennis[1], Giovanna Gambarotta[2], Silvia De Marchis[2], Saadia Ba-M'hamed[1]

[1]University Cadi Ayyad, Faculty of Sciences Semlalia, [2]University of Turin

1-IBRO-230 ***5-HT2a receptor in prefrontal cortex participates in the resolution of retroactive interference between object memories during consolidation***

Juan Morici[1], Francisco Gallo[1], Magdalena Miranda[1], Pedro Bekinschtein[1], Noelia Weisstaub[1]

[1]Laboratory of Memory Research and Molecular Cognition, Consejo Nacional de Investigaciones Científic

Poster cluster: Alzheimer's disease, vascular dysfunction, treatments and cellular plasticity

1-Cluster-231 ***A time-course analysis of cell proliferation in the brain following blood-brain barrier modulation using focused ultrasound***

Joseph Silburt[1], Kelly Coultes[2], Kullervo Hynynen[1], Isabelle Aubert[2]

[1]University of Toronto, [2]Sunnybrook Research Institute

1-Cluster-232 ***Parameter optimization using Tensorflow in personalized virtual brain models of Parkinson's disease***

Zheng Wang[1], Kelly Shen[1], Tanya Brown[1], Anthony McIntosh[1]

[1]Baycrest

1-Cluster-233 ***Gene immunotherapy in mouse model of Alzheimer's disease***

Zeinab Noroozian[1], Joseph Silburt[1], Kristiana Xhima[1], Maurice Pasternak[2], Dariush Davani[2], Han Su[3], Kagan Kerman[3], JoAnne McLaurin[2], Sebastian Kügler[4], Kullervo Hynynen[1], Isabelle Aubert[2]

[1]University of Toronto, [2]Sunnybrook Research Institute, [3]University of Toronto Scarborough, [4]University Medicine Göttingen

1-Cluster-234 ***Blood-brain barrier modulation in the basal forebrain with focused ultrasound enhances delivery of a nerve growth factor mimetic in a mouse model of Alzheimer's disease***

Kristiana Xhima[1], Kelly Markham-Coultes[2], Hinyu Nedev[3], H. Uri Saragovi[3], Kullervo Hynynen[1], Isabelle Aubert[2]

[1]University of Toronto, [2]Sunnybrook Research Institute, [3]McGill University

1-Cluster-235 ***A developmentally-induced cell stress response in TSC2-/- NSCs drives brain-specific disease phenotypes and therapeutic vulnerabilities in Tuberous Sclerosis Complex***

Lisa Julian[1], Sean Delaney[1], Carole Dore[1], Julian Yockell-Lelievre[1], Adam Pietrobon[1], William Stanford[1]

[1]Ottawa Hospital Research Institute

1-Cluster-236 ***BrainReach/Mission Cerveau: An innovative way to bring neuroscience to the community***

Eviatar Fields[1], Marie-Julie Allard[2], Samuel Guay[2]

[1]McGill University, [2]on behalf of BrainReach/Mission Cerveau at McGill University

Poster cluster: Lipid signalling in the developing brain: link to autism

1-Cluster-237*Misoprostol alters the migration and differentiation of neuroectodermal stem cells*

Denis Adigamov[1], Dorota Crawford[1]

[1]York University

1-Cluster-238*Prostaglandin E2 affects the expression of neuronal hemoglobin- link to autism spectrum disorders*

Isabel Bestard-Lorigados[1], Ravneet Rai-Bhogal[1], Christine Wong[1], Dorota Crawford[1]

[1]York University

1-Cluster-239*Microglia activity in the mouse brain lacking prostaglandin E2 producing enzyme cyclooxygenase 2- connection to autism*

Sarah Wheeler[1], Ravneet Rai-Bhogal[1], Dorota Crawford[1]

[1]York University

1-Cluster-240*Prenatal exposure to Prostaglandin E2 leads to abnormal cell density and migration in the mouse brain - link to Autism*

Christine Wong[1], Isabel Bestard Lorigados[1], Dorota Crawford[1]

[1]York University

1-Cluster-243 Focused ultrasound mediated IVIg immunotherapy in the hippocampus enhances the proliferation of neural progenitor cells in a mouse model of amyloidosis

Sonam Dubey[1], Maurice Pasternak[1], JoAnne McLaurin[1], Donald Branch[2], Kullervo Hynynen[3], Isabelle Aubert[1]

[1]Sunnybrook Research Institute, [2]Canadian Blood Services, [3]University of Toronto

1-Cluster-244 Cerebrovascular dysfunction in a mouse model of Alzheimer's disease

Madelaine Lynch[1], Lynsie A.M. Thomason[1], Rafal Janik[1], Illsung Lewis Joo[1], Bojana Stefanovic[1], Isabelle Aubert[1]

[1]Sunnybrook Research Institute

1-B-241 ***Deep learning-based analysis of optical nanoscopy images reveals activity-dependent reorganization of the periodical actin lattice in dendrites***

Flavie Lavoie-Cardinal[1], Anthony Bilodeau[1], Mado Lemieux[2], Marc-André Gardner[2], Theresa Wiesner[1], Gabrielle Laramée[1], Christian Gagné[1], Paul De Koninck[2]

[1]CERVO Brain Research Center, [2]Université Laval

1-A-242 ***Effects of elevated prenatal testosterone and prenatal dexamethasone on hormone profiles and stress responsivity in mice***

Hayley Wilson[1], Emily Martin[1], Elena Choleris[1], Neil MacLusky[1]

[1]University of Guelph

Session 2 – Friday, May 24

Sponsored by **University of Ottawa Brain and Mind Research Institute**

A – Development

2-A-1 ***Mechanisms controlling neural stem cell quiescence***

Danielle Jeong[1], Archana Gengatharan[2], Armen Saghatelyan[3], David Kaplan[4], Freda Miller[4], Scott Yuzwa[1]

[1]University of Toronto, [2]Centre de Recherche de l'Institut Universitaire en Santé Metale de Québec, [3]Université Laval, [4]The Hospital for Sick Children

2-A-2 ***The proteomic architecture of human fetal neural progenitor cells***

Jennifer Kao[1], Ugljesa Djuric[2], Mike Papioannou[2], Ihor Batruch[3], Patrick Shannon[3], Phedias Diamandis[1]

[1]University of Toronto, [2]University Health Network, [3]Mount Sinai Hospital

2-A-3 ***The role of endocannabinoid signaling during spinal cord regeneration in Ambystoma mexicanum***

Michael Tolentino[1], Gaynor Spencer[1], Robert Carlone[1]

[1]Brock University

2-A-4 ***Effects of early-life stress on AMPA receptors in the auditory cortex***

Carinna Moyes[1], Aycheh Al-Chami[1], Hongyu Sun[1]

[1]Carleton University

2-A-5 ***npat regulates the retinal progenitor cell population and replication dependent histone transcript synthesis in postembryonic zebrafish***

Monica Dixon[1], Michael Mattocks[1], Maria Sartori[1], Jason Willer[2], Ronald Gregg[2], Vince Tropepe[1]

[1]University of Toronto, [2]University of Louisville

2-A-6 ***The elucidation of neuronal cell fate specification from cortical neural stem cells using single cell transcriptional profiling***

Michael Borrett[1], Mekayla Storer[2], David Kaplan[2], Freda Miller[2]

[1]University of Toronto, [2]The Hospital for Sick Children

2-A-7 ***Ehmt1/GLP protein expression is enhanced in newborn and migrating cells of neurogenesis areas in mouse and rat brain***

Catharina Van der Zee[1], Hans van Bokhoven[1]

[1]Radboudumc

2-A-8 ***Changes in microRNA localization during growth cone guidance***

Sarah Walker[1], Robert Carlone[1], Gaynor Spencer[1]

[1]Brock University

2-A-9 ***A gradient of netrin-1 directs commissural axon extension in the embryonic spinal cord***

Celina Cheung[1], Karen Lai Wing Sun[1], Stephanie Harris[1], Reesha Raja[1], Daryan Chitsaz[1], Jean-Francois Cloutier[1], Timothy Kennedy[1]

[1]McGill University

2-A-10 ***Effects of Val66Met BDNF polymorphism on cortical GABAergic circuit refinement***

Pegah Chehrazi[1], Graziella Di Cristo[1]

[1]Université de Montréal

2-A-11 ***Perinatal high fat diet alters maternal milk miRNA expression and programs the DNA methylome in the amygdala.***

Sanoji Wijenayake[1], Sameera Abuaish[1], Wilfred de Vega[1], Christine Lum[1], Aya Sasaki[1], Patrick McGowan[2]

[1]University of Toronto, Scarborough, [2]University of Toronto

2-A-12 ***A literature curated resource of experimentally tested gene regulatory relationships relevant to brain development***

Eric Chu[1], Alexander Morin[1], Tak HC Chang[1], Aman Sharma[1], Chao Chun Liu[1], Tue Nguyen[1], Paul Pavlidis[1]

[1]University of British Columbia

2-A-13 ***A role for Rho GTPases in retinoic acid-induced growth cone guidance***

Alysha Johnson[1], Gaynor Spencer[1]

[1]Brock University

2-A-14 ***A time course for cell maturation in the adult naked mole-rat brain***

Troy Collins[1], Mariela Faykoo-Martinez[1], Arthur Cheng[2], Christopher Lowden[2], Hai-Ying Cheng[2], Melissa Holmes[2]

[1]University of Toronto, [2]University of Toronto Mississauga

2-A-15 ***The effects of neuronal nitric oxide synthase and apoptosis on neural stem cell proliferation within the adult enteric nervous system***

Catherine Parisien[1], Alan Lomax[1]

[1]Queen's University

2-A-16 ***Shedding light on topographic map formation with GCaMP-expressing Xenopus tadpoles***

Vanessa Li[1], Anne Schohl[1], Edward Ruthazer[1]

[1]McGill University

2-A-17 ***Abnormal social communication in infant IgSF21 mutant mice***

Nicole Pickett[1], Ryan Wheeler[1], Yusuke Naito[2], Hideto Takahashi[2], Tamara Franklin[1]

[1]Dalhousie University, [2]McGill University

2-A-18 ***Regulation of oligodendroglial proliferation and differentiation by NAD+-dependent deacetylase Sirtuin 2***

Kendra Furber[1], Merlin Thangaraj[1], Katie Ovens[1], Shaoping Ji[2], Martin Larsen[3], Adil Nazarali[1]

[1]University of Saskatchewan, [2]Henan University, [3]University of Southern Denmark

2-A-19 ***A fetal fMRI study investigating the activation of the developing primary auditory cortex***

Estee Goldberg[1], Charles McKenzie[1], Barbra de Vrijer[1], Roy Eagleson[1], Sandrine de Ribaupierre[1]

[1]Western University

B - Neural excitability, synapses, and glia: Cellular mechanisms

2-B-20 ***Spike initiation properties of pyramidal neuron axons revealed by channelrhodopsin-based photostimulation***

Mohammad Amin Kamaleddin[1], Stéphanie Ratté[1], Steven Prescott[2]

[1]University of Toronto; The Hospital for Sick Children, [2]University of Toronto

2-B-21 ***Single cell eukaryote Salpingoeca rosetta communicate using neuron-like action potential spikes within rosette colonies involving Nav2 sodium and Cav1 calcium channels***

Jack Moffat[1], Prashanth Velayudhan[1], Amrit Mehta[1], Vu Son Luong[1], Noor Helwa[1], Reza Ramezan[1], Paul Marriott[1], J David Spafford[1]

[1]University of Waterloo

2-B-22 ***Ion channel correlations emerge from the homeostatic regulation of multiple neuronal properties***

Jane Yang[1], Steven Prescott[1]

[1]University of Toronto

2-B-23 ***CRISPR-based approaches to explore interplay between the primate-specific long noncoding RNA LINC00473 and CREB***

Brandon S. Smith[1], Kirill Zaslavsky[2], James Ellis[2], P. Joel Ross[1]

[1]University of Prince Edward Island, [2]The Hospital for Sick Children

2-B-24 ***Role of an aromatic-aromatic interaction in the assembly and trafficking of the zebrafish panx1a membrane channel***

Ksenia Timonina[1], Anna Kotova[1], Christiane Zoidl[1], Georg Zoidl[1]

[1]York University

2-B-25 ***Synaptic activity-dependent changes in the hippocampal palmitoyl-proteome***

Nusrat Matin[1], Glory Nasseri[1], Kyung-Mee Moon[1], Greg Stacey[1], Leonard Foster[1], Shernaz Bamji[1]

[1]University of British Columbia

2-B-26 ***Schizophrenia related protein Fxr1 controls homeostatic tuning of synaptic strength***

Jivan Khlghatyan[1], Alesya Evstratova[2], Simon Chamberland[3], Aleksandra Marakhovskaia[2], Tiago Soares Silva[2], Katalin Toth[1], Valerie Mongrain[4], Jean-Martin Beaulieu[2]

[1]Université Laval, [2]University of Toronto, [3]New York University, [4]Université de Montréal

2-B-27 ***Investigating interneuron subtype-specific inhibitory spike-timing dependent plasticity in the primary motor cortex.***

Xinyi Liang[1], Jessica Pressey[1], Melanie Woodin[1]

[1]University of Toronto

2-B-28 ***The stability of glutamatergic synapses is independent of activity level, but predicted by synapse size***

Dylan Quinn[1], Sydney Harris[1], Michael Wigerius[1], Annette Kolar[1], James Fawcett[1], Stefan Krueger[1]

[1]Dalhousie University

2-B-29 ***L-type voltage gated calcium channels are necessary to induce mGluR dependent long term depression and this role is chronically altered following early life seizures***

Paul Bernard[1], Anna Castano[2], Timothy Benke[2]

[1]Atlantic Veterinary College, University of Prince Edward Island, [2]University of Colorado

2-B-30 ***Modeling myelin plasticity and its mechanisms of oscillatory brain synchronization***

Seong Hyun Park[1]

[1]University of Toronto

2-B-31 ***Measurement and state-dependent modulation of the excitability of a brainstem motoneuron pool in-vivo***

Jasmin Aggarwal[1], Wen-Ying Liu[2], Gaspard Montandon[3], Hattie Liu[1], Richard Horner[1]

[1]University of Toronto, [2]Fudan University, [3]St. Michael's Hospital

2-B-32 ***Microcircuitry of the cortex: connectivity, strength, and short-term plasticity***

Tim Jarsky[1], Luke Campagnola[1], Stephanie Seeman[1], Alex Hoggarth[1], Lisa Kim[1], Travis Hage[1], Pasha Davoudian[1], Gabe Murphy[1], Christof Koch[1], Hongkui Zeng[1], Christopher Baker[1], Corinne Teeter[1], Stephan Mihalas[1], Jung Hoon Lee[1]

[1]Allen Institute for Brain Science

2-B-33 ***Phylogenetic assessment of protein interactions between pre-synaptic CaV2 calcium channels and the scaffolding protein RIM***

Alicia Harracksingh[1], Abdul Rahman Taha[1], Adriano Senatore[1]

[1]University of Toronto Mississauga

2-B-34 ***Impaired tuning of afferent excitatory synapses of hippocampal fast-spiking interneurons by acute early life seizures***

Ting Ting Wang[1], Hongyu Sun[1]

[1]Carleton University

2-B-35 ***Cannabidiol elevates the ratio of feedforward:feedback inhibition to dampen hippocampal activity propagation***

Simon Chamberland[1], Erica Nebet[1], Evan Rosenberg[1], Orrin Devinsky[1], Richard Tsien[1]

[1]New York University

2-B-36 ***Long term depression induced by group I metabotropic glutamate receptors: the role of probability of release***

Thomas Sanderson[1], John Georgiou[1], Graham Collingridge[2]

[1]Mount Sinai Hospital, [2]University of Toronto

2-B-37 ***Characterisation of the Autism Spectrum-related protein, PTCHD1***

Connie Xie[1], Paul Hamel[1]

[1]University of Toronto

2-B-38 ***Exploring the molecular and phenotypic properties of voltage gated calcium channels in Trichoplax adhaerens, an animal without synapses***

Julia Gauberg[1], Sally Abdallah[2], Adriano Senatore[1]

[1]University of Toronto Mississauga, [2]University of Toronto

2-B-39 ***Role of insulin and pharmacological regulation of intraocular pressure on retinal ganglion cell dendrite regeneration in glaucoma***

Sana El Hajji[1], Nicolas Belforte[1], Heberto Quintero[2], Adriana Di Polo[2]

[1]Université de Montreal, [2]University of Montreal Hospital Research Center

2-B-40 ***Does spatial learning change synaptic expression of the insulin receptor?***

Saeideh Davari[1], Alyssa Guerra[1], John Mielke[1]

[1]University of Waterloo

2-B-41 ***Alternative splicing of the Nav1.5 voltage-gated sodium channel alters channel activation via two amino acid residues***

Adamo Mancino[1], Yuhao Yan[1], Mark RP Aurousseau[1], Derek Bowie[1]

[1]McGill University

2-B-42 ***Contribution of novelty, blood metabolites and blood-brain barrier transport on extracellular brain glucose and lactate fluctuations during motor behavior***

Alexandria Beland[1], Caleb Routledge[1], Devon Frayne[1], Claude Messier[1]

[1]University of Ottawa

2-B-43 ***Developmentally-regulated muscarinic receptor function in layer VI of the medial prefrontal cortex***

Ashutosh Patel[1], Myles St-Denis[1], Sierra Codeluppi[1], Craig Bailey[1]

[1]University of Guelph

2-B-44 ***Voltage-sensor domains contribute unequally to sodium channel activation and inactivation***

Yuhao Yan[1], Adamo Mancino[1], Niklas Brake[1], Takushi Shimomura[2], Yoshihiro Kubo[2], Anmar Khadra[1], Derek Bowie[1]

[1]McGill University, [2]National Institute for Physiological Sciences

2-B-45 ***Alpha5 nicotinic receptors in the prefrontal cortex: built to resist?***

Sridevi Venkatesan[1], Tianhui Chen[1], Yupeng Liu[1], Evelyn Lambe[1]

[1]University of Toronto

2-B-46 ***Nitric oxide production from inducible nitric oxide synthase inhibits microglia proliferation via TRPV2-mediated calcium influx***

Matthew Maksoud[1], Vasiliki Tellios[1], Wei-Yang Lu[1]

[1]University of Western Ontario

2-B-47 ***Bergmann glia morphology and GLAST expression is downregulated in nNOS-/- mice***

Vasiliki Tellios[1], Matthew Maksoud[1], Wei-Yang Lu[1]

[1]University of Western Ontario

2-B-48 ***Inhibition of neuronal electrical excitability by a common flame retardant***

Anjelica Bodnaryk[1], Colleen Peterson[1], Tammy Ivanco[1], Gregg Tomy[1], Mark Fry[1]

[1]University of Manitoba

2-B-49 ***The effects of peripheral inflammation on seizure predisposition in a freeze-lesion model of focal cortical dysplasia***

Tarek Shaker[1], Bidisha Chattopadhyaya[2], Abdul-Rahman El-Hassan[2], Graziella Di Cristo[1], Lionel Carmant[1], Bénédicte Amilhon[1], Alexander Weil[1]

[1]Université de Montréal, [2]CHU Sainte-Justine Research Center/Université de Montréal

2-B-50 ***The role of hypocretin neurons in social stress***

Derya Sargin[1], Jaideep Bains[1]

[1]Hotchkiss Brain Institute

2-B-51 ***Neurons and astrocytes control local brain blood flow on distinct timescales***

Adam Institoris[1], Cam Ha Tran[2], David Rosenegger[1], Govind Peringod[1], Grant Gordon[3]

[1]Hotchkiss Brain Institute, [2]Reno School of Medicine, University of Nevada, [3]University of Calgary

2-B-52 ***The projection targets of medium spiny neurons govern cocaine-evoked synaptic plasticity in the nucleus accumbens***

Corey Baimel[1], Laura McGarry[1], Adam Carter[1]

[1]New York University

2-B-53 ***Intrinsic plasticity as a neural correlate for stress habituation***

Sara Matovic[1], Aoi Ichiyama[2], Hiroyuki Igarashi[3], Xue Fang Wang[4], Eric Salter[5], Mathilde Henry[6], Nathalie Vernoux[7], Marie-Eve Tremblay[7], Wataru Inoue[3]

[1]Robarts Research Institute, [2]Western University, [3]University of Western Ontario, [4]Robarts Research Institute, University of Toronto, [5]University of Toronto, [6]Université Laval, Université de Bordeaux (current), [7]Université Laval

2-B-54 ***Impact of Chrna5 deletion on habenulopeduncular neurotransmission***

Sanghavy Sivakumaran[1], Yupeng Liu[1], Tianhui Chen[1], Daniel Sparks[1], Evelyn Lambe[1]

[1]University of Toronto

2-B-55 ***Cerebellar stellate cell excitability is coordinated by shifts in the gating behavior of voltage-gated Na+ and A-type K+ channels***

Ryan Alexander[1], John Mitry[1], Vasu Sareen[1], Anmar Khadra[1], Derek Bowie[1]

[1]McGill University

2-B-56 ***Diverse topography of voltage-gated Ca2+ channel clusters in distinct morphological modules of a central nerve terminal***

Adam Fekete[1], Yukihiro Nakamura[2], Yi-Mei Yang[3], Stefan Herlitze[4], Melanie D. Mark[4], David DiGregorio[5], Lu-Yang Wang[1]

[1]The Hospital for Sick Children, [2]Department of Pharmacology, Jikei University School of Medicine, [3]University of Minnesota, [4]Ruhr-University Bochum, [5]Unit of Dynamic Neuronal Imaging, Institut Pasteur

2-B-57 ***Deletion of complement cascade components C3 or Cd11b does not impact synapse strength or plasticity at schaffer collateral-CA1 synapses***

Eric Salter[1], Sun-Lim Choi[2], Liam Ralph[2], Gang Lei[2], Junhui Wang[2], Graham Collingridge[1]

[1]University of Toronto, [2]Lunenfeld-Tanenbaum Research Institute

2-B-58 ***Mechanisms of PTPσ-mediated presynaptic differentiation***

Claire Bomkamp[1], Nirmala Padmanabhan[2], Benyamin Karimi[2], Jesse Chao[1], Christopher Loewen[1], Tabrez Siddiqui[2], Ann Marie Craig[1]

[1]University of British Columbia, [2]University of Manitoba

2-B-59 ***Effect of ATRX inactivation on hippocampal synaptic plasticity in mice***

Radu Gugustea[1], Renee Tamming[1], Stan Leung[1], Nathalie Berube[1]

[1]The University of Western Ontario

2-B-60 ***Glutamatergic synapse maintenance, Rab10 phosphorylation, and effects of LRRK2 kinase inhibition in a VPS35 D620N knock-in mouse model of Parkinson's disease***

Chelsie Kadgien[1], Anusha Kamesh[2], Anouar Khayachi[3], Matthew Farrer[4], Austen Milnerwood[3]

[1]Montreal Neurological Institute, McGill and UBC, [2]Montreal Neurological Institute, McGill, [3]Montreal Neurological Institute, [4]UBC

C - Disorders of the nervous system

2-C-61 ***Identification of shared protein interaction networks between high-risk Autism genes through proximity-based proteomics***

Nadeem Murtaza[1], Chad Brown[1], Annie Cheng[1], Brianna Unda[1], Jarryll Uy[1], Vivian Vuong[1], Eric Deneault[2], Kanwal Singh[1], Yu Lu[1], James Ellis[3], Stephen Scherer[3], Brad Doble[1], Karun Singh[1]

[1]McMaster University, [2]University of Toronto, [3]The Hospital for Sick Children

2-C-62 ***Decreased expression of MANF leads to motor dysfunction and alters ER stress pathways: MANF's role in Parkinson's disease pathophysiology***

Ashley Bernardo[1], Omar Shawaf[1], Khaled Nawar[1], Ram Mishra[1]

[1]McMaster University

2-C-63 ***The FDA-approved anti-cancer drug, nilotinib improves astroglials bioenergetics in Alzheimer's disease***

Aida Adlimoghaddam[1], Raymond Scott Turner[2], Benedict Albensi[3]

[1]St. Boniface Hospital Research Centre, [2]Neurol., Georgetown Univ., Washington, DC, [3]University of Manitoba. St. Boniface Hospital Research Centre

2-C-64 ***Excitatory and inhibitory currents underlying cross frequency coupling features during seizure-like event state transitions***

Vanessa Breton[1], Berj Bardakjian[2], Peter Carlen[1]

[1]Krembil Research Institute, [2]University of Toronto

2-C-65 ***Down-regulation of the potassium chloride co-transporter KCC2 in various animal models of Alzheimer's disease***

Iason Keramidis[1], Jogender Mehla[2], Antoine Godin[1], Majid Mohajerani[2], Yves de Koninck[1]

[1]Université Laval, [2]Lethbridge University

2-C-66 ***Investigating the role of the high-risk Autism-associated gene SCN2A using human iPSC-derived neurons***

Elyse Rosa[1], Chad Brown[1], Sean White[1], Vickie Kwan[1], Eric Deneault[2], Biren Dave[1], Yu Lu[1], James Ellis[3], Stephen Scherer[3], Bradley Doble[1], Karun Singh[1]

[1]McMaster University, [2]University of Toronto, [3]The Hospital for Sick Children

2-C-67 ***Striatal chloride homeostasis and inhibitory synaptic transmission is altered in huntington's disease***

Melissa Serranilla[1], Kelly Chen[1], Jessica Pressey[1], Melanie Woodin[1]

[1]University of Toronto

2-C-68 ***Computational modelling indicates irregularity in alpha-helical angular orientation among aggregatory Parkinsonian variants of a-synuclein***

Alexander Ille[1], Hannah Lamont[1], Jeremiah Davie[1], Stacy Ruvio[1], Mathias Moise[2], Stacy Ruvio[1], Raoul Bodea[3]

[1]D'Youville College, [2]University of Waterloo, [3]STEM Biomedical

2-C-69 ***Expression of Na+/K+-ATPase isoforms in higher and lower brain regions following focal ischemia in mice***

Chloe Lowry[1], Brian Bennett[1], R. David Andrew[1]

[1]Queen's University

2-C-70 ***Aging mice show motor deterioration and Purkinje cell firing alterations***

Eviatar Fields[1], Alanna Watt[1]

[1]McGill University

2-C-71 ***Role of IL-1beta in inflammation-mediated disruption of neural circuit development***

Cynthia Solek[1], Nasr A Farooqi[2], Philip Kesner[2], Jack Antel[3], Edward Ruthazer[4]

[1]Montreal Neurological Institute and Hospital, McGill University, [2]Montreal Neurological Institute and Hospital, McGill University, [3]Montreal Neurological Institute, [4]McGill University

2-C-72 ***Inferring white matter structure from correlations in neural population activity***

Rabiya Noori[1], Jeremie Lefebvre[2]

[1]University of Toronto, [2]Krembil Research Institute, University Health Network

2-C-73 ***Lewy pathology in the REM sleep circuit triggers REM sleep behavior disorder in mice***

Russell Luke[1], Jimmy Fraigne[1], Andrea Bevan[1], John Peever[1]

[1]University of Toronto

2-C-74 ***Assessing the role of amyloid precursor protein phosphorylation by polo-like kinase 2 in Alzheimer's disease***

Laura Martínez-Drudis[1], Razan Sheta[1], Laurence Labbé[1], Abid Oueslati[1]

[1]Université Laval & CHU de Québec Research Center, Neuroscience Axis

2-C-75 ***Changes in neurite orientation dispersion and density following mild traumatic brain injury in mice***

Tong Wang[1], Lisa Gazdzinski[1], Miranda Mellerup[1], John Sled[1], Brian Nieman[1], Anne Wheeler[1]

[1]The Hospital for Sick Children

2-C-76 ***Characterization of somatic mutations in mTOR pathway genes in focal cortical dysplasias***

Eric Krochmalnek[1], Andrea Accogli[2], Judith St-Onge[1], Nassima Addour[1], Roy Dudley[3], Ken Myers[2], François Dubeau[3], Jason Karamchandani[2], Jean-Pierre Farmer[3], Jeffrey Atkinson[3], Jeffrey Hall[3], Chantal Poulin[2], Bernard Rosenblatt[2], Joël Lafond Lapalme[1], Steffen Albrecht[2], Jean-Baptiste Rivière[1], Myriam Srour[2]

[1]The McGill University Health Centre Research Institute, [2]McGill University, [3]Montreal Neurological Institute and Hospital

2-C-77 ***Bistability as an underpinning of seizure initiation in simulated inhibitory networks***

Scott Rich[1], Homeira Chameh[1], Marjan Rafiee[1], Katie Ferguson[1], Frances Skinner[1], Taufik Valiante[2]

[1]Krembil Research Institute, [2]Krembil research Institute, University Health Network

2-C-78 ***Expression of IGF-1 and IGF-1 receptor in human idiopathic autism***

Milena Cioana[1], Bernadeta Michalski[1], Margaret Fahnestock[1]

[1]McMaster University

2-C-79 ***Novel brain-behaviour similarity subgroups across neurodevelopmental disorders***

Grace Jacobs[1], Aristotle Voineskos[2], Natalie Forde[3], Erin Dickie[2], Meng-Chuan Lai[1], Peter Szatmari[1], Russell Schachar[1], Jennifer Crosbie[1], Paul Arnold[1], Margot Taylor[1], Anna Goldenberg[1], Lauren Erdman[1], Jason Lerch[1], Evdokia Anagnostou[1], Stephanie Ameis[1]

[1]University of Toronto, [2]Centre for Addiction and Mental Health, [3]Centre for Addition and Mental Health

2-C-80 ***Mitochondria transport deficits and reduced expression of mitochondrial trafficking proteins in retinal ganglion cells***

Heberto Quintero[1], Nicolas Belforte[2], Adriana Di Polo[1]

[1]University of Montreal Hospital Research Center, [2]Université de Montreal

2-C-81 ***Rostromedial tegmental activation in a preclinical model of depression-addiction comorbidity***

Tristian Critch[1], Bradley Furlong[1], Nageeb Hasan[1], Shannon Waye[1], Josh Conway[1], Francis Bambico[1]

[1]Memorial University of Newfoundland

2-C-82 ***Antidepressant effects of transcranial direct current stimulation (tDCS) and adjunct paroxetine treatment in adolescent rats***

Shannon Waye[1], Francis Bambico[1]

[1]Memorial University of Newfoundland

2-C-83 ***Insulin growth factor-1, unlike insulin, does not promote retinal ganglion cell dendrite regeneration after axonal injury***

Sara Vucetic[1], Jessica Agostinone[1], Adriana Di Polo[2]

[1]University of Montreal, [2]University of Montreal Hospital Research Center

2-C-84 ***The retrograde transport of BDNF and proNGF diminishes with age in basal forebrain cholinergic neurons***

Arman Shekari[1], Margaret Fahnestock[1]

[1]McMaster University

2-C-85 ***Amyloid toxicity or chronic cerebral hypoperfusion on the brain insulin resistance in a rat model with intracerebroventricular streptozotocin***

Hahn Young Kim[1], Bo-Ryoung Choi[1], Ju Ha Seo[1], Dong Bin Back[1]

[1]Konkuk University Hospital

2-C-86 ***The dynamics of TAR DNA-binding protein 43 in stress granules and its role in amyotrophic lateral sclerosis***

Ashley Bo Zhang[1], Shangxi Xiao[1], Philip McGoldrick[1], Janice Robertson[1]

[1]University of Toronto

2-C-87 ***The prion protein is embedded in a molecular environment that modulates transforming growth factor β and integrin signaling***

Farinaz Ghodrati[1], Mohadeseh Mehrabian[1], Declan Williams[1], Ondrej Halgas[1], Matthew E. C. Bourkas[1], Joel C. Watts[1], Emil F. Pai[1], Gerold Schmitt-Ulms[1]

[1]University of Toronto

2-C-88 ***Neuroprotective effect of sigma-1 receptor on synaptic function & calcium handling in Huntington disease***

Wissam Nassrallah[1], James Mackay[1], Amy Smith-Dijak[1], Lynn Raymond[1]

[1]University of British Columbia

2-C-89 ***Attenuation of cytotoxic edema by minocycline***

Anne-Sophie Sack[1], John Tyson[1], Hyun Choi[1], Nicholas Weilinger[1], Brian MacVicar[1], Terrance Snutch[1]

[1]University of British Columbia

2-C-90 ***Investigation of the role of MATR3 in cryptic splicing***

Xiao Xiao (Lily) Chen[1], Hari Krishna Yalamanchili[2], Rebekah van Bruggen[3], Zhandong Liu[4], Jeehye Park[5]

[1]University of Toronto, Sickkids Research Institute, [2]Baylor College of Medicine, [3]University of Toronto, [4]Jan and Dan Duncan Neurological Research Institute at Texas Children's Hospital, [5]The Hospital for Sick Children

2-C-91 ***Variations in the expression of a gene network coexpressed with syntaxyn1a in rodents interacts with early life trauma in determining susceptibility/resilience to depression in humans***

Carla Dalmaz[1], Irina Pokhvisneva[2], Ana Toniazzo[1], Danusa Arcego[2], Kieran O'Donnell[2], Michael Meaney[2], Patricia Silveira[2]

[1]Universidade Federal do Rio Grande do Sul, [2]McGill University

2-C-92 ***Downregulation of molecules involved in inhibitory neurotransmission in a NHE6 knock-out model of Christianson Syndrome***

Andy Gao[1], Louis-Charles Masson[1], Talia James[1], Anne McKinney[1]

[1]McGill University

2-C-93 ***Investigating how ALS-linked mutations in MATR3 cause neurodegeneration***

Ching Kao[1], Rebekah van Bruggen[2], Claudia Arndt[1], Jeehye Park[3]

[1]Peter Gilgan Centre for Research and Learning, [2]University of Toronto, [3]The Hospital for Sick Children

2-C-94 ***Differential expression meta-analyses of genes identified in genome-wide association studies of depression***

Wennie Wu[1], Etienne Sibille[1], Leon French[1]

[1]Centre for Addiction and Mental Health

2-C-95 ***Acting at a distance: Medulloblastoma secreted ligands disrupt normal neural stem cell function***

Alexander Gont[1], Jaclin Simonetta[1], Jenna Park[1], Alice Shan[1], Freda Miller[1], David Kaplan[1]

[1]The Hospital for Sick Children

2-C-96 ***Molecular adaptations of the blood-brain barrier promoting depression and stress resilience***

Katarzyna Anna Dudek[1], Laurence Dion-Albert[1], Manon lebel[1], Katherine Le Clair[2], Ellen Tuck[1], Carmen Ferrer Perez[3], Sam A. Golden[4], Naguid Mechawar[5], Scott J Russo[2], Caroline Menard[1]

[1]CERVO Brain Research Centre, [2]Icahn School of Medicine at Mount Sinai, [3]University of Valencia, [4]University of Washington, [5]McGill University

2-C-97 ***Assessment of cerebrovascular proteins involved in amyloid-β disposition in a mouse model of sporadic Alzheimer's disease***

Kaitlyn Tresidder[1], Brian Bennett[1]

[1]Queen's University

2-C-98 ***Exercise and 4-AP work as an effective combination therapy in a mouse model of spinocerebellar ataxia type 6***

Anna Cook[1], Sriram Jayabal[2], Kristen Vieira-Lomasney[1], Alanna Watt[1]

[1]McGill University, [2]Stanford University

2-C-99 ***Numb prevents neurodegeneration by regulating intraneuronal Tau levels in an isoform-specific manner***

Marine Lacomme[1], Katarina Stevanovic[1], Therence Bois[1], Jenny Cai[1], Michel Cayouette[1]

[1]Institut de Recherche Clinique de Montreal (IRCM)

2-C-100 ***Driving the nuclear accumulation of endogenous alpha-synuclein to model Parkinson's disease in mice***

Haley Geertsma[1], Steve Callaghan[1], Maxime Rousseaux[1]

[1]University of Ottawa

2-C-101 ***Identifying candidate ALS-risk genes through high content screening for TDP-43 mislocalization.***

Terry Suk[1], Emily MacInnis[1], Jean-Louis Parmasad[1], Steve Callaghan[1], Stephen Baird[2], Maxime Rousseaux[1]

[1]University of Ottawa, [2]Childrens Hospital of Eastern Ontario Research Institute

2-C-102 ***Promoting endogenous photoreceptor regeneration in the mammalian retina***

Camille Boudreau-Pinsonneault[1], Michel Fries[2], Awais Javed[2], Michel Cayouette[3]

[1]McGill University, [2]IRCM, [3]Institut de Recherche Clinique de Montreal (IRCM)

2-C-103 ***The 15q13.3 gene OTUD7A regulates multiple neurodevelopmental disorder signaling networks***

Brianna Unda[1], Savannah Kilpatrick[1], Sansi Xing[1], Vickie Kwan[1], Nicholas Holzapfel[1], Leon Chalil[1], Nadeem Murtaza[1], Elizabeth McCready[1], Yu Lu[1], Brad Doble[1], Stephen Scherer[2], Karun Singh[1]

[1]McMaster University, [2]The Hospital for Sick Children

2-C-104 ***Intratumoral modulation therapy effectively enhances multi-modality treatment platforms for pediatric diffuse intrinsic pontine glioma***

Andrew Deweyert[1]

[1]University of Western Ontario

2-C-105 ***Therapeutic effects of embryonic and neonatal docosahexaenoic acid supplementation in the fragile X mouse model***

Jason Arsenault[1], Octavia Yifeng Weng[2], Chengye Yang[2], Yi-Mei Yang[3], Lu-Yang Wang[1]

[1]The Hospital for Sick Children, [2]SickKids Research Institute, [3]University of Minnesota

2-C-106 ***ALS-linked MATR3 S85C mutation causes motor deficits in mice***

Jihye Rachel Kim[1], Rebekah van Bruggen[1], Jeehye Park[2]

[1]University of Toronto, [2]The Hospital for Sick Children

2-C-107 ***Characterizing behavioural changes in a primate model of alzheimer's disease***

Robert Wither[1], Susan Boehnke[1], Robert Marino[1], Ron Levy[1], DJ Cook[1], Fernanda De Felice[1], Douglas Munoz[1]

[1]Queen's University

2-C-108 ***Altered circadian modulation of neurotransmission in bipolar mouse model***

Alesya Evstratova[1], Tiago Soares Silva[1], Martin Beaulieu[1]

[1]University of Toronto

2-C-109 ***Increased seizure susceptibility after traumatic brain injury in zebrafish***

Sung-Joon Cho[1], Eugene Park[2], Andrew Baker[2], Aylin Reid[1]

[1]University Health Network, [2]St Michael's Hospital

2-C-110 ***Novel zebrafish models to understand respiratory depression and analgesia by opioids***

Shenhab Zaig[1], Carolina Scarpellini[1], Xiao-Yan Wen[1], Gaspard Montandon[1]

[1]St. Michael's Hospital

2-C-111 ***Fly genetic screen reveals modifiers of MATR3 toxicity***

Melody Zhao[1], Hongxian Zhu[1], Rebekah van Bruggen[1], Jeehye Park[2]

[1]University of Toronto, [2]The Hospital for Sick Children

2-C-112 ***Pyrimidinergic signaling alterations in the Fragile X Syndrome mouse cortex***

Kathryn Reynolds[1], Chloe Wong[1], Laurie Doering[1], Angela Scott[1]

[1]McMaster University

2-C-113 ***Synaptic dysfunction in human neurons with autism-associated deletions in PTCHD1-AS***

P Joel Ross[1], Wenbo Zhang[2], Kirill Zaslavksy[3], Eric Deneault[3], Rebecca Mok[2], Lia D'Abate[2], Deivid Rodrigues[2], Ryan Yuen[2], Wei Wei[2], Alina Piekna[2], Peter Pasceri[2], Rebecca Landa[4], Michael Salter[2], Stephen Scherer[2], James Ellis[2]

[1]University of Prince Edward Island, [2]The Hospital for Sick Children, [3]University of Toronto, [4]Kennedy Krieger Institute

2-C-114 ***Examining the physiological mechanisms of rTMS-induced EEG alpha suppression in depressed patients with connectome-based neural mass modelling***

John Griffiths[1], Peter Fettes[2], Jonathan Downar[2], Jeremie Lefebvre[3]

[1]Centre for Addiction and Mental Health, [2]University Health Network, [3]Krembil Research Institute, University Health Network

2-C-115 ***The role of Natural Killer cells in mediating the effects of Maternal Immune Activation on offspring brain and behaviour***

Faraj Haddad[1], Cleusa De Oliveira[1], Susanne Schmid[1]

[1]University of Western Ontario

2-C-116 ***Dysfunction of NMDA receptors in neurons derived from human induced pluripotent stem cells with deletions of PTCHD1-antisense long noncoding RNA***

Wen-Bo Zhang[1], P. Joel Ross[2], Eric Deneault[3], Kirill Zaslavsky[1], Wei Wei[1], Alina Piekna[1], Peter Pasceri[1], Stephen Scherer[1], James Ellis[1], Michael Salter[1]

[1]The Hospital for Sick Children, [2]University of Prince Edward Island, [3]University of Toronto

2-C-117 ***Transcriptional profiling of a presymptomatic Rett syndrome mouse model***

Laura Hergott[1], Stephanie Kyle[1], Neeti Vashi[1], Monica Justice[1]

[1]The Hospital for Sick Children

2-C-118 ***Accelerated forgetting of previously acquired fear memory after repeated PTZ seizures***

Lianne Brandt[1], Hugo Lehmann[1], Neil Fournier[1]

[1]Trent University

2-C-119 ***Direct lineage reprogramming of astrocytes to oligodendrocytes***

Justine Bajohr[1], Kevin Lee[1], Alexandra Traister[1], Maryam Faiz[1]

[1]University of Toronto

2-C-120 ***Subjective memory ability correlates with functional connectivity between the hippocampus and posterior default mode network in cognitively normal older adults***

Linda Mah[1], Darren Liang[1], Frankie Chan[1], Aliya Ali[1], Mirjam Mulder-Heijstra[1], Susan Vandermorris[1], Nicolaas Paul LG Verhoeff[1], Nathan Herrmann[1], J. Jean Chen[1]

[1]University of Toronto

2-C-121 ***Emergence of palmitoylation as a regulator of autophagy in neurodegeneration***

Dale Martin[1]

[1]University of Waterloo

2-C-122 ***Relationship between dorsolateral prefrontal brain activation and microstructure in patients with schizophrenia***

Christin Schifani[1], Colin Hawco[1], Arash Nazeri[2], Daniel Blumberger[1], Zafiris Daskalakis[1], Aristotle Voineskos[1]

[1]Centre for Addiction and Mental Health, [2]Washington University School of Medicine

D - Sensory and motor systems

2-D-123 ***Sensorimotor behaviour in the connexin-35b (Cx35b) knock-out zebrafish (danio rerio)***

Cherie Brown[1], Christiane Zoidl[1], Georg Zoidl[1]

[1]York University

2-D-124 ***Temporal processing of multisensory events: predicting cybersickness in virtual reality***

Ogai Sadiq[1], Michael Barnett-Cowan[1]

[1]University of Waterloo

2-D-125 ***Dominant vs non-dominant hand differences in early somatosensory evoked potentials in response to a novel motor tracing task***

Mahboobeh Zabihhosseinian[1], Ryan Gilley[1], Danielle Andrew[2], Bernadette Murphy[3], Paul Yielder[1]

[1]University of Ontario Institute of Technology, [2]University of Waterloo, [3]University of Ontario Institute of Technology (UOIT)

2-D-126 ***Anatomical and physiological characterization of the claustrum-retrosplenial cortex circuit***

Brian Marriott[1], Jesse Jackson[1]

[1]University of Alberta

2-D-127 ***Substrates for caudal-rostral gradient of operational switch in larval zebrafish swimming circuits***

Stephanie Gaudreau[1], Yann Roussel[2], Vanessa Gallo[1], Melissa Paradis[1], Benjamin Lindsey[3], Tuan Bui[1]

[1]University of Ottawa, [2]École Polytechnique Fédérale de Lausanne, [3]University of Manitoba

2-D-128 ***Dissecting long-range reinforcement signals to GABAergic interneurons in the motor cortex***

Candice Lee[1], Simon Chen[1]

[1]University of Ottawa

2-D-129 ***Distinct expression patterns of Acid - Sensing Ion Channels in mouse primary sensory afferents***

Melina Papalampropoulou-Tsiridou[1], Feng Wang[1], Yves de Koninck[1]

[1]Université Laval

2-D-130 ***Back to the basics: Mapping the activated neurons in a mouse model of parkinson's disease***

Alysia Ross[1], Shawn Hayley[1], Hongyu Sun[1]

[1]Carleton University

2-D-131 ***Prevalence of BDNF polymorphism in musicians: evidence for compensatory motor learning strategies in music?***

Tara Henechowicz[1], Leonardo Cohen[1], Joyce Chen[1], Michael Thaut[1]

[1]University of Toronto

2-D-132 ***Chronic and acute pain sensory system of the African naked mole-rat***

Sandra Poulson[1], Melissa Holmes[1], Loren Martin[1]

[1]University of Toronto Mississauga

2-D-133 ***Evidence for neocortical learning induced by sensory surprise***

Colleen Gillon[1], Jérôme Lecoq[2], Jed Perkins[2], Sam Seid[2], Carol Thompson[2], Ryan Valenza[2], Joel Zylberberg[3], Blake Richards[1]

[1]University of Toronto, [2]Allen Institute for Brain Science, [3]York University

2-D-134 ***The role of GluN2D function and modulation in spinal cord pain signalling***

Christopher Dedek[1], Michael Hildebrand[1]

[1]Carleton University

2-D-135 ***Regulators of G-protein-signaling 4 regulate inhibition of the respiratory network by opioid ligands***

Jamil Danaf[1], Carolina Scarpellini[1], Richard Horner[2], Gaspard Montandon[1]

[1]St. Michael's Hospital, [2]University of Toronto

2-D-136 ***In search of the larval zebrafish striatal homologue***

Vernie Aguda[1], Michael Martin[1], Nicholas Guilbeault[1], Indira Riadi[1], Helen Chasiotis[1], Laura Koek[1], Jordan Guerguiev[1], Tod Thiele[2]

[1]University of Toronto Scarborough, [2]University of Toronto

2-D-137 ***Sex, APOE, and dementia family history: Relationship between dementia risk and cognitive-motor integration performance***

Alica Rogojin[1], Diana Gorbet[1], Kara Hawkins[1], Lauren Sergio[1]

[1]York University

2-D-138 ***Impact of DREADD-induced inhibition of general, cholinergic and glutamatergic PPTg neurons on prepulse inhibition***

Niveen Fulcher[1], Erin Azzopardi[1], Cleusa De Oliveira[1], Roger Hudson[1], Steven Laviolette[1], Susanne Schmid[1]

[1]University of Western Ontario

2-D-139 ***Glucose effects on intracortical and corticospinal excitability: a double-blinded, placebo-controlled study***

Stephen Toepp[1], Chiara Nicolini[1], Aimee Nelson[1]

[1]McMaster University

2-D-140 ***Serotonin modulates feedback-mediated neural and behavioral sensory adaptation***

Mariana Marquez[1], Maurice Chacron[1]

[1]McGill University

2-D-141 ***The utilization of translational behaviours to study sensory processing in the Cntnap2-/- rat model of ASD***

Kaela Scott[1], Susanne Schmid[1], Brian Allman[1]

[1]University of Western Ontario

2-D-142 ***Visual looming and receding stimuli activate a large brain network in the common marmoset***

Justine Clery[1], David Schaeffer[1], Yuki Hori[1], Kyle Gilbert[1], Joseph Gati[1], Stefan Everling[1]

[1]University of Western Ontario

2-D-143 ***Single unit activities in the marmoset parietal cortex during a saccadic task***

Liya Ma[1], Janahan Selvanayagam[1], Lauren Schaeffer[1], Kevin Johnston[1], Stefan Everling[1]

[1]University of Western Ontario

2-D-144 ***The mechanisms of ultra-high precision in an oscillatory neural circuit***

Aaron Shifman[1], Yiren Sun[1], John Lewis[1]

[1]University of Ottawa

2-D-145 ***Temporally diverse glutamate signals drive direction-selective starburst amacrine cell dendrites in the mouse retina***

Zachary Turple[1], Varsha Jain[1], Tracy Michaels[1], Santhosh Sethuramanujam[1], Gautam Awatramani[1]

[1]University of Victoria

E - Homeostatic and neuroendocrine systems

2-E-146 ***Sequenom sequencing identifies SNPs associated with anhedonia and fearfulness in rats***

Li Li[1], Zi Han Wang[2], Oscar Vasquez[3], Maria Aristizabal[3], Nick O'Toole[1], Irina Pokhvisneva[1], Josie Diorio[2], Amsale Belay[4], Marla Sokolowski[3], Tie Yuan Zhang[1], Michael Meaney[1]

[1]McGill University, [2]Douglas Institute, McGill University, [3]University of Toronto, [4]Clinical Genomics Cneter

2-E-147 ***Perinatal high-fat diet alters the neuroendocrine stress response to neonatal immune activation***

Mouly Rahman[1], Ceren Sogukpinar[1], Patrick McGowan[1]

[1]University of Toronto

2-E-148 ***Examining the interplay between inflammation and endocannabinoids in the amygdala during colitis***

Haley Vecchiarelli[1], Kaitlyn Tan[2], Vincent Chiang[2], Maria Morena[2], Min Qiao[2], Catherine Keenan[2], Samantha Baglot[2], Robert Aukema[2], Gavin Petrie[2], Quentin Pittman[2], Keith Sharkey[2], Matthew Hill[2]

[1]University of Calgary, Hotchkiss Brain Institute, [2]University of Calgary

2-E-149 ***Dietary fructose induces synaptic plasticity at Neuropeptide Y neurons***

Mikayla Payant[1], Jenny Campbell[1], Alex Hebert[1], Eleftheria Maratos-Flier[2], Melissa Chee[1]

[1]Carleton University, [2]Beth Israel Deaconess Medical Center, Harvard Medical School

2-E-150 ***Estimation of chromatin state and transcription factor dynamics across sex, estrus cycle, and puberty in the mouse hypothalamus***

Dustin Sokolowski[1], Huayun Hou[1], Liis Uuskula-Reimand[1], Dustin Sokolowski[1], Cadia Chan[1], Anna Roy[1], Anna Goldenberg[1], Mark Palmert[2], Michael Wilson[2]

[1]University of Toronto, [2]The Hospital for Sick Children

2-E-151 ***CRH-PVN neurons decode stress controllability and control voluntary escape***

Nuria Daviu Abant[1], Tamas Fuzesi[1], David Rosenegger[2], Neilen Rasiah[2], Toni-Lee Sterley[1], Govind Peringod[2], Jaideep Bains[2]

[1]University of Calgary, [2]Hotchkiss Brain Institute

2-E-152 ***Neural mechanisms linking hypernatremia to circadian time***

Claire Gizowski[1], Charles Bourque[1]

[1]McGill University

2-E-153 ***Multiscale neurobiological pathways to comfort food consumption in response to stress***

Andre Portella[1], Zhenfeng Ma[2], Laurette Dube[1]

[1]McGill University, [2]Wilfrid Laurier University

2-E-154 ***microRNA and mRNA expression profiles reveal sexually dimorphic miRNA-gene regulatory networks in the mouse pituitary gland***

Cadia Chan[1], Huayun Hou[1], Liis Uuskula-Reimand[1], Dustin Sokolowski[1], Anna Roy[1], Kyoko Yuki[2], Matt Hudson[1], Mark Palmert[2], Zhaolei Zhang[1], Michael Wilson[2]

[1]University of Toronto, [2]The Hospital for Sick Children

2-E-155 ***The impact of the growth hormone secretagogue receptor in the ventral tegmental area on stress-induced feeding in mice***

Andrea Smith[1], Brenna MacAulay[1], Rebecca Prowse[1], Lindsay Hyland[1], Alfonso Abizaid[1]

[1]Carleton University

F - Cognition and behavior

2-F-156 ***Does neurogenesis predict hippocampus- and olfactory-dependent learning deficits in the goto-kakizaki rat?***

Alanna Chalk[1], Diano Marrone[1], Chelsey Damphousse[1], Nicole Micks[1], Jaclyn Medeiros[1], Josephine Esposto[1], Cassie Vivian[1], Nicholas Dosen[1]

[1]Wilfrid Laurier University

2-F-157 ***An fMRI investigation of personal semantics***

Annick Tanguay[1], Daniela Palombo[2], Patrick Davidson[3], Louis Renoult[4]

[1]Rotman Research Institute, [2]University of British Columbia, [3]University of Ottawa, [4]University of East Anglia

2-F-158 ***Characterizing the activity of neural assemblies in the hippocampus across the full sleep-wake cycle***

Richard Boyce[1], Rosa Cossart[1]

[1]Inserm

2-F-159 ***Study of memory and perceptual disorders in patients with Alzheimer's disease***

Moussa Ahmadou Taher[1], Belahsen Mohammed Faouzi[2], Ahami Ahmed Omar Touhami[3]

[1]Laboratoire de Neurosciences Cognitivo-Comportementale et Nutrition appliquée, [2]Hassan II University Hospital, Fes, Morocco, [3]Cognitivo-Behavioral Neuroscience and Applied Nutrition Laboratory

2-F-160 ***Chemogenetic excitation of ventral tegmental area dopamine neurons suppresses feeding but not responding to an alcohol conditioned stimulus***

Milan Valyear[1], Soraya Lahlou[1], Ghislaine Deyab[1], Alexa Brown[1], Nina Caporicci-Dinucci[1], Nadia Chaudhri[1]

[1]Concordia University

2-F-161 ***Excitatory context conditioning promotes the reinstatement of appetitive Pavlovian conditioning***

Mandy LeCocq[1], Nadia Chaudhri[1]

[1]Concordia University

2-F-162 ***Impact of ketamine on fear memory extinction and hippocampal reelin expression after corticosterone administration in rats***

Jenessa Johnston[1], Brian Kulyk[2], Raquel Romay-Tallon[1], Hector Caruncho[1], Lisa Kalynchuk[1]

[1]University of Victoria, [2]University of Saskatchewan

2-F-163 ***Episodic caching assists model free control in reinforcement learning tasks with changing reward contingencies***

Annik Carson[1], Blake Richards[2]

[1]University of Toronto Scarborough, [2]University of Toronto

2-F-164 ***Depleting catecholamines impair motivation, but not cognition, in rhesus macaques***

Mavis Kusi[1], Martin Pare[1], Catherine Crandell[1]

[1]Queen's University

2-F-165 ***Investigating the cell type-specific roles of Npas4 in spine reorganisation during motor learning***

Pablo Serrano[1], Jungwoo Yang[1], Simon Chen[1]

[1]University of Ottawa

2-F-166 ***Optogenetic activation of the infralimbic cortex to nucleus accumbens shell circuit attenuates the renewal of appetitive Pavlovian responding***

Franz Villaruel[1], Nadia Chaudhri[1]

[1]Concordia University

2-F-167 ***Transplanting immortal orexin cells in narcolepsy***

Sara Pintwala[1], Jennifer Chalmers[1], Jimmy Fraigne[1], Denise Belsham[1], John Peever[1]

[1]University of Toronto

2-F-168 ***Reduced functional interactions between the right entorhinal cortex and the posterior cingulate cortex in adults at risk for Alzheimer's disease***

Gillian Coughlan[1], Peter Zhukovsky[2], Rachel Gillings[1], Vaisakh Puthusseryppady[1], Donnie Cameron[1], Michael Hornberger[1]

[1]Norwich Medical School, UEA, [2]Cambridge University

2-F-169 ***Neural correlates of extinction in a rat model of appetitive Pavlovian conditioning***

Alexa Brown[1], Franz Villaruel[1], Nadia Chaudhri[1]

[1]Concordia University

2-F-170 ***The effect of CCR5 antagonist Maraviroc in chronic oxycodone self-administration in rats.***

Catarina Borges[1], Nour Quteishat[1], Émilie Fortin[1], Vanessa Moman[1], Alexandra Chisholm[1], Craig Ferris[2], Uri Shalev[1]

[1]Concordia University, [2]Northeastern University College of Science

2-F-171 ***Investigating the role of proteasome-mediated synaptic protein degradation underlying novelty-induced object memory destabilization in the perirhinal cortex***

Cassidy Wideman[1], Samantha Creighton[1], Kristen Jardine[1], Vino Thayalan[1], Krista Mitchnick[1], Bettina Kalisch[1], Boyer Winters[1]

[1]University of Guelph

2-F-172 ***Discovery of pharmacological approaches to selectively treat mood disorders caused by metabolic stress***

Thomas Horman[1], Matthew Scott[1], Francesco Leri[1]

[1]University of Guelph

2-F-173 ***Ventral hippocampal and amygdala interactions during context fear discrimination***

Robert Rozeske[1], Léonie Runtz[1], Aaron Sossin[1], Alexandra Keinath[1], Mark Brandon[1]

[1]McGill University

2-F-174 ***Successful decoding of sequence-specific duration information from human hippocampal long-term memory activity patterns***

Sathesan Thavabalasingam[1], Edward O'Neil[1], Jonathan Tay[1], Adrian Nestor[1], Andy Lee[1]

[1]University of Toronto

2-F-175 ***Systemic injections of either L- or D-Lactate enhance retrograde, but not anterograde, inhibitory avoidance memory in young adult male Sprague-Dawley rats***

Claire Scavuzzo[1], Irina Rakotovao[1], Clayton Dickson[1]

[1]University of Alberta

2-F-176 ***A novel method of producing behavioural, genetic, and physiological changes from mild traumatic brain injury in mice***

Eric Eyolfson[1], Glenn Yamakawa[1], Richelle Mychasiuk[2], Alexander Lohman[1]

[1]University of Calgary, [2]Monash University

2-F-177 ***Spatial memory formation requires netrin-1 expression by neurons in the adult mammalian brain***

Edwin Wong[1], Stephen Glasgow[1], Lianne Trigiani[1], Daryan Chitsaz[1], Vladimir Rymar[1], Abbas Sadikot[1], Edward Ruthazer[1], Edith Hamel[1], Timothy Kennedy[1]

[1]McGill University

2-F-178 ***The adaptor protein NCK1 is a regulator of anxiety-like behaviors***

Antonios Diab[1], Jiansong Qi[1], Crystal Milligan[1], James Fawcett[1]

[1]Dalhousie University

2-F-179 ***Effects of estrogen depletion, age, and functional brain activity on associative memory in spontaneous menopause and surgically-induced menopause***

Alana Brown[1], Anne Almey[1], Nicole Gervais[1], Annie Duchesne[2], Laura Gravelsins[1], Elizabeth Baker-Sullivan[1], Daniel Nichol[3], Giulia Baracchini[3], Cheryl Grady[4], Gillian Einstein[1]

[1]University of Toronto, [2]University of Northern British Columbia, [3]Rotman Research Institute, Baycrest Health Sciences, [4]University of Toronto and Rotman Research Institute, Baycrest Health Sciences

2-F-180 ***Behavioural characterization of the Nrxn1+/- mouse model of autism spectrum disorder***

Qendresa Sahiti[1], Spencer Brown[1], Richard Brown[1]

[1]Dalhousie University

2-F-181 ***Norepinephrine in auditory processing areas enhances the developmental learning of communication signals***

Sarah Woolley[1], Jon Sakata[1], Yining Chen[1]

[1]McGill University

2-F-182 ***A novel 'enrichment track' protocol produces enhanced cognitive benefits compared with traditional home cage enrichment in mice***

Heather Collett[1], Sandra Gattas[2], Ethan Huff[1], Samantha Creighton[1], Shoshana Buckhalter[1], Siobhon-Elora Weber[1], Silas Manning[1], Bruce McNaughton[3], Boyer Winters[1]

[1]University of Guelph, [2]University of California, Irvine, [3]Lethbridge University

2-F-183 ***Extinction and reinstatement of cue-based reward-seeking after chemogenetic activation of VTA-GABA neurons***

Justin McGraw[1], Sondos Al-Khaledi[1], Martin Leigh[2], Ken Wakabayashi[1], Malte Feja[3], Caroline Bass[2]

[1]University at Buffalo, [2]SUNY at Buffalo, [3]University of Veterinary Medicine Hannover

2-F-184 ***Behavioral effects of long-term, high-dose nicotine exposure during adolescence in rats***

Cassandra Sgarbossa[1], Jude Frie[1], Allyson Andrade[1], Briana Renda[1], Joshua Smit[1], Lauren King[1], Samantha Creighton[1], Boyer Winters[1], Jennifer Murray[1], Jibran Khokhar[1]

[1]University of Guelph

2-F-185 ***The effect of chemogenetic modulation of cortico-thalamic projections in the augmentation of heroin seeking induced by chronic food restriction***

Alexandra Chisholm[1], Émilie Fortin[1], Vanessa Moman[1], Damaris Rizzo[1], Jean-Philippe Manoliadis[1], Nour Quteishat[1], Uri Shalev[1]

[1]Concordia University

2-F-186 ***Enhancement of memory consolidation by cocaine, nicotine, and their conditioned contexts may be mediated by a common noradrenergic mechanism***

Michael Wolter[1], Talia Speigal[1], Boyer Winters[1], Francesco Leri[1]

[1]University of Guelph

2-F-187 ***Does sex moderate the relationship between prudent diet consumption and cognition in late life?: Findings from the NuAge study***

Danielle D'Amico[1], Matthew Parrott[2], Carol Greenwood[3], Guylaine Ferland[4], Pierrette Gaudreau[4], Sylvie Belleville[4], Danielle Laurin[5], Nicole Anderson[3], Bryna Shatenstein[4], Marie-Jeanne Kergoat[4], Jose Morais[6], Alexandra Fiocco[1]

[1]Ryerson University, [2]Concordia University, [3]University of Toronto, [4]Université de Montréal, [5]Université Laval, [6]McGill University

2-F-188 ***The behavioural effects of lipopolysaccharide in adolescent male and female rats***

Indra Bishnoi[1], Martin Kavaliers[1], Klaus-Peter Ossenkopp[1]

[1]University of Western Ontario

2-F-189 ***Adult neurogenesis mediates forgetting in the rat***

Kelsea Gorzo[1], Jonathan Epp[1]

[1]Hotchkiss Brain Institute

2-F-190 ***Effects of MAGL inhibition on free intake of sucrose and effort-based decision-making***

Sondos Al-Khaledi[1], Justin McGraw[1], Martin Leigh[2], Kimberly Bernosky-Smith[3], Ken Wakabayashi[1], Malte Feja[4], Caroline Bass[2]

[1]University at Buffalo, [2]SUNY at Buffalo, [3]D'Youville College, [4]University of Veterinary Medicine Hannover

2-F-191 ***Heterogeneous contribution of endocannabinoids to cue-induced reward seeking in the Nucleus accumbens and ventral tegmental area.***

Martin Leigh[1], Malte Feja[2], Ajay Baindur[1], Wakabayashi Ken[1], Micah Niphakis[3], Ben Cravatt[4], Caroline Bass[1]

[1]SUNY at Buffalo, [2]University of Veterinary Medicine Hannover, [3]Abide Therapeutics, [4]The Skaggs Institute for Chemical Biology

2-F-192 ***A large-scale spiking neuron model of the neurobiology underlying innate defensive behaviors***

Kathryn Simone[1], Nuria Daviu Abant[1], Kartikeya Murari[1], Jaideep Bains[2]

[1]University of Calgary, [2]Hotchkiss Brain Institute

2-F-193 ***Short and long-term effects of adolescent cannabis and alcohol co-use***

Shahnaza Hamidullah[1], Claudia Lutelmowski[1], Jibran Khokhar[1]

[1]University of Guelph

2-F-194 ***Impact of early estrogen deprivation on sleep quality and hippocampal volume in middle-aged women: preliminary findings***

Nicole Gervais[1], Gina Nicoll[1], Elizabeth Baker-Sullivan[1], Leanne Mendoza[1], Claire Lauzon[1], Anne Almey[1], Laura Gravelsins[1], Alana Brown[1], Annie Duchesne[2], Rosanna Olsen[1], Cheryl Grady[3], Gillian Einstein[1]

[1]University of Toronto, [2]University of Northern British Columbia, [3]University of Toronto and Rotman Research Institute, Baycrest Health Sciences

2-F-195 ***Evaluating mindfulness-induced cognitive changes: Scope for improving inhibitory control in young adults***

Varsha Singh[1], Vaishali Mutreja[1]

[1]Indian Institute of Technology, Delhi

2-F-196 ***Synthetic estrogen and cognition: Do time of oral contraceptive ingestion and the COMT Val158Met polymorphism affect working memory?***

Laura Gravelsins[1], Ava Ma de Sousa[1], Clara McNamee[1], Karla Machlab[1], Pascale Tsai[1], Brittany Demircan[1], Leah Velikonja[1], Katherine Duncan[1], Gillian Einstein[1]

[1]University of Toronto

2-F-197 ***Hemispheric differences in functional interaction between dorsal lateral prefrontal cortex and ipsilateral motor cortex***

Yanqiu Wang[1], Na Cao[1], Robert Chen[2], Jian Zhang[1]

[1]Shanghai University of Sport, [2]Krembil Brain Institute

2-F-198 ***Opposing effects of cortisol on learning and memory in children using spatial versus response-dependent navigation strategies***

Caroll-Ann Blanchette[1], Vanessa Kurdi[2], Celine Fouquet[2], Russell Schachar[3], Michel Boivin[4], Paul Hastings[5], Philippe Robaey[6], Greg West[7], Veronique Bohbot[2]

[1]University of Montreal, [2]McGill University, [3]University of Toronto, [4]Université Laval, [5]University of California Davis, [6]Ste-Justine research center, [7]Université de Montréal

2-F-199 ***The role of for in Drosophila melanogaster social interaction networks (SINs)***

Nawar Alwash[1], Marla Sokolowski[1], Joel Levine[1]

[1]University of Toronto

2-F-200 ***Where you look on a face matters! The N170 ERP component is modulated by featural fixation in adults with and without autism spectrum disorder***

Karisa Parkington[1], Roxane Itier[1]

[1]University of Waterloo

2-F-201 ***Exendin-4 dose dependently attenuates responding to reward predictive cues in rats***

Ajay Baindur[1], Ken Wakabayashi[2], Karie Chen[2], Malte Feja[3], Kimberly Bernosky-Smith[4], Caroline Bass[1]

[1]SUNY at Buffalo, [2]University at Buffalo, [3]University of Veterinary Medicine Hannover, [4]D'Youville College

2-F-202 ***Executive functioning and risk-taking are predicted by the spontaneous navigation strategy***

Etienne Aumont[1], Veronique Bohbot[2], Gregory West[3]

[1]Université du Québec à Montréal, [2]McGill University, [3]Université de Montréal

2-F-203 ***Regulation of valence learning and discrimination in mice***

T Chase Clark[1], Rosemary Bagot[1]

[1]McGill University

2-F-204 ***Attentional filtering within versus across hemifields in the lateral prefrontal cortex***

maryam nouri kadijani[1], Theda Backen[2], Julio Martinez-Trujillo[3], Jörn Diedrichsen[4], Stefan Treue[5]

[1]Robarts Research Institute, University of Western Ontario, [2]McGill University, [3]University of Western Ontario, [4]Western University, [5]Leibniz-Institut fur Primatenforschung

2-F-205 ***Serotonin mediates C. elegans associative learning by indicating the presence of food***

Safa Ansar[1], Sara Campitelli[1], Daniel Merritt[1], Derek van der Kooy[1]

[1]University of Toronto

2-F-206 ***Locus coeruleus activity in a classical conditioning task***

Mohsen Omrani[1], Mina Ghbrial[1], Janusz Rajkowski[1], Gary Aston-Jones[1]

[1]Rutgers University

2-F-207 ***K-means feature detection within sleep and wake brain states: A study with local field potential recordings in a freely behaving rat***

Pauline Balogun[1], Karim Ali[1], Masami Tatsuno[1]

[1]Lethbridge University

2-F-208 ***Lateral entorhinal cortex selectively routes mnemonic features of stimuli to the medial prefrontal cortex***

Xiao Yu[1], Justin Jarovi[1], Kaori Takehara-Nishiuchi[2]

[1]University of Toronto St. George, [2]University of Toronto

2-F-209 ***Computational evidence for a novel role of neurogenesis in memory generalization***

Lina Tran[1], Sheena Josselyn[2], Blake Richards[2], Paul Frankland[2]

[1]The Hospital for Sick Children, [2]University of Toronto

2-F-210 ***Neurogenesis impairs fear expression and alters CA1 population dynamics during memory recall***

Adam Ramsaran[1], Andrew Mocle[1], Lina Tran[2], Alexander Jacob[1], Jessica Jiménez[3], Mazen Kheirbek[4], Sheena Josselyn[1], Paul Frankland[1]

[1]University of Toronto, [2]The Hospital for Sick Children, [3]Columbia University, [4]UCSF

2-F-211 ***Hierarchically-organized attentional sets bias both information-sampling and choices to feature values, feature dimensions, and contextual information during rule-based learning***

Marcus Watson[1], Benjamin Voloh[2], Milad Naghizadeh[3], Thilo Womelsdorf[2]

[1]York University, [2]Vanderbilt University, [3]University of Lethbridge

2-F-212 ***To exclude or not to exclude: systematic bias introduced by quality control in pediatric imaging research***

Hajer Nakua[1], Natalie Forde[2], Colin Hawco[2], Aristotle Voineskos[2], Anne Wheeler[3], Meng-Chuan Lai[2], Peter Stazmari[2], Russell Schachar[3], Evdokia Anagnostou[3], Paul Arnold[4], Jason Lerch[3], Stephanie Ameis[2]

[1]University of Toronto, [2]Centre of Addiction and Mental Health, [3]Sick Kids Hospital, [4]Hotchkiss Brain Institute

G - Novel methods and technology development

2-G-213 ***Triggering naturalistic and synthetic sequences of optogenetic stimulation with an Arduino-based pattern generator***

Hendrik Steenland[1], Lyla El-Fayomi[2], Michael Bergamini[2], Derek van der Kooy[2]

[1]NeuroTek, [2]University of Toronto

2-G-214 ***Optogenetically eliciting precisely-timed action potentials in cerebellar Purkinje cell axons***

Kim Gruver[1], Alanna Watt[1]

[1]McGill University

2-G-215 ***A knock-in strategy to study protein localization in human induced pluripotent stem cell (iPSC)-derived cortical neuron through genome editing***

Quanwei Lyu[1], Ruolin Fan[1], Yat-Ping Tsui[1], Ying-Shing Chan[1], Daisy K.Y. Shum[1], Kwok-On Lai[1]

[1]The University of Hong Kong

2-G-216 ***3D modeling of cerebral sinuses to detect abnormal venous drainage in mild traumatic brain injury: 9.4T MRI animal studies***

Qandeel Shafqat[1], A. Max Hamilton[1], Jennaya Christensen[1], Elizabeth Imhof[1], Richelle Mychasiuk[2], Jeff Dunn[1]

[1]University of Calgary, [2]Monash University

2-G-217 ***Controlling robot PLEN.D by EEG on recalling ten images of its movement***

Takahiro Yamanoi[1], Hiroshi Takayanagi[2], Hisashi Toyoshima[3], Toshimasa Yamazaki[4], Michio Sugeno[5]

[1]Hokkai-Gakuen University, [2]Fudan University, [3]Japan Technical Software, [4]Kyushu Institute of Technology, [5]Tokyo Institute of Technology

2-G-218 ***Using kinematic and qualitative analyses in a rat model of stroke to quantify recovery after repetitive transcranial magnetic stimulation***

Zanna Vanterpool[1], Julia Boonzaier[2], Michel Bernabei[3], Huub Maas[1], Rick Dijkhuizen[2]

[1]Vrije Universiteit Amsterdam, Amsterdam Movement Sciences, [2]University Medical Center Utrecht and Utrecht University, [3]Northwestern University

2-G-219 ***Cross-frequency coupling features in scalp and intracranial EEG identify postictal generalized EEG suppression state***

Vasily Grigorovsky[1], Berj Bardakjian[1]

[1]University of Toronto

2-G-220 ***3D bioprinting of starch-chitosan scaffolds for engineering neural tissues***

Haley Butler[1], Andrew Tasker[1], Debra MacDonald[1], Ali Ahmadi[1]

[1]UPEI

2-G-221 ***Establishing the immune profile of cerebrospinal fluid from dogs with central nervous system diseases (preliminary results).***

Tamara Morrill[1], Fiona James[1], Janet Beeler-Marfisi[1], Olaf Berke[1], Stefan Keller[1]

[1]University of Guelph

2-G-222 ***Adapting miniscopes technology for in vivo calcium imaging in deep brain structures of freely moving rats***

Thomas Bassett[1], Ken Wakabayashi[1], Caroline Bass[2]

[1]University at Buffalo, [2]SUNY at Buffalo

2-G-223 ***Investigating the effects of dexamethasone on vascular permeability and inflammatory response following focused ultrasound and microbubble-mediated BBB treatment***

Dallan McMahon[1], Wendy Oakden[2], Kullervo Hynynen[1]

[1]University of Toronto, [2]Sunnybrook Research Institute

2-G-224 ***Brain emotional learning-inspired models for long term prediction of EEG***

Mahboobeh Parsapoor[1]

[1]McGill University

2-G-225 ***Extracting low-dimensional latent space trajectories from calcium fluorescence signals with deep generative models***

Luke Prince[1], Colleen Gillon[1], Blake Richards[1]

[1]University of Toronto

2-G-226 ***Development of a diffusion magnetic resonance imaging template for investigating short-ranged U-shaped structural connectivity in the human adult brain***

Jason Kai[1], Ali Khan[2]

[1]Western University, [2]University of Western Ontario

2-G-227 ***Functional inference of real neural networks with artifial neural networks***

Mohamed Bahdine[1], Simon Hardy[1], Patrick Desrosiers[1]

[1]Université Laval

2-G-228 ***Hippocampal morphology and cytoarchitecture in the 3D BigBrain***

Jordan DeKraker[1], Jonathan Lau[1], Kayla Ferko[1], Stefan Köhler[1], Ali Khan[1]

[1]University of Western Ontario

H - History, teaching, public awareness and societal impacts in neuroscience

2-H-229 ***The convergence curriculum: Arts, neuroscience, and society***

Cristian Zaelzer[1], Bettina Forget[1]

[1]Convergence, Perceptions of Neuroscience / Concordia University Faculty of Fine Arts

Poster cluster: Rodent cognitive neuroscience

2-Cluster-230 ***In vivo modulation of microglial activity using chemogenetics***

Aja Hogan-Cann[1], Diana Sakae[1], William Binning[1], Matthew Maksoud[2], Valeriy Ostapchenko[2], Mohammed Al-Onaizi[1], Sara Matovic[3], Wataru Inoue[2], Wei-Yang Lu[2], Vania Prado[2], Marco Prado[2]

[1]Robarts Research Institute, University of Western Ontario, [2]University of Western Ontario, [3]Robarts Research Institute

2-Cluster-231 ***Cholinergic regulation of plaque pathology in an Alzheimer's disease mouse model***

Liliana German-Castelan[1], Takashi Saido[2], Takaomi Saido[2], Marco Prado[3], Vania Prado[3]

[1]Western University, [2]RIKEN Brain Science Institute, [3]University of Western Ontario

2-Cluster-232 ***Prefrontal contributions to metacognitive decision making in the mouse***

Daniel Palmer[1], Sheena Josselyn[2], Timothy Bussey[3], Lisa Saksida[3]

[1]Western University, [2]University of Toronto, [3]University of Western Ontario

2-Cluster-233 ***Fiber photometry reveals dopamine reward prediction-error in the nucleus accumbens of mice during a touchscreen pavlovian autoshaping paradigm***

Miguel Skirzewski[1], Amy Reichelt[1], Julie Dumont[1], Fangmiao Sun[2], Yajun Zhang[2], Yulong Li[2], Jane Rylett[1], Vania Prado[1], Lisa Saksida[1], Marco Prado[1], Tim Bussey[1]

[1]University of Western Ontario, [2]Peking University School of Life Sciences, McGovern Institute for Brain Research

2-Cluster-234 ***Executive dysfunction in an APP knock-in mouse model of Alzheimer's disease revealed using touchscreen technology***

Julie Dumont[1], Chris Fodor[2], Flavio Beraldo[1], Elisha Jindal[2], Ashwin Harimohan[2], Takashi Saido[3], Takaomi Saido[3], R. Jane Rylett[2], Marco A.M. Prado[2], Timothy Bussey[1], Lisa Saksida[1], Vania Prado[1]

[1]University of Western Ontario, [2]Western University, [3]RIKEN Brain Science Institute

2-Cluster-235 ***Optimisation of a touchscreen spontaneous object recognition task in mice***

Amy Reichelt[1], Daniel Palmer[2], Subhan Shaikh[2], Lisa Saksida[1], Timothy Bussey[1]

[1]University of Western Ontario, [2]Western University

2-Cluster-236 ***Mouse performance on a novel touchscreen continuous performance task is dependent on signaling in the prelimbic cortex***

Tyler Dexter[1], Anita Taksokhan[1], Daniel Palmer[1], Amy Reichelt[2], Lisa Saksida[2], Tim Bussey[2]

[1]Western University, [2]University of Western Ontario

2-Cluster-237 ***Neurogenesis in the adult hippocampus and its role in mood***

Katrina Zmavc[1], Cecilia Kramar[2], Timothy Bussey[2], Lisa Saksida[2]

[1]Western University, [2]University of Western Ontario

2-Cluster-238 ***Mesopontine cholinergic signaling influences stress responses affecting behaviour***

Ornela Kljakic[1], Helena Janickova[1], Kaie Rosborough[1], Sanda Raulic[1], Sara Matovic[2], Robert Gros[1], Lisa Saksida[3], Timothy Bussey[3], Wataru Inoue[3], Marco Prado[3], Vania Prado[3]

[1]Robarts Research Institute, University of Western Ontario, [2]Robarts Research Institute, [3]University of Western Ontario

2-Cluster-239 ***Optimization of the touchscreen-based visuomotor conditional learning task in mice***

Oren Princz-Lebel[1], David Wasserman[1], Miguel Skirzewski[2], Penny MacDonald[2], Timothy Bussey[2], Lisa Saksida[2]

[1]Western University, [2]University of Western Ontario

2-Cluster-240 ***Integration of high-throughput touchscreen tasks and an open access database to evaluate cognitive dysfunction in mouse models of neurodegenerative diseases***

Flavio Beraldo[1], Daniel Palmer[2], Sara Memar[3], David Wasserman[2], Roseane Franco[1], Keon Coleman[1], Shuai Liang[4], Matthew Cowan[1], Robert Bartha[5], Stephen Strother[4], Boyer Winters[6], Lisa Saksida[1], Vania Prado[1], Timothy Bussey[1], Marco Prado[1]

[1]University of Western Ontario, [2]Western University, [3]Robarts Research Institute/ BrainsCAN, [4]Rotman Research Institute, [5]Robarts Research Institute, [6]University of Guelph

2-Cluster-241 ***The role of astrocytes in memory: focus on pattern separation***

Cecilia Kramar[1], Valeriy Ostapchenko[1], Olivia Reshmi Ghosh-Swaby[1], Vania Prado[1], Marco Prado[1], Tim Bussey[1], Lisa Saksida[1]

[1]University of Western Ontario

IBRO:

2-IBRO-242 Rapid-onset anti-depressant-like potential of xylopic acid in mice and zebrafish

Robert Biney[1], Charles Benneh[2], Donatus Adongo[2], Eric Woode[3]

[1]University of Cape Coast, [2]University of Health and Allied Sciences, [3]Kwame Nkrumah University of Science and Technology

2-IBRO-243 Comparison of outcome profiles between endoscopic third ventriculostomy (ETV) and ventriculoperitoneal shunt (VPS) in Malawian children diagnosed with hydrocephalus

Tuntufye Mwambyale[1], Patrick Kamalo[2]

[1]College of Medicine, University of Malawi, [2]Blantyre Institute of Neurological Sciences

2-IBRO-244 Effect of exposure to a cholinergic receptor agonist on cognition in a prolonged febrile seizure rat model

Cleopatra Rakgantsho[1], Gwladys Ngoupaye[1], Musa Mabandla[1]

[1]University of KwaZulu-Natal

Session 3 – Saturday, May 25

A – Development

3-A-1 ***The RB family instructs multiple aspects of adult NSC fate***

Bensun Fong[1], Renaud Vandenbosch[1], Joseph Bastasic[1], Smitha Paul[1], Ruth Slack[1]

[1]University of Ottawa

3-A-2 ***The role of different subpopulations of early- and adult-born granule cells in olfactory bulb functioning***

Sarah Malvaut[1], Tiziano Siri[1], Armen Saghatelyan[2]

[1]CERVO Brain Research Centre, [2]Université Laval

3-A-3 ***Clustered Protocadherins regulate Purkinje cell dendrite development and cerebellar motor-related functions***

Julie Marocha[1], Julie Lefebvre[1]

[1]The Hospital for Sick Children

3-A-4 ***Role of autophagy in neuronal migration under normal and pathological conditions***

Cédric Bressan[1], Marina Snapyan[1], Dave Gagnon[2], Simon Labrecque[1], Johannes Klaus[3], Paul De Koninck[2], Stephen Robertson[4], Silvia Cappello[3], Armen Saghatelyan[2]

[1]CERVO Brain Research Centre, [2]Université Laval, [3]Max Planck Institute of Psychiatry, [4]Dunedin School of Medicine, University of Otago

3-A-5 ***Semaphorin3f is a novel regulator of retinal progenitor cell differentiation***

Rami Halabi[1], Carrie Hehr[1], Sarah McFarlane[1]

[1]University of Calgary

3-A-6 ***Optogenetics study of the impact of the microbiota on brain development and function in zebrafish larvae***

Mado Lemieux[1], Vincent Boily[1], Rachel Barr[1], Gabriel Byatt[1], Tessa Herzog[1], Hamza Seghouani[1], Radu Turcitu[1], Marie-Ève Paquet[1], Nicolas Derome[1], Sylvain Moineau[1], Paul De Koninck[1]

[1]Université Laval

3-A-7 ***The role of activator E2Fs in adult neural stem cell quiescence and activation***

Daniel O'Neil[1], Edward Yakubovich[1], Bensun Fong[1], Renaud Vandenbosch[1], Ruth Slack[1]

[1]University of Ottawa

3-A-8 ***Morphological annotations of cerebellar interneuron diversity and implications for the clustered Protocadherins***

Wendy Wang[1], Julie Lefebvre[2]

[1]University of Toronto, [2]The Hospital for Sick Children

3-A-9 ***The adaptor protein p66Shc plays a key role in the neural differentiation of mouse embryonic stem cells***

Andrew Powell[1], Robert Cumming[1], Dean Betts[1]

[1]University of Western Ontario

3-A-10 ***Mitochondrial dynamics in the regulation of neural stem cell fate decisions.***

Mohamed Ariff Iqbal[1], Smitha Paul[1], Keir Menzies[1], Mary-Ellen Harper[1], Mireille Khacho[1], Ruth Slack[1]

[1]University of Ottawa

3-A-11 ***BDNF gene network, prenatal adversity and cognitive developmental trajectories in young children***

Euclides José de Mendonca Filho[1], Barbara Barth[2], Michael Meaney[2], Patricia Silveira[2], Patricia Silveira[2], Denise Ruschel[2]

[1]Universidade Federal do Rio Grande do Sul, [2]McGill University

3-A-12 ***Characterization of Fragment C-driven msx3 expression in dorsal radial glia in the context of neural tube development***

Shea Keil[1], Anabelle Morissette[1], David Zheng[1], Ben Lindsay[1], Marie-Andrée Akimenko[1], Tuan Bui[1]

[1]University of Ottawa

3-A-13 ***The ultrastructure and connectivity of C. elegans motor neurons across developmental remodelling***

Ben Mulcahy[1], Daniel Witvliet[1], James Mitchell[2], WanXian Koh[1], Maggie Chang[1], Peter Bermant[2], Douglas Holmyard[1], Richard Schalek[2], Jeff Lichtman[2], Andrew Chisholm[3], Aravinthan D.T. Samuel[2], Mei Zhen[1]

[1]Mount Sinai Hospital, [2]Harvard University, [3]University of California, San Diego

3-A-14 ***Investigating the role of RNA-binding protein hnRNP-K in asymmetric neural precursor cell divisions of the developing cerebral cortex***

Julia Brott[1], John Vessey[1]

[1]University of Guelph

3-A-15 ***Adult-born neurons inhibit developmentally-born neurons***

Alyssa Ash[1], Timothy O'Leary[1], Erin Chahley[1], Desiree Seib[1], Jason Snyder[1]

[1]University of British Columbia

3-A-16 ***Representing neural reconstructions as cyclic graphs allows investigation of contact-dependent models of dendrite self-avoidance***

Samantha Ing-Esteves[1], Roozbeh Farhoodi[2], Julie Lefebvre[3]

[1]University of Toronto / SickKids, [2]University of Pennsylvania, [3]The Hospital for Sick Children

3-A-17 ***The clustered Protocadherins control the survival and size of inhibitory interneuron populations in the developing brain.***

Candace Carriere[1], Wendy Wang[2], Anson Sing[1], Julie Marocha[1], Leonor Separi[1], Julie Lefebvre[1]

[1]The Hospital for Sick Children, [2]University of Toronto

B - Neural excitability, synapses, and glia: Cellular mechanisms

3-B-19 ***KCC2 manipulation alters features of migrating interneurons in ferret neocortex***

Francis Djankpa[1], Fritz Lischka[2], Mitali Chatterjee[2], Sharon Juliano[2]

[1]School of Medical Sciences, University of Cape Coast PMB, [2]Uniformed Services University of the Health Sciences

3-B-20 ***Investigating a potential activator of spreading depolarization released by stressed gray matter.***

Nikita Ollen-Bittle[1], Kelly Lee[1], Michael Fisher[1], Peter Gagolewicz[1], David Simon[1], Richard Oleschuk[1], Albert Jin[1], R. David Andrew[1]

[1]Queen's University

3-B-21 ***tLTD requires presynaptic NMDAR-mediated JNK signalling***

Jennifer Brock[1], Per Jesper Sjöström[1]

[1]McGill University

3-B-22 ***Transcriptional and translational regulation at the early and chronic phases of neuropathic pain***

Sonali Uttam[1], Marc Parisien[1], Seyed-Mehdi Jafarnejad[2], Mehdi Amiri[1], Francis Beaudry[3], Luda Diatchenko[1], Arkady Khoutorsky[1]

[1]McGill University, [2]Queen's University Belfast, [3]Université de Montréal

3-B-23 ***Neocortical potassium redistribution in vivo is influenced by neuronal/synaptic activity, pannexin channels, and astrocytic gap junctional communication***

Azin Ebrahim Amini[1], Bojana Stefanovic[2], Peter Carlen[3]

[1]UHN, [2]Sunnybrook Research Institute, [3]Krembil Research Institute

3-B-24 ***Classification of neuronal response patterns using machine learning and optimal feature sets: Linking in-vivo to in-vitro experiments***

Eric Kuebler[1], Milad Khaki[1], Michelle Jimenez[1], Jackson Blonde[2], Kelly Bullock[1], Florian Pieper[1], Roberto Gulli[3], Ben Corrigan[4], Lyndon Duong[1], Rogelio Luna[1], Gustavo Parfitt[1], Megan Roussey[1], Hiroyuki Igarashi[4], Julia Sunstrum[4], Sara Matovic[1], Meagan Wiederman[5], Chakravarthi Narla[1], Jaymin Jeong[1], Michelle Everest[1], Kim Thomaes[1], Rhonda Kersten[1], Stefan Everling[4], Stefan Treue[6], Wataru Inoue[4], Michael Poulter[1], Julio Martinez-Trujillo[4]

[1]Robarts Research Institute, [2]Schulich School of Medicine and Dentistry, [3]Columbia University, [4]University of Western Ontario, [5]Western University, [6]Leibniz-Institut fur Primatenforschung

3-B-25 ***Modelling and classification of travelling wave dynamics in the visual cortex***

Lawrence Oprea[1]

[1]McGill University

3-B-26 ***Glutamatergic synapse potentiation is associated with neuroendocrine sensitization to stress***

Julia Sunstrum[1], Eric Salter[2], Wataru Inoue[1]

[1]University of Western Ontario, [2]University of Toronto

3-B-27 ***Toward cellular-based explanations of LFP theta-gamma rhythm generation in the hippocampus***

Alexandra Chatzikalymniou[1], Frances Skinner[2]

[1]Krembil Discovery Tower, [2]Krembil Research Institute

3-B-28 ***Functional heterogeneity of human and mouse layer 5 pyramidal neurons***

Homeira Moradi-Chameh[1], Prajay Shah[1], Shreejoy Tripathy[2], Taufik Valiante[3]

[1]Krembil Research Institute, [2]University of Toronto, [3]Krembil research Institute, University Health Network

3-B-29 ***Sag is a major contributor to human pyramidal cell intrinsic diversity across cortical layers and between individuals***

Homeira Moradi Chameh[1], Lihua Wang[1], Alvin Lee[2], Bushra Shehzad[2], Liang Zhang[3], Peter Carlen[1], Shreejoy Tripathy[2], Taufik Valiante[4]

[1]Krembil Research Institute, [2]University of Toronto, [3]University Health Network, [4]Krembil research Institute, University Health Network

3-B-30 ***Presynaptic release probability scales with synapse size under basal conditions and during long-term potentiation***

Matthew MacDougall[1], Alan Fine[1]

[1]Dalhousie University

3-B-31 ***Microglia prefer interneurons: a structural analysis of microglia-interneuron interactions in the CA1 hippocampus***

Etienne Gervais[1], Ana Claudia Gonçalves Bessa[1], Lisa Topolnik[1]

[1]Université Laval

3-B-32 ***The C9orf72 repeat expansion associated with fronto-temporal dementia leads to synaptic dysfunction in hippocampal pyramidal neurons***

Alfonsa Zamora-Mortalla[1], Lisa Topolnik[1]

[1]Université Laval

3-B-33 ***Dopamine D2 receptor/voltage-gated sodium channel interaction regulates D2-driven signaling and behavior***

Gohar Fakhfouri[1], Pavel Powlowski[2], Clémentine Quintana[2], Mohamed Chahine[1], Jean-Martin Beaulieu[2], Giulio Pergola[3], Antonio Rampino[3], Jivan Khlghatyan[1], Thomas Del'Guidice[1]

[1]Université Laval, [2]University of Toronto, [3]University of Bari

3-B-34 ***Circadian rhythm of neuronal activity in vasopressin neurons of the suprachiasmatic nucleus in male and female rats.***

Zahra Thirouin[1], Claire Gizowski[2], Charles Bourque[2]

[1]Research Institute at McGill University Health Center, [2]McGill University

3-B-35 ***Transcriptomic correlates of electrophysiological and morphological diversity within and across neuron types***

Shreejoy Tripathy[1], Claire Bomkamp[2], Carolina Bengtsson Gonzales[3], Jens Hjerling-Leffler[3], Ann Marie Craig[2], Paul Pavlidis[2]

[1]University of Toronto, [2]University of British Columbia, [3]Karolinska Institute

3-B-36 ***Locus of potentiating effects of superoxide on synaptic plasticity***

Tatjana Golovin[1], Alan Fine[1]

[1]Dalhousie University

3-B-37 ***Identification of a complex containing OGT-1 O-GlcNAc transferase and EEL-1 ubiquitin ligase that regulates GABA neuron function***

Andrew Giles[1], Muriel Desbois[1], Karla Opperman[1], Rubens Tavora[2], Marissa Maroni[1], Brock Grill[1]

[1]The Scripps Research Institute - Scripps Florida, [2]Florida Atlantic University

3-B-38 ***Divergent roles of the Fragile X Mental Retardation protein (FMRP) in developmental remodeling of a central synapse***

Ankur Bodalia[1], Jason Arsenault[1], Lu-Yang Wang[1]

[1]The Hospital for Sick Children

3-B-39 ***Δ9-THC regulates MANF expression, but not cellular restoration through the CB1R***

William McIntyre[1], Judith Tran[1], Ram Mishra[1]

[1]McMaster University

3-B-40 ***GluN1 N1-cassette regulates glycine-primed internalization and NMDA channel activity in hippocampal CA1 pyramidal neurons***

Vishaal Rajani[1], Hongbin Li[1], Ameet Sengar[1], Danielle Chung[2], Lu Han[1], James Cooke[1], Michael Salter[1]

[1]The Hospital for Sick Children, [2]University of Toronto

3-B-41 ***A novel negative allosteric modulator (NAM) of the cannabinoid receptor 1 (CB1) as a potential therapeutic ligand for the treatment of psychiatric disorders arising from dopamine dysregulation***

Vincent Lam[1], Gemma Baillie[2], Iain Greig[3], Mostafa Abdelrahman[3], Laurent Trembleau[3], Ruth Ross[1]

[1]University of Toronto, [2]University of Dundee, [3]University of Aberdeen

3-B-42 ***NMDA receptor activation strengthens GABAergic signaling through a reactive oxygen species pathway***

Erik Larson[1], Michael Accardi[1], Martina D'Antoni[1], Derek Bowie[1]

[1]McGill University

3-B-43 ***Bringing CLARITY to injury-induced astroglial plasticity within the sensorimotor cortex: effects of dental pulpectomy versus tooth extraction***

Jacqueline Lopez Gross[1], Ryuta Akasaka[1], Maryam Zanjir[1], Caitlin Sherry[1], Imran Alidina[1], Bettina Basrani[1], Pavel Cherkas[1], Limor Avivi-Arber[1]

[1]University of Toronto

3-B-44 ***Microglia prevents white matter maturation delay induced by systemic inflammation in the developing cerebellum***

Sophie Tremblay[1], Alex Pai[1], Laurine Legroux[2], Dan Goldowitz[1]

[1]Centre for Molecular Medicine and Therapeutics, [2]CHU Sainte-Justine Research Center/Université de Montréal

3-B-45 ***GluN2 heterogeneity across individual primary afferent-lamina I neuron synapses differentially encodes sensory input in the adult rat lumbar spinal cord***

Graham Pitcher[1], Livia Garzia[2], Michael Taylor[1], Michael Salter[3]

[1]SickKids Research Institute, [2]McGill University, [3]The Hospital for Sick Children

3-B-46 ***Response properties from theta-burst stimulation of limbic structures in humans***

Chaim Katz[1], Kramay Patel[1], Taufik Valiante[2]

[1]University of Toronto, [2]Krembil research Institute, University Health Network

3-B-47 ***Alternative splicing of exon 5 in GluN1 controls glycine-stimulated recruitment of AP-2 to NMDA receptors***

Danielle Chung[1], Ameet Sengar[2], Michael Salter[2]

[1]University of Toronto, [2]The Hospital for Sick Children

3-B-48 ***Pannexin 1 regulates network ensembles and dendritic spine development in cortical neurons***

Juan Sanchez-Arias[1], Mei Liu[2], Catherine Choi[1], Sarah Ebert[1], Ana De Lucas-Rius[1], Craig Brown[1], Leigh Anne Swayne[1]

[1]University of Victoria, [2]Nantong University

3-B-49 ***Decreases in cellular firing dominate within the perisacaddic interval in human mesial temporal lobe structures and occipital lobe***

Andrea Schjetnan[1], Chaim Katz[2], Kramay Patel[2], Victoria Barkley[1], Taufik Valiante[3]

[1]Toronto Western Hospital, UHN, [2]University of Toronto, [3]Krembil research Institute, University Health Network

3-B-50 ***Stress modulates the plasticity of glutamate synapses in the dorsomedial hypothalamus in rats***

Karen Crosby[1], Tenea Welsh[1]

[1]Mount Allison University

3-B-51 ***A recurrent network motif in the dorsal raphe nucleus supports an operational classification of habenula inputs***

Michael Lynn[1], Sean Geddes[1], Mohamad Chahrour[1], Sebastien Maillé[1], Emerson Harkin[1], Samir Haj-Dahmane[2], Richard Naud[1], Jean-Claude Beique[1]

[1]University of Ottawa, [2]University at Buffalo, State University of New York

3-B-52 ***Spinal DNA methylome and transcriptome signature after peripheral nerve injury (PNI)***

Shahrzad Ghazisaeidi[1], Parisa Shooshtari[2], Arun Ramani[2], Amy Tu[2], Katherine Halievski[2], David Finn[3], Sofia Assi[1], Milind Muley[2], Vivian Wang[2], Ameet Sengar[2], Rosanna Weksberg[2], Michael Brudno[2], Michael Salter[2]

[1]University of Toronto, [2]The Hospital for Sick Children, [3]National University of Ireland

3-B-54 ***Impact of optogenetic perturbation of phospholipids on release and replenishment of synaptic vesicles in central nerve terminals***

Shuwen Chang[1], Lu-Yang Wang[1]

[1]The Hospital for Sick Children

3-B-55 ***Pannexin1 channels and dopamine receptor signaling; old players and new prospects***

Nickie Safarian[1], Paige Whyte-Fagundes[1], Christiane Zoidl[1], Joerg Grigull[1], Georg Zoidl[1]

[1]York University

3-B-56 ***Frequency-dependent coupling between neuronal activity and mitochondrial Ca2+ dynamics in situ***

Chris Groten[1], Brian MacVicar[1]

[1]University of British Columbia

3-B-57 Enhanced LTP in mice lacking the endogenous cellular prion protein

Aeen Ebrahim Amini[1], John Georgiou[2], Changiz Taghibiglou[3], Graham Collingridge[1]

[1]University of Toronto, [2]Lunenfeld-Tanenbaum Research Institute, Mt. Sinai Hospital, [3]University of Saskatchewan

3-B-58 ***Ankyrin-B p.S646F increases the intracellular pool of Cav2.1***

Catherine Choi[1], Ivana Souza[2], Juan Sanchez-Arias[1], Gerald Zamponi[2], Laura Arbour[3], Leigh Anne Swayne[1]

[1]University of Victoria, [2]University of Calgary, [3]University of British Columbia

3-B-59 ***A role for glycogen synthase kinase-3β as a regulator of prefrontal cortical and hippocampal neuronal oscillations in cognition***

Abdalla Albeely[1], Melissa Perreault[1]

[1]University of guelph

C - Disorders of the nervous system

3-C-60 ***Synaptic Modifications Induced by Starvation at Drosophila Neuromuscular Junctions (NMJ)***

Gretchen Macias-Mendez[1], Ramon Jorquera[1]

[1]Universidad Central del Caribe

3-C-61 ***Mitochondrial function and antioxidant mechanisms of astrocytes in fragile X syndrome***

Gregory Vandenberg[1], Alison Head[1], Neal Dawson[1], Angela Scott[1]

[1]McMaster University

3-C-62 ***Chemotherapeutic ablation of seizure-induced neurogenesis attenuates cognitive impairments after long-term amygdala kindling***

Travis Francis[1], Brady Reive[1], Hugo Lehmann[1], Neil Fournier[1]

[1]Trent University

3-C-63 ***Dickkopf-related protein 1 (DKK1) inhibition attenuates Amyloid-beta (Aβ)-related pathology in APP/PS1 mice***

Romain Menet[1], Maxime Bernard[1], Sarah Lecordier[1], Philippe Bourassa[1], Frédéric Calon[1], Ayman ElAli[1]

[1]Université Laval

3-C-64 ***Combined rapid amygdaloid kindling and corticosterone treatment induces anxious depression in rats***

Brady Reive[1], Travis Francis[1], Neil Fournier[1]

[1]Trent University

3-C-65 ***Circadian regulation of the RNA binding protein FXR1***

Tiago Silva[1], Alesya Evstratova[1], Aleksandra Marakhovskaia[1], Valerie Mongrain[2], Jean-Martin Beaulieu[1]

[1]University of Toronto, [2]Université de Montréal

3-C-66 ***FABP 5 gene ablation promotes resilience to stress reinstatement for cocaine seeking behavior in mice***

John Hamilton[1], Matthew Marion[1], Antonio Figueiredo[1], Eleftherios Hetelekides[1], Amanda Nubelo[1], Meagan Schreiner[1], Rylee Haffey[1], Nicole Roeder[1], Carly Connor[1], Panayotis Thanos[1]

[1]Jacobs School of Medicine, University at Buffalo

3-C-67 ***Using eye tracking to identify saccade biomarkers of neurodegenerative disease***

Heidi Riek[1], Brian Coe[1], Don Brien[1], Sandra Black[2], Michael Borrie[3], Dar Dowlatshahi[4], Elizabeth Finger[3], Morris Freedman[5], David Grimes[4], Donna Kwan[6], Anthony Lang[7], Connie Marras[7], Mario Masellis[2], Gustavo Saposnik[8], Rick Swartz[2], Carmela Tartaglia[7], Lorne Zinman[2], ONDRI Investigators[6], Douglas Munoz[1]

[1]Queen's University, [2]Sunnybrook Research Institute, [3]Western University, [4]University of Ottawa, [5]Baycrest Health Sciences, Rotman Research Institute, [6]Ontario Neurodegenerative Disease Research Initiative, [7]Toronto Western Hospital, [8]St Michael's Hospital

3-C-68 ***Using eye tracking to identify biomarkers of eating disorders in adolescents***

Ryan Kirkpatrick[1], Linda Booij[2], Sarosh Khalid-Khan[1], Douglas Munoz[1]

[1]Queen's University, [2]Concordia University

3-C-69 ***Gene therapy for rescuing epilepsy in Dravet Syndrome***

Yosuke Niibori[1], Shiron Lee[1], David Hampson[1]

[1]University of Toronto

3-C-70 ***The effects of tp5, a cdk5/p25 inhibitor, in human neuroblastoma cell line and c. elegans models of parkinson's disease***

Judith Tran[1], Anika Gupta[1], Harish Pant[2], Bhagwati Gupta[1], Ram Mishra[1]

[1]McMaster University, [2]NIH

3-C-71 ***Increased neocortical epileptogenicity in a mouse model of neurofibromatosis type 1***

Azadeh Sabetghadam[1], Chiping Wu[2], Jackie Liu[2], Hongmei Song[2], Liang Zhang[2], Aylin Reid[2]

[1]UHN, [2]University Health Network

3-C-72 ***Targeting the early and late step of cholesterol biosynthesis pathway to promote neuronal regeneration following optic nerve injury***

Alireza Shabanzadeh Pirsaraei[1], Paulo D. Koeberle[1], Philippe P. Monnier[2]

[1]University of Toronto, [2]Krembil Research Institute/University of Toronto

3-C-73 ***Investigating the neural basis of conditioned analgesia in chronic neuropathic pain***

Chulmin Cho[1], Vassilia Michailidis[1], Batul Presswala[1], Natalia Dziekonski[1], Hyun Been Park[1], Loren Martin[2]

[1]University of Toronto, [2]University of Toronto Mississauga

3-C-74 ***Glutamate and GABAergic receptor function in post-concussion syndrome as measured by transcranial magnetic stimulation***

Mitchell Locke[1], Claudia Turco[1], Michel Rathbone[1], Michael Noseworthy[1], Aimee Nelson[1]

[1]McMaster University

3-C-75 ***ATF4 mediates amyloid beta-induced neuronal death***

Gillian Petroff[1], Sean Cregan[2]

[1]Western University/Robarts Research Institute, [2]University of Western Ontario

3-C-76 ***Analyzing the electrophysiological effects of Rett Syndrome on neuronal network development using machine learning***

Milad Khaki[1], Kartik Pradeepan[2], Julio Martinez-Trujillo[3]

[1]Robarts Research Institute, [2]Robarts Research Institute, University of Western Ontario, [3]University of Western Ontario

3-C-77 ***Altered connectivity in Rett syndrome human stem cell-derived neural networks***

Rebecca Mok[1], Lyndon Duong[2], Wei Wei[1], Alina Piekna[1], Peter Pasceri[1], Julio Martinez-Trujillo[3], James Ellis[1]

[1]The Hospital for Sick Children, [2]Robarts Research Institute, [3]University of Western Ontario

3-C-78 ***Neuro-immune control of post-operative pain via CCR4***

Jaqueline Silva[1], Courtney Bannerman[1], Julia Segal[1], Francisco Gomes[2], Thiago Cunha[2], Ian Gilron[1], Nader Ghasemlou[1]

[1]Queen's University, [2]University of Sao Paulo

3-C-79 ***Neuroprotective effect of H2 and H3 relaxins in cultured brain slices deprived of oxygen and glucose***

Brian Wilson[1], Angela Kaiser[1], Nicholas DeAdder[1]

[1]Acadia University

3-C-80 ***Fxr1 and mitochondrial function: potential relevance for bipolar disorder***

Aleksandra Marakhovskaia[1], Gianluca Ursini[2], Abbie Wu[1], Jivan Khlghatyan[3], Ana Andreazza[1], Jean Martin Beaulieu[1]

[1]University of Toronto, [2]Lieber Institute for Brain Development, [3]Université Laval

3-C-81 ***Specifically targeting ERK signaling ameliorates core deficits in mouse models of autism***

Elizabeth Hughes[1], Maryam Khanbabaei[1], Kartikeya Murari[1], Ray Turner[1], Jong Rho[1], Ning Cheng[1]

[1]University of Calgary

3-C-82 ***Immune modulating peptide for the suppression of autoimmune cells in Multiple Sclerosis***

Karin Rustad[1], Alexandria Ripplinger[1], Michael Levin[2], Josef Buttigieg[1]

[1]University of Regina, [2]University of Saskatchewan

3-C-83 ***Does voluntary running reduce aberrant seizure-induced hippocampal neurogenesis and improve cognitive behaviours in PTZ kindled rats?***

Kaylea Post[1], Madeline Gilchrist[1], Chantel Cole[1], Lianne Brandt[1], Hugo Lehmann[1], Neil Fournier[1]

[1]Trent University

3-C-84 ***The role of inflammation in the development of behavioral changes after traumatic brain injury***

Yuqi Lin[1], Chiping Wu[2], Jackie Liu[2], Aylin Reid[2]

[1]University of Toronto, [2]University Health Network

3-C-85 ***Viral knockdown of alpha-synuclein expression prevents spreading synucleinopathy***

Sindhu Menon[1], Fadl Nabbouh[1], Kristiana Xhima[1], Pablo Sardi[2], Lamya Shihabuddin[2], Howard Mount[1], Isabelle Aubert[3], Joel Watts[1], Anurag Tandon[1]

[1]University of Toronto, [2]Sanofi-Genzyme, [3]Sunnybrook Research Institute

3-C-86 ***The pre-symptomatic changes of spinal interneurons in a mouse model of amyotrophic lateral sclerosis.***

Laura Bennett[1], Joanna Borowska[1], Dylan Deska-Gauthier[1], Dallas Bennett[1], Ying Zhang[1]

[1]Dalhousie University

3-C-87 ***Molecular mechanisms regulating Ca2+ increase in pericytes leading to capillary constriction***

Deborah Villafranca-Baughman[1], Luis Alarcon-Martinez[1], Florence Dotigny[1], Adriana Di Polo[2]

[1]CRCHUM - Université de Montréal, [2]University of Montreal Hospital Research Center

3-C-88 ***Antibiotic treatment slows recovery of mechanical hypersensitivity for males but not females in a hindpaw incision model of pain***

Katherine Halievski[1], Michael Salter[1]

[1]The Hospital for Sick Children

3-C-89 ***Neuroligin 1 is altered by amyloid-beta oligomers and modulates their toxicity***

Julien Dufort-Gervais[1], Chloé Provost[1], Laurence Charbonneau[1], Christopher Norris[2], Frédéric Calon[3], Valerie Mongrain[4], Jonathan Brouillette[1]

[1]Hôpital du Sacré-Coeur de Montréal, [2]University of Kentucky, [3]Université Laval, [4]Université de Montréal

3-C-90 ***Identifying neurons active in the motor cortex when performing behavioral tasks during stroke recovery***

Damian Chwastek[1], Yingben Xue[1], Greg Silasi[1], Diane Lagace[1]

[1]University of Ottawa

3-C-91 ***Robotic assessment of upper limb function in a non-human primate model of chronic stroke***

Yining Chen[1], Bruno Cohen[1], Joseph Nashed[1], Douglas Cook[1]

[1]Queen's University

3-C-92 ***Investigating the role of RGM family and their receptor neogenin on multiple sclerosis through experimental autoimmune encephalomyelitis***

Seunggi Lee[1], Philippe Monnier[1]

[1]University of Toronto

3-C-93 ***Role of interleukin-1β in the development of pain hypersensitivity in a model of non-compressive disc herniation***

Milind Muley[1], Yu Shan Tu[2], Benjamin Steinberg[2], Michael Salter[1]

[1]The Hospital for Sick Children, [2]Research Institute at The Hospital for Sick Children (SickKids)

3-C-94 ***A longitudinal analysis of depression and anxiety in Parkinson's disease***

Margaret Prenger[1], Nicholas Handfield-Jones[1], Penny MacDonald[1]

[1]University of Western Ontario

3-C-96 ***Selective knockout of amyloidogenic regions in SOD1 modulate its aggregation and toxicity in living cells***

Jeremy Nan[1], Luke McAlary[2], Neil Cashman[3]

[1]University of British Columbia, [2]University of Wollongong, [3]University of British Columbia, Djavad Mowafaghian Centre for Brain Health

3-C-97 ***Motor impairment in mice with a gain-of-function mutation in retinoic acid receptor beta (RARB).***

Nicolas Lemmetti[1], Christina Nassif[1]

[1]CHU Sainte-Justine Research Center/Université de Montréal

3-C-99 ***Assessing the effect of one minimal dose of risperidone vs olanzapine on the drive to play extraordinary social roles associated with disorganization***

Ilya Demchenko[1], Gifty Asare[2], Efthymios Hadjis[1], Ola Mohamed Ali[1], J. Bruno Debruille[1]

[1]McGill University, [2]York University

3-C-100 ***Investigating the therapeutic role of CDNF and MANF upon Lurasidone treatment in a MK-801 model of schizophrenia***

Brendan Fera[1], Todd Hoare[1], Ram Mishra[1]

[1]McMaster University

3-C-101 ***Activation of choroid plexus transient receptor potential vanilloid channel-4 channels stimulates brain EGF secretion and recovery***

Anil Zechariah[1], Marco Prado[1], Rithwik Ramachandran[1]

[1]University of Western Ontario

3-C-102 ***Effects of repeated awake closed head injury on cell proliferation and neurogenesis in juvenile rats***

Katie Neale[1], Hannah Reid[1], Barbara Sousa[1], Brian R Christie[1]

[1]University of Victoria

3-C-103 ***Association between depression severity and hippocampal volumes in Vietnam war veterans with PTSD, TBI, both or neither***

An Li[1], Sonja Stojanovski[1], Arielle Levy[1], Gabriel Devenyi[2], Mallar Chakravarty[2], Anne Wheeler[1]

[1]The Hospital for Sick Children, [2]Douglas Institute, McGill University

3-C-104 ***Transplantation of human spinal oligodendrogenic neural progenitor cells enhances remyelination and functional recovery after traumatic spinal cord injury***

Mohamad Khazaei[1], Christopher Ahuja[1], Hiroaki Nakashima[1], Narihito Nagoshi[1], Michael Fehlings[2]

[1]University Health Network, [2]University of Toronto

3-C-105 ***A self-assembling peptide biomaterial to optimize human neural stem cell-based regeneration of the injured spinal cord***

Christopher Ahuja[1], Mohamad Khazaei[1], Zijian Lou[2], Yao Yao[2], Ali Hasan[2], Vjura Senthilnathan[2], Inaara Walji[2], William Luong[2], Alexander Post[2], Gokce Ozdemir[2], Edward Robinson[2], Priscilla Chan[2], Jian Wang[2], Michael Fehlings[2]

[1]University Health Network, [2]University of Toronto

3-C-106 ***OPTOGENETIC-mediated spatiotemporal control of protein aggregation to study***

Morgan Bérard[1], Abid Oueslati[2]

[1]CHUL, [2]Université Laval & CHU de Québec Research Center, Neuroscience Axis

3-C-107 ***The adaptor protein p66Shc regulates CNS cell metabolism and redox state via the KEAP1-Nrf2 axis***

Asad Lone[1], Robert Cumming[1]

[1]University of Western Ontario

3-C-108 ***Dynamic networks of EEG sources enhance localization of the epileptogenic zone***

Daniel Jacobs[1], Jose Martin del Campo[2], Peter Carlen[3], Yotin Chinvarun[4], Berj Bardakjian[1]

[1]University of Toronto, [2]Toronto Western Hospital, [3]Krembil Research Institute, [4]Phramongkutklao Hospital

3-C-109 ***Expression profile of angiogenic factors and their role in Amyotrophic Lateral Sclerosis (ALS) disease pathology***

Akshay Anand[1], Shweta Modgil[1], Radhika Sharma[1], Abha Tiwari[1], Kaushal Sharma[1]

[1]Postgraduate Institute of Medical Education and Research

3-C-110 ***Plasma and cerebrospinal fluid (CSF) levels of marker proteins in Amyotrophic Lateral Sclerosis (ALS) patients.***

Shweta Modgil[1], Radhika Khosla[1], Abha Tiwari[1], Akshay Anand[1]

[1]Postgraduate Institute of Medical Education and Research

3-C-111 ***Study of handwriting on a graphic tablet for the aid of early diagnosis of Alzheimer's disease in a Moroccan population***

Aboulem Ghita[1]

[1]Service de Neurologie, Centre Hospitalier Universitaire Hassan II-Fès

3-C-112 ***Increased expression of schizophrenia-associated gene C4 leads to miswiring of prefrontal cortex and reduced social interaction***

Tushare Jinadasa[1], Ashley Comer[1], Lisa Kretsge[1], Thanh Nguyen[1], Jung Joon Lee[1], Elena Newmark[1], Frances Hausmann[1], SaraAnn Rosenthal[1], Kevin Lui Kot[1], William W. Yen[1], Alberto Cruz-Martin[1]

[1]Boston University

3-C-113 ***Elevated thalamo-cortical coupling in Parkinson's disease detected with magnetoencephalography***

Robin Cash[1], Ke Zeng[2], Matt Brown[3], Robert Chen[4]

[1]Monash University, [2]University Health Network, [3]California State University, [4]Krembil Brain Institute

3-C-114 ***Differentiating the substantia nigra pars compacta and ventral tegmental area in early-stage Parkinson's disease using quantitative susceptibility mapping***

Erind Alushaj[1], Nicholas Handfield-Jones[1], Adrian Owen[1], Ali Khan[1], Penny MacDonald[1]

[1]University of Western Ontario

3-C-115 ***The role of the Interleukin-1 system in alcohol-induced cortical dysfunction***

Florence Varodayan[1], Amanda Pahng[2], Tony Davis[3], Tali Nadav[1], Michal Bajo[1], Michael Burkart[3], Scott Edwards[2], Amanda Roberts[1], Marisa Roberto[1]

[1]The Scripps Research Institute, [2]Louisiana State University Health Sciences Center, [3]University of California, San Diego

3-C-116 ***Oxytocin normalizes altered social circuit connectivity in the Cntnap2 knockout mouse***

Katrina Choe[1], Martin Safrin[1], Richard Bethlehem[2], Neil Harris[1], Daniel Geschwind[1]

[1]University of California, Los Angeles, [2]University of Cambridge

3-C-117 ***Beneficial effects of ketogenic and beta-hydroxybutyrate diets on socio-cognitive deficits and glucose metabolism in NMDA receptor deficient mice***

Tatiana Lipina[1], Laura Pepera[1], Amy Ramsey[1]

[1]University of Toronto

3-C-118 ***A mechanism for spatially and temporally varying neuronal responses to static, spatially varying stimuli***

Jason Pina[1], Bard Ermentrout[1]

[1]York University

D - Sensory and motor systems

3-D-119 ***Alpha-lipoic acid mitigates toxic-induced demyelination in the corpus callosum by lessening of oxidative stress and stimulation of polydendrocytes proliferation***

Mehdi Mehdizadeh[1]

[1]Cellular and Molecular Research Center, Faculty of Medicine, Iran University of Medical Sciences

3-D-120 ***Cortical adaptation to limb effector constraints regarding affordance motor action priming***

Stevie Foglia[1], Kumar Somasundram[1], Jim Lyons[1]

[1]McMaster University

3-D-121 ***Fine orientation processing in the tactile periphery***

Vaishnavi Sukumar[1], J Andrew Pruszynski[1]

[1]University of Western Ontario

3-D-122 ***Neocortical inhibitory interneuron subtypes display distinct responses to rate and synchrony of spiking activity***

Matthew Tran[1], Luke Prince[1], Dorian Grey[2], Lydia Saad[1], Helen Chasiotis[2], Blake Richards[1]

[1]University of Toronto, [2]University of Toronto Scarborough

3-D-123 ***Decoding eye-head-hand coordination in primate premotor cortex during visually guided reaches.***

Veronica Nacher[1], Harbandhan Arora[1], Vishal Bharmauria[1], Xiao Yan[1], Saihong Sun[1], Hongying Wang[1], John Douglas Crawford[1]

[1]York University

3-D-124 ***Classifying interneurons based upon responses to top-down feedback in the barrel cortex***

Lydia Saad[1], Dorian Grey[2], Helen Chasiotis[2], Matthew Tran[1], Blake Richards[1]

[1]University of Toronto, [2]University of Toronto Scarborough

3-D-125 ***Maturation of grasping through increased presynaptic inhibition of sensory feedback to di3 interneurons***

Nicolas Lalonde[1], Carl Farah[1], Tuan Bui[1]

[1]University of Ottawa

3-D-126 ***GABA concentration in the auditory cortex and aging-related decline in speech-in-noise understanding***

Simon Dobri[1], Bernhard Ross[1]

[1]University of Toronto, Rotman Research Institute

3-D-127 ***The effect of visual conditioning on cortical map plasticity: a wide-field calcium imaging study***

Guillaume Laliberté[1], Elvire Vaucher[1]

[1]Université de Montréal - Laboratoire Vaucher

3-D-128 ***Gain scaling adaptation in vestibular thalamus***

Graham McAllister[1], Jerome Carriot[1], Jessica Brooks[1], Hamed Hooshangnejad[2], Kathleen Cullen[2], Maurice Chacron[1]

[1]McGill University, [2]Johns Hopkins University

3-D-129 ***Thalamus coding strategies for representing natural self-motion***

Jerome Carriot[1], Hamed Hooshangnejab[2], Graham McAllister[1], Isabelle Mackrous[1], Kathleen Cullen[2], Maurice Chacron[1]

[1]McGill University, [2]Johns Hopkins University

3-D-130 ***Re-evaluation of luminance evoked pupil response dynamics***

Jonathan Coutinho[1], Douglas Munoz[1], Gunnar Blohm[2]

[1]Queen's University, [2]Center for Neuroscience Studies, Queen's University

3-D-131 ***The functional role of enhancing the activity and survival of progenitor cells during stroke recovery***

Sebastien Denize[1], Maheen Ceizar[1], Yingben Xue[1], Diane Lagace[1]

[1]University of Ottawa

3-D-132 ***Neural population level noise correlations across three parallel topographic maps in the electrosensory system of Apteronotus leptorhynchus during prey localization***

Myriah Haggard[1], Maurice Chacron[1]

[1]McGill University

3-D-133 ***Reliability and smallest detectable change of short- and long-latency afferent inhibition***

Claudia Turco[1], Angelina Pesevski[1], Paul McNicholas[1], Louis-David Beaulieu[2], Aimee Nelson[1]

[1]McMaster University, [2]Université du Québec à Chicoutimi

3-D-134 ***Population coding in central vestibular pathways during naturalistic stimuli***

Mohammad Mohammadi[1], Mohammad Mohammadi[1], Isabelle Mackrous[1], Jerome Carriot[1], Kathleen Cullen[2], Maurice Chacron[1]

[1]McGill University, [2]Johns Hopkins University

3-D-135 ***Coding of saccade targets in primate hippocampus. A comparison with the lateral prefrontal cortex***

Ben Corrigan[1], Roberto Gulli[2], Guillaume Doucet[3], Julio Martinez-Trujillo[1]

[1]University of Western Ontario, [2]Columbia University, [3]Ottawa Hospital Research Institute

3-D-136 ***Postural state modulation of cortical activity associated with balance reactions***

Mark Laylor[1], Paula Polastri[2], Jessy Varghese[1], William McIlroy[1]

[1]University of Waterloo, [2]Sao Paula State University

3-D-137 ***An algorithmic impediment to understanding neural circuits via circuit interrogation***

Venkatakrishnan Ramaswamy[1]

[1]National Centre for Biological Sciences

3-D-138 ***Genital stimulation facilitates a sexual reward state in male and female mice***

Thanh Phung[1], Firyal Ramzan[2], Ashley Monks[2]

[1]University of Toronto, [2]University of Toronto Mississauga

3-D-139 ***Saphenous nerve ligation elicits widespread alterations in cortical dynamics***

Donovan Ashby[1], Jeffery LeDue[2], Timothy Murphy[2], Alexander McGirr[1]

[1]University of Calgary, [2]University of British Columbia

3-D-140 ***Investigating delayed motor learning of 16p11.2+/- mouse model of autism via in vivo two-photon imaging***

Xuming Yin[1], Nabil Asraoui[1], Marie-Eve Mathieu[1], Nathaniel Jones[1], Simon Chen[1]

[1]University of Ottawa

3-D-141 ***Characterization of the role of dorsal horn calretinin-expressing interneurons to the processing of pain inputs***

Hugues Petitjean[1], Farin B. Bourojeni[2], Deborah Tsao[1], Davidova Albena[1], Susana G. Sotocina[1], Jeffrey S. Mogil[1], Artur Kania[2], Reza Sharif-Naeini[1]

[1]McGill University, [2]Institut de Recherches Cliniques de Montréal

E - Homeostatic and neuroendocrine systems

3-E-142 ***Neural mechanisms of multiplexed egocentric and allocentric gaze coding in monkey frontal eye fields***

Vishal Bharmauria[1], Amirsaman Sajad[2], Xiaogang Yan[1], Hongying Wang[1], John Douglas Crawford[1]

[1]York University, [2]Vanderbilt University

3-E-143 ***Glucocorticoid regulation of the G-protein Coupled Estrogen Receptor (GPER) protein expression and signalling in immortalized hippocampal neurons***

Kate Nicholson[1], Ari Mendell[1], Carolyn Creighton[1], Neil MacLusky[1]

[1]University of Guelph

3-E-144 ***Time course of surgical stress and the role of testosterone in the post-operative recovery of hippocampal and medial prefrontal cortex dendritic morphology in adult male rats.***

Lauren Isaacs[1], Eric Lawton[1], Ari Mendell[1], Neil MacLusky[1]

[1]University of Guelph

3-E-145 ***Immunohistochemical analysis and atlas mapping of hypothalamic neurons that coexpress tyrosine hydroxylase and the vesicular GABA transporter.***

Kayla Schumacker[1], Rebecca Butler[1], Kenichiro Negishi[2], Mikayla Payant[1], Gabor Wittman[3], Arshad Khan[2], Melissa Chee[1]

[1]Carleton University, [2]University of Texas at El Paso, [3]Tufts Medical School

3-E-146 ***Exposure to the synthetic glucocorticoid dexamethasone downregulates DUSP6 and alters expression of neurological disorder-related genes***

Emily Craig[1], Kate Nicholson[1], Neil MacLusky[1]

[1]University of Guelph

3-E-147 ***Prostaglandin E2 activates corticotropin releasing hormone neurons in the paraventricular nucleus of the hypothalamus.***

Hiroyuki Igarashi[1], Eric Kuebler[2], Julio Martinez-Trujillo[1], Wataru Inoue[1]

[1]University of Western Ontario, [2]Robarts Research Institute

3-E-148 ***GHSR signaling in the DMH and its effects on energy homeostasis***

Lindsay Hyland[1], Stephanie DeSante[1], Alex Wiseman[1], Su-Bin Park[1], Alexander Edwards[1], Yosra Abdelaziz[1], Barbara Woodside[2], Alfonso Abizaid[1]

[1]Carleton University, [2]Concordia University

3-E-149 ***Fear and anxiety in the hypothalamus***

Tamás Füzesi[1], David Rosenegger[1], Nuria Daviu[1], Neilen Rasiah[1], Govind Peringod[1], Taylor Chomiak[1], Leonardo Molina[1], Grant Gordon[2], Jaideep Bains[1]

[1]Hotchkiss Brain Institute, [2]University of Calgary

F - Cognition and behavior

3-F-150 ***Cuticular hydrocarbons confer desiccation resistance in D. melanogaster***

Kamar Nayal[1], Joshua Krupp[1], Amy Wong[1], Jocelyn Millar[2], Joel Levine[1]

[1]University of Toronto, [2]University of California

3-F-151 ***Failure of NMDA receptor restoration to serotonin and dopamine cells to improve schizophrenia-like behaviour of GluN1KD mice***

Katheron Intson[1], Maliha Zaman[1], Ali Salahpour[1], Amy Ramsey[1]

[1]University of Toronto

3-F-152 ***The memories that linger: the effect of opiate withdrawal and conditioned opiate withdrawal on memory consolidation***

Nana Baidoo[1], Michael Wolter[1], Francesco Leri[1], Boyer Winters[1]

[1]University of Guelph

3-F-153 ***The fate of an engram supporting a conditioned fear memory***

Sungmo Park[1], Paul W. Frankland[1], Sheena A. Josselyn[1]

[1]The Hospital for Sick Children

3-F-154 ***Characterizing the role of the marmoset posterior parietal cortex in saccade generation***

Maryam Ghahremani[1], Kevin Johnston[2], Lauren Schaeffer[2], Stefan Everling[2]

[1]Robarts Research Institute, University of Western Ontario, [2]University of Western Ontario

3-F-155 ***Identification of functional role of medial prefrontal cortical neurons co-expressing D1 and D2 receptors***

Clémentine Quintana[1], Jean-Martin Beaulieu[1]

[1]University of Toronto

3-F-157 ***Effects of a maternal high-fat diet during pregnancy on working memory and it´s relation with serum glutathione levels in the Wistar rat pups***

Nadia Cortés-Alvarez[1], César Vuelvas-Olmos[1], Maria Pinto-González[1], Ricardo Pedraza-Medina[1], Jorge Guzmán-Muñiz[1], Jorge Collás-Aguilar[1], Norma Moy-Lopéz[1], Luz Baltazar-Rodriguez[1]

[1]University of Colima

3-F-158 ***Effects of contact sports practice on a computerized cognitive assessment in collegiate contact sport athletes***

César Vuelvas-Olmos[1], Nadia Cortés-Alvarez[1], Pedro Flores-Moreno[1], Jorge Guzmán-Muñiz[1], Norma Moy-Lopéz[1], Fabián Rojas-Larios[1]

[1]University of Colima

3-F-159 ***Dissociable mitogen activated protein kinase pathways in the ventral hippocampus underlie delta-9-tetrahydrocannabinol-induced dysregulation of prefrontal cortical neural activity and cognitive deficits***

Roger Hudson[1], Tony Jung[2], Tya Vine[1], Walter Rushlow[1], Steven Laviolette[1]

[1]University of Western Ontario, [2]Western University

3-F-160 ***Imaging neuronal allocation to an episodic-like memory in the rodent hippocampus***

Andrew Mocle[1], Adam Ramsaran[1], Blake Richards[1], Paul Frankland[1], Sheena Josselyn[1]

[1]University of Toronto

3-F-161 ***Morphometric and spine density analysis of pyramidal neurons in a mouse model of sporadic Alzheimer's disease***

Rasha Mehder[1], Brian Bennett[1], R. David Andrew[1]

[1]Queen's University

3-F-162 ***Effects of levodopa on craving for alcohol in abstinent alcoholics***

Kathryne (Kasey) Van Hedger[1], Nole Hiebert[1], Ivan Witt[1], Ken Seergobin[1], Penny MacDonald[1]

[1]University of Western Ontario

3-F-163 ***Determining parameters for safer therapeutic deep brain stimulation that preserves healthy medial temporal lobe network function and memory***

Mary McIntosh[1], Ron Levy[1]

[1]Queen's University

3-F-164 ***Structural brain differences between cognitively impaired patients with and without apathy***

Nathan Chan[1], Philip Gerretsen[2], Daniel Blumberger[2], Fernando Caravaggio[2], Eric Brown[1], Ariel Graff-Guerrero[2]

[1]University of Toronto, [2]Centre for Addiction and Mental Health

3-F-165 ***Goal states modulate the outcome of cortical stimulation***

Becket Ebitz[1], Tirin Moore[2], Benjamin Hayden[1]

[1]University of Minnesota, [2]Stanford University and Howard Hughes Medical Institute

3-F-166 ***L-dopa alters brain activity associated with regularity detection***

Abdullah Al Jaja[1], Nole Hiebert[2], Bjorn Herrmann[1], Ken Seergobin[2], Jessica Grahn[1], Penny MacDonald[2]

[1]Brain and Mind Institute/ Western University, [2]University of Western Ontario

3-F-167 ***Neural bases of note normalization in absolute pitch***

Stephen Van Hedger[1], Shannon Heald[2], Howard Nusbaum[2]

[1]Western University, [2]University of Chicago

3-F-168 ***Cannabinoid receptor expression in a model of addiction vulnerability***

Ali Gheidi[1], Lora Cope[1], Christopher Fitzpatrick[1], Claire Barcelo[1], Jonathan Morrow[1]

[1]University of Michigan

3-F-169 ***Ultra-rapid formation of event associations in single neurons in the medial prefrontal cortex***

Kaori Takehara-Nishiuchi[1], Maryna Pilkiw[1], Mark Morrissey[1]

[1]University of Toronto

3-F-170 ***An isolated brief seizure produces robust deficits in trace fear learning***

Teresa Ann-Maletta[1], Emily Horsey[1], Lianne Brandt[1], Neil Fournier[1]

[1]Trent University

3-F-171 ***Automated touchscreen tasks reveal early cognitive dysfunction caused by mutant TDP-43 in an FTD/ALS mouse model***

Keon Coleman[1], Roseane Franco[1], Matthew Cowan[1], Julliane Joviano-Santos[1], Jane Rylett[1], Vania Prado[1], Lisa Saksida[1], Marco Prado[1], Timothy Bussey[1], Flavio Beraldo[1]

[1]University of Western Ontario

3-F-172 ***Neuroprotective role of L-theanine on a schizophrenia-like phenotype induced by chronic adolescent THC exposure***

Marta De Felice[1], Justine Renard[1], Hanna Szkudlarek[1], Roger Hudson[1], Brian Pereira[1], Susanne Schmid[1], Walter Rushlow[1], Steven Laviolette[1]

[1]University of Western Ontario

3-F-173 ***Psychopathic traits modulate functional connectivity metrics of drug- and food-reactivity in both dependent and non-dependent participants***

William Denomme[1], Matthew Shane[1]

[1]University of Ontario Institute of Technology

3-F-174 ***Transient cholinergic signal during aversive events modulate prefrontal network state during memory encoding***

Gaqi Tu[1], Samuel Gillman[1], Xiaotian Yu[1], Kaori Takehara-Nishiuchi[1]

[1]University of Toronto

3-F-175 ***Systems consolidation impairs behavioural flexibility***

Sankirthana Sathiyakumar[1], Blake Richards[1]

[1]University of Toronto

3-F-176 ***Genetically-predicted DRD4 gene expression in frontal cortex is associated with sex and SES differential expression of impulsivity and sugar intake***

Afroditi Papantoni[1], Andre Portella[2], Robert Levitan[3], Patricia Silveira[2], Susan Carnell[1], Laurette Dube[2]

[1]Johns Hopkins University, [2]McGill University, [3]University of Toronto

3-F-177 ***Motivation and executive functions, craving, and snacking behavior: an experience-sampling comparison between restrained and unrestrained eaters***

Ji Lu[1], Laurette Dube[2]

[1]Dalhousie University, [2]McGill University

3-F-178 ***Characterizing neurogenesis-mediated forgetting in the water maze paradigm***

Chunan Duan[1], Lina Tran[2], Sheena Josselyn[1], Paul Frankland[1]

[1]University of Toronto, [2]The Hospital for Sick Children

3-F-179 ***Neurochemical and behavioural effects of stage-dependent ethanol exposure on novel tank response in juvenile zebrafish***

Celine Bailleul[1], Samuel Nguyen[1], Amanda Facciol[1], Robert Gerlai[2]

[1]University of Toronto Mississauga, [2]University of Toronto

3-F-180 ***Virtually-simulated exchange of social touch between humans interacting as avatars hinders interpersonal affiliation***

Garima Saini[1], Marigrace Noronha[1], Anna Lomanowska[1]

[1]University of Toronto Mississauga

3-F-181 ***Dissociable effects of tetrahydrocannabinol and cannabidiol on prefrontal cortex-dependent executive function and affective processing***

Hanna Szkudlarek[1], Sagar Desai[1], Justine Renard[1], Brian Pereira[1], Christopher Norris[2], Christina Jobson[1], Nagalingam Rajakumar[1], Brian Allman[1], Steven Laviolette[1]

[1]University of Western Ontario, [2]University of Kentucky

3-F-182 ***Downstream target proteins of mTOR signaling are differentially modulated during motor skill learning***

Maxence Brouillette[1], Michel Cyr[1]

[1]UQTR - Université du Québec à Trois-Rivières

3-F-183 ***Saccadic time compression is influenced by visual stimulus novelty***

Amirhossein Ghaderi[1], George Tomou[1], John Douglas Crawford[1]

[1]York University

3-F-184 ***Molecular markers of fear learning in brain and blood: focus on doublecortin (DCX)***

Marissa Maheu[1], Sumeet Sharma[2], Kerry Ressler[1]

[1]Harvard University, [2]Emory University

3-F-185 ***Challenging physical activity enhances resilience-like behaviours and females show more resilience-like behaviors***

Stephanie Dudok[1], Sarah Curtis[1], Tammy Ivanco[1]

[1]University of Manitoba

3-F-186 ***Perineuronal net maturation around parvalbumin interneurons underlie the emergence of memory specificity***

Bi-ru Amy Yeung[1], Adam Ramsaran[1], Moriam Ahmed[1], Sheena Josselyn[1], Paul Frankland[1]

[1]University of Toronto

3-F-187 ***Occasion setting with interoceptive drug states: morphine's role as a positive and negative feature and its impact on motivational behaviour***

Allyson Andrade[1], Briana Renda[1], Karlie Lambert[1], Cassandra Sgarbossa[1], Jennifer Murray[1]

[1]University of Guelph

3-F-188 ***Assessing self-recognition in mice***

Angela Fung[1], Jesse Jackson[1]

[1]University of Alberta

3-F-189 ***Developmental stage-specific effects of alcohol can be detected in larval, 6-8 day old, zebrafish***

Amira Abozaid[1], Zelaikha Najmi*[1], Lidia Trzuskot*[1], Ishti Paul[1], Benjamin Tsang[2], Robert Gerlai[2]

[1]University of Toronto Mississauga, [2]University of Toronto

3-F-190 ***Varenicline treatment dose-dependently increases ethanol self-administration in sprague-dawley rats***

Briana Renda[1], Allyson Andrade[1], Joshua Smit[1], Lauren King[1], Jibran Khokhar[1], Scott Barrett[1], Jennifer Murray[1]

[1]University of Guelph

3-F-191 ***Differential effects of intra-PFC tetrahydrocannabinol and cannabidiol on approach-avoidance and latent inhibition in rats***

Tony Jung[1], Hanna Szkudlarek[2], Roger Hudson[2], Marta De Felice[2], Steven Laviolette[2], Walter Rushlow[2]

[1]Western University, [2]University of Western Ontario

3-F-192 ***Psychopathic traits and substance use associated with multimodal disruptions of rest-related neural activity in offenders***

Isabelle Simard[1], Matthew Shane[1]

[1]University of Ontario Institute of Technology

3-F-193 ***Dysfunction of the orbitofrontal cortex in diet-induced obesity***

Lindsay Naef[1], Lauren Seabrook[1], Corey Baimel[2], Stephanie Borgland[1]

[1]University of Calgary, [2]New York University

3-F-195 ***Prediabetes accelerates age-related neurocognitive decline***

Joyla Furlano[1]

[1]Western University

3-F-196 ***The effect of navigational strategy on theta activity while playing a platform video game***

Hugo Laflamme[1], Simon Rigoulot[2], Karim Jerbi[1], Sarah Lippé[1], Greg West[1]

[1]Université de Montréal, [2]Université du Québec à Trois-Rivières

3-F-197 ***The facilitating role of oxytocin on sexually conditioned partner preference in female rats***

Eamonn Gomez-Perales[1], Conall Mac Cionnaith[1], Marjolaine Rivest-Beauregard[1], Rebecca Cernik[1], Alice Lemay[1], Wayne Brake[1], Andrew Chapman[1], James Pfaus[2]

[1]Concordia University, [2]Universidad Veracruzana

3-F-198 ***The posterior parietal cortex modulates sound-evoked responses in the auditory cortex***

Michael Kyweriga[1], Navvab Afrashteh[1], Edgar Bermudez-Contreras[1], Jianjun Sun[1], Artur Luczak[1], Majid Mohajerani[1]

[1]Lethbridge University

3-F-199 ***Odour engrams are stored in the anterior olfactory nucleus***

Afif Aqrabawi[1], Junchul Kim[1]

[1]University of Toronto

3-F-200 ***Recruitment of thalamic spindle-generating circuitry promotes EEG patterns of general anesthesia, but does not alter general anesthetic-induced loss-of-consciousness***

Lia Mesbah-Oskui[1], Patrick Gurges[2], Wenying Liu[2], Richard Horner[2]

[1]Queen's University, [2]University of Toronto

3-F-201 ***Effects of cognitive load on cortical oscillations during a pattern learning task using MEG and pupillometry***

Silvia Isabella[1], Douglas Cheyne[1]

[1]University of Toronto and The Hospital for Sick Children (SickKids)

3-F-202 Specific firing patterns of VTA GABA neurons encode the motivational experience of acute opiate reward

Lyla El-Fayomi[1], Michael Bergamini[1], Hendrik Steenland[2], Geith Maal-Bared[1], Derek van der Kooy[1]

[1]University of Toronto, [2]NeuroTek

3-F-203 ***Lifespan changes in regional brain volume and cognitive performance associated with normal aging in mice***

Amy Miles[1], Keith Misquitta[1], Thomas Prevot[1], Jacob Ellegood[2], Jason Lerch[2], Etienne Sibille[1], Yuliya Nikolova[1], Mounira Banasr[1]

[1]CAMH, [2]Hospital for Sick Children

3-F-204 ***Intra-individual variability in reaction time: A robust marker of sex differences in prefrontal cortex (PFC) - based tasks***

Varsha Singh[1], Vaishali Mutreja[1]

[1]Indian Institute of Technology, Delhi

G - Novel methods and technology development

3-G-205 ***Can operant discrimination of acoustic stimuli increase neurogenesis in auditory perceptual brain regions in zebra finches (Taeniopygia guttata)?***

Sean Aitken[1], Sean Aitken[1], Adana Crabbe[1], Leslie Phillmore[1]

[1]Dalhousie University

3-G-206 ***DeepEEG: A Keras/TensorFlow library and notebooks for machine learning with neurophysiological data***

Kyle Mathewson[1], Kory Mathewson[1]

[1]University of Alberta

3-G-207 ***Capturing the forest but missing the trees: Microstates inadequate for characterizing shorter-scale EEG dynamics***

Saurabh Shaw[1], Kiret Dhindsa[1], James Reilly[1], Suzanna Becker[1]

[1]McMaster University

3-G-208 ***Identification of novel regulators to mediate alternative splicing of Tau exon 10***

Sansi Xing[1], Jane Wang[1], Kaiyuan Wang[1], John Crary[2], Yu Lu[1]

[1]McMaster University, [2]Ronald M. Loeb Center for Alzheimer's Disease Icahn School of Medicine at Mount Sinai

3-G-209 ***Predicting seizure onsets using cross-frequency coupling features and deep learning***

Christopher Lucasius[1], Berj Bardakjian[1]

[1]University of Toronto

3-G-210 ***Optogenetic control of cAMP and cGMP from single synapses to brain subregions***

Megan Valencia[1], Kenichi Okamoto[1]

[1]Lunenfeld-Tanenbaum Research Institute

3-G-211 ***Spike sorting of high-density multielectrode arrays: identification of excitatory and inhibitory units in large-scale neuronal circuits***

Eloïse Giraud[1], Jean-Claude Beique[1], Jean-Philippe Thivierge[1]

[1]University of Ottawa

3-G-212 ***Use of the MLSpike algorithm in the analysis of neuron network structure in the zebrafish larva***

Jean-Christophe Rondy-Turcotte[1]

[1]Université Laval

3-G-213 ***Measuring the effects of mean arterial pressure changes on spinal cord hemodynamics in a porcine model of acute spinal cord injury using a novel optical technique***

Amanda Cheung[1], Babak Shadgan[1], Neda Manouchehri[1], Kitty So[1], Allan Fong[1], Katelyn Shortt[1], Megan Webster[1], Femke Streijger[1], Andrew Macnab[1], Brian Kwon[1]

[1]University of British Columbia

3-G-214 ***Traumatic spinal cord injury and Indigenous persons: A mixed-methods pilot study to determine characteristics of a meaningful and relevant database in Ontario, Canada***

Melanie Jeffrey[1], Sandra Juutilainen[1], Suzanne Stewart[1]

[1]University of Toronto

3-G-215 ***Inference of network connectivity using maximum entropy models***

Sara Mahallati[1], Milos Popovic[2], Taufik Valiante[3]

[1]IBBME, University of Toronto, [2]University Health Network, [3]Krembil research Institute, University Health Network

3-G-216 ***Open-source software tools for relating neural activity to behaviour***

Nicholas Guilbeault[1], Jordan Guerguiev[1], Michael Martin[1], Tod Thiele[2]

[1]University of Toronto Scarborough, [2]University of Toronto

3-G-217 ***Diffusion tensor imaging of the corpus callosum in healthy aging: investigating higher order polynomial regression modeling***

Wojciech Pietrasik[1], Ivor Cribben[1], Yushuan Huang[1], Fraser Olsen[1], Nikolai Malykhin[1]

[1]University of Alberta

H - History, teaching, public awareness and societal impacts in neuroscience

3-H-218 ***Manual segmentation of hippocampal subfields from T-2 weighted MR imaging in a mouse model of stroke***

Salman Khan[1], Stefan Koch[1], Susanne Mueller[1], Felix Knab[1], Katarzyna Winek[1], Andreas Meisel[1], Rene Bernard[1], Ulrich Dirnagl[1], Christoph Harms[1], Philipp Boehm-Sturm[1]

[1]Center for Stroke Research Berlin (CSB) and Charité University Medicine Berlin

3-H-219 ***Scientific advocacy at Queen's University: Policy & neuroscience society***

Pauline Gaprielian[1], Jonathan Coutinho[1], Olivia Calancie[1]

[1]Queen's University

IBRO

3-IBRO-220 ***CONTINUOUS spike wave of slow wave sleep: A case study***

soumia djirar[1], Paul Hwang[1]

[1]University of Toronto

3-IBRO-221 ***Genetic and nongenetic factors associated with cadasil: a retrospective cohort study***

Carolina Ospina[1], Carolina Ospina[1], Daniel Aguirre[2], Yesica Zuluaga-Castaño[2], Lina Velilla[2], Yakeel Quiroz[3], Francisco Lopera[2]

[1]Harvard University, [2]University of Antioquia, [3]Massachusetts General Hospital

3-IBRO-222 ***Deorphanization of Glossina f. fuscipes odorant receptors: toward decoding tsetse fly sense of smell***

Souleymane Diallo[1], Baldywn Torto[1], Daniel Masiga[1], Alan Christoffels[1], Merid Getahun[1]

[1]International Centre of Insect Physiology and Ecology

3-IBRO-223 ***Antioxidant and apoptosis-inhibition potential of Carpobrotus edulis in a model of Parkinson's disease***

Adaze Enogieru[1], Sylvester Omoruyi[2], Okobi Ekpo[2]

[1]University of Benin, [2]University of the Western Cape

3-IBRO-224 ***Construction and use of regulatable adenovectors expressing the Yamanaka genes (OSKM) for implementing regenerative medicine in the aging brain***

Marianne Lehmann[1], Martina Canatelli-Mallat[1], Priscila Chiavellini[1], Gustavo Morel[1], Goya Rodolfo[1]

[1]Institute for Biochemical Research (INIBIOLP) Histology B & Pathology B, School of Medicine

3-IBRO-225 ***Role of succinate/suncr1 signalling pathway in paclitaxel-induced neuropathic pain***

Francisco Isaac Fernandes Gomes[1], Ricardo Kusuda[1], Rafaela Guimarães[1], Alexandre Pereira Lopes[1], Nicole da Silva[1], Fernando Cunha[1], Thiago Cunha[2]

[1]Ribeirao Preto Medical School - University of Sao Paulo, [2]University of Sao Paulo

3-IBRO-226 ***Triggering reconsolidation of an ethanol conditioned place preference (CPP) memory: the role of reactivation`s length and dopaminergic receptors***

Flávia Boos[1], Cristiane Favoretto[1], Isabel Quadros[1]

[1]Federal University of São Paulo

Poster cluster: Sustained effects of general anesthetics: missing links for GABAA

3-Cluster-227 ***Does insufficient BDNF contribute to cognitive impairment after general anesthesia?***

Ali Alavian-Ghavanini[1], Marc Anthony Manzo[1], Dian-shi Wang[1], Beverley Orser[1]

[1]University of Toronto

3-Cluster-228 ***Anesthetic activation of GABAA receptors in astrocytes persistently increases a tonic inhibitory current in neurons via an IL-1β and p38 MAPK pathway***

Arsène Pinguelo[1], Kirusanthy Kaneshwaran[1], Dian-shi Wang[1], Beverley Orser[1]

[1]University of Toronto

3-Cluster-229 ***Comparing negative allosteric modulators of alpha5GABAA receptors for inhibition of a tonic current in primary hippocampal neurons***

Marc Anthony Manzo[1], Winston Li[1], Dian-shi Wang[1], Beverley Orser[1]

[1]University of Toronto

3-Cluster-230 ***Ketamine prevents an anesthetic-triggered persistent hyperactivity of GABAA receptors via NMDA receptor-independent mechanisms***

Winston Li[1], Agnes Crnic[1], Dian-shi Wang[1], Beverley Orser[1]

[1]University of Toronto

3-Cluster-231 ***The 'double hit' of inflammation and general anesthesia causes persistent cognitive impairment in mice***

Shahin Khodaei[1], Raza Syed[1], Dian-shi Wang[1], Beverley Orser[1]

[1]University of Toronto

Poster cluster: Using MRI to index memory differences across the lifespan

3-Cluster-232 ***Estimating Alzheimer's risk from memory performance***

Sheida Rabipour[1], Elsa Yu[1], Sricharana Rajagopal[1], Stamatoula Pasvanis[1], John Breitner[1], M. Natasha Rajah[1]

[1]McGill University

3-Cluster-233 ***Age- and reserve-related increases in fronto-parietal and anterior hippocampal activity during episodic encoding predict subsequent memory***

Abdel Elshiekh[1], Sricharana Rajagopal[1], Stamatoula Pasvanis[1], Elizabeth Ankudowich[1], Maria Rajah[1]
[1]McGill University

3-Cluster-234 ***Using brain cortical thickness to predict chronological age: evidence from an adult lifespan sample***

Sivaniya Subramaniapillai[1], A. Ross Otto[1], Sricharana Rajagopal[1], Stamatoula Pasvanis[1], M. Natasha Rajah[1]
[1]McGill University

3-Cluster-235 ***Anterior and posterior memory systems differentially predict associative and recognition memory in young adults***

Jamie Snytte[1], Abdel Elshiekh[1], Sivaniya Subramaniapillai[1], Lyssa Manning[1], Rosanna Olsen[2], Natasha Rajah[1]
[1]McGill University, [2]University of Toronto

Poster cluster: Vulnerable brain laboratory

3-Cluster-236 ***A novel perspective on white matter inflammation following a permanent middle cerebral artery occlusion in Wistar rats***

Berk Rasheed[1], Rishika Geda[1], Romit Bhusari[1], Elena Hachinski[1], Omar Eldash[1], Shawn Whitehead[2]
[1]University of Western Ontario, [2]Western University

3-Cluster-237 ***Arteriole and venule collagenosis and density alterations within post mortem white matter hyperintensities and periventricular infarction in aging, cerebrovascular and Alzheimer's disease***

Austyn Roseborough[1], Kristopher Langdon[1], Robert Hammond[1], Stephen Pasternak[2], Ali Khan[3], Shawn Whitehead[1]
[1]Western University, [2]Robarts Research Institute, [3]University of Western Ontario

3-Cluster-238 ***Autonomic mechanisms underlying post-stroke cardiac dysfunction in the insular ischemic stroke rat model***

Victoria Jaremek[1], Brittany Balint[1], Victoria Thorburn[1], Thomas Milazzo[1], Lynn Wang[1], Shawn Whitehead[1], Luciano Sposato[2]
[1]Western University, [2]Schulich School of Medicine and Dentistry

3-Cluster-239 ***Transgenic rat model of Alzheimer's disease develop deficits in cognition and widespread neuroinflammation with age***

Qingfan Liu[1], Nina Weishaupt[1], Sheojung Shin[1], Ramandeep Singh[1], Yuksel Agca[2], Cansu Agca[2], Vladimir Hachinski[1], Shawn Whitehead[3]
[1]Vulnerable Brain Laboratory, Schulich School of Medicine and Dentistry, Western University, [2]University of Missouri, [3]Western University

3-Cluster-240 ***Enhancement of ganglioside signal in MALDI MS imaging of formalin fixed human brain tissue***

Aaron Harris[1], Austyn Roseborough[1], Rahul Mor[1], Shawn Whitehead[1]
[1]Western University

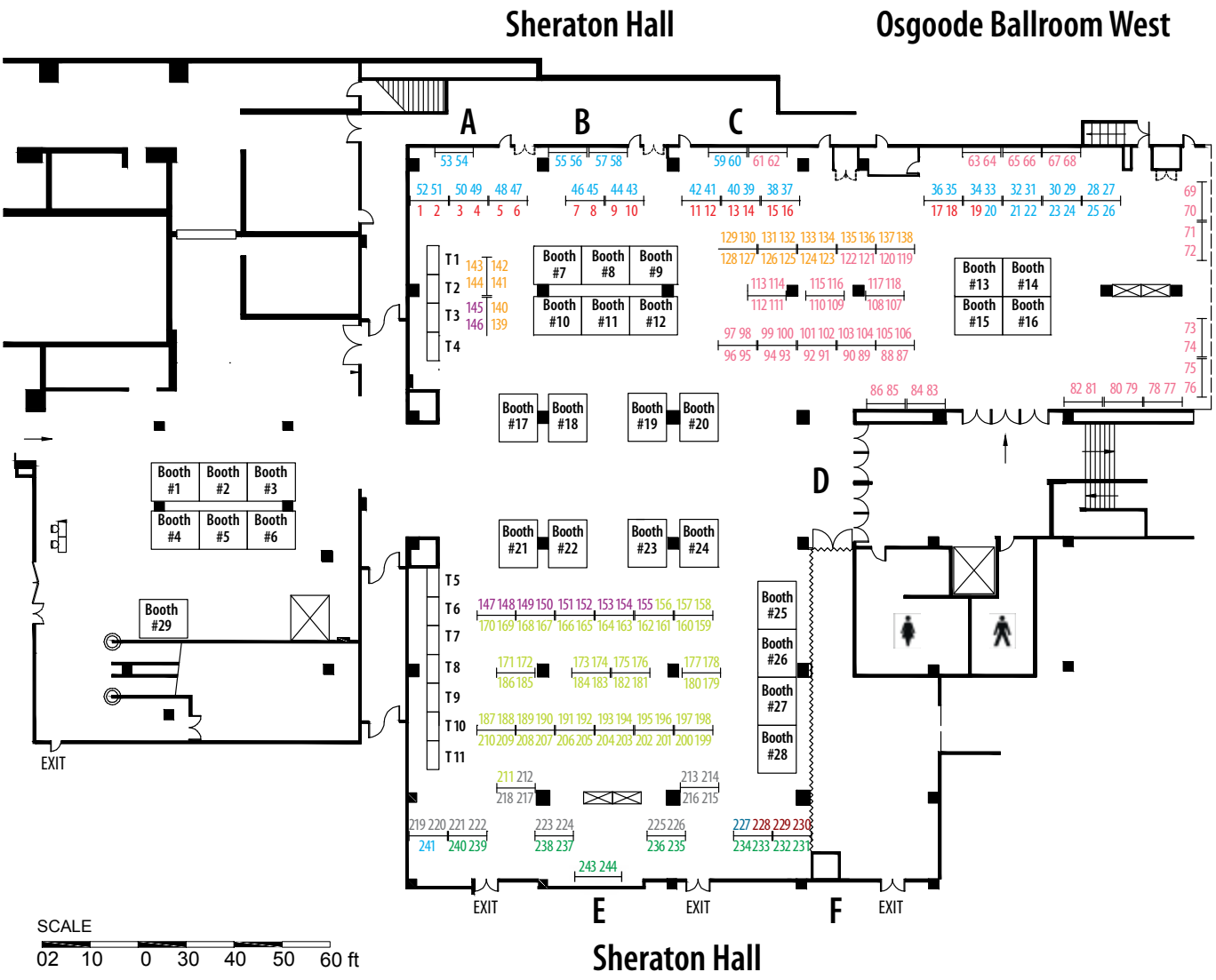
POSTER & EXHIBITOR FLOOR PLANS

Location	Exhibitor
Booth 01	StressMarq Biosciences Inc.
Booth 02	Blactek Inc.
Booth 03	Tucker - Davis Technologies
Booth 04	ANT Neuro North America
Booth 05	Laserglow Technologies
Booth 06	MED Associates Inc.
Booth 07	eNUVIO inc.
Booth 08	BioLegend
Booth 09	Ripple Neuroscience
Booth 10	Plexon
Booth 11	ALZET® Osmotic Pumps/DURECT Corporation
Booth 12	STEMCELL Technologies
Booth 13	Neurescence Inc.
Booth 14	Olympus
Booth 15	Viewpoint Life Sciences
Booth 16	SensoMedical, Inc.
Booth 17	Gene Tools, LLC
Booth 18	PeproTech, Inc
Booth 19	Lafayette Instrument Company
Booth 20	Stoelting Co.
Booth 21	Noldus Information Technology
Booth 22	FUS Instruments Inc.
Booth 23	Mightex
Booth 24	RWD Life Science
Booth 25	Inscopix, Inc.
Booth 26	Advanced Targeting Systems
Booth 27	g.tec neurotechnolgy USA, Inc.
Booth 28	McGill University
Booth 29	NIKON Canada Inc

Location	Exhibitor
T 01	Toronto Dementia Research Alliance
T 02	Cell Signaling Technology
T 03	Parkinson Canada
T 04	Toronto Research Chemicals
T 05	Hello Bio
T 06	MKS Spectra-Physics
T 07	Doric Lenses
T 08	Centre for Neuroscience Studies
T 09	Advanced Cell Diagnostics
T 10	The Canadian Neurophotonics Platform
T 11	INCF

Poster session 1

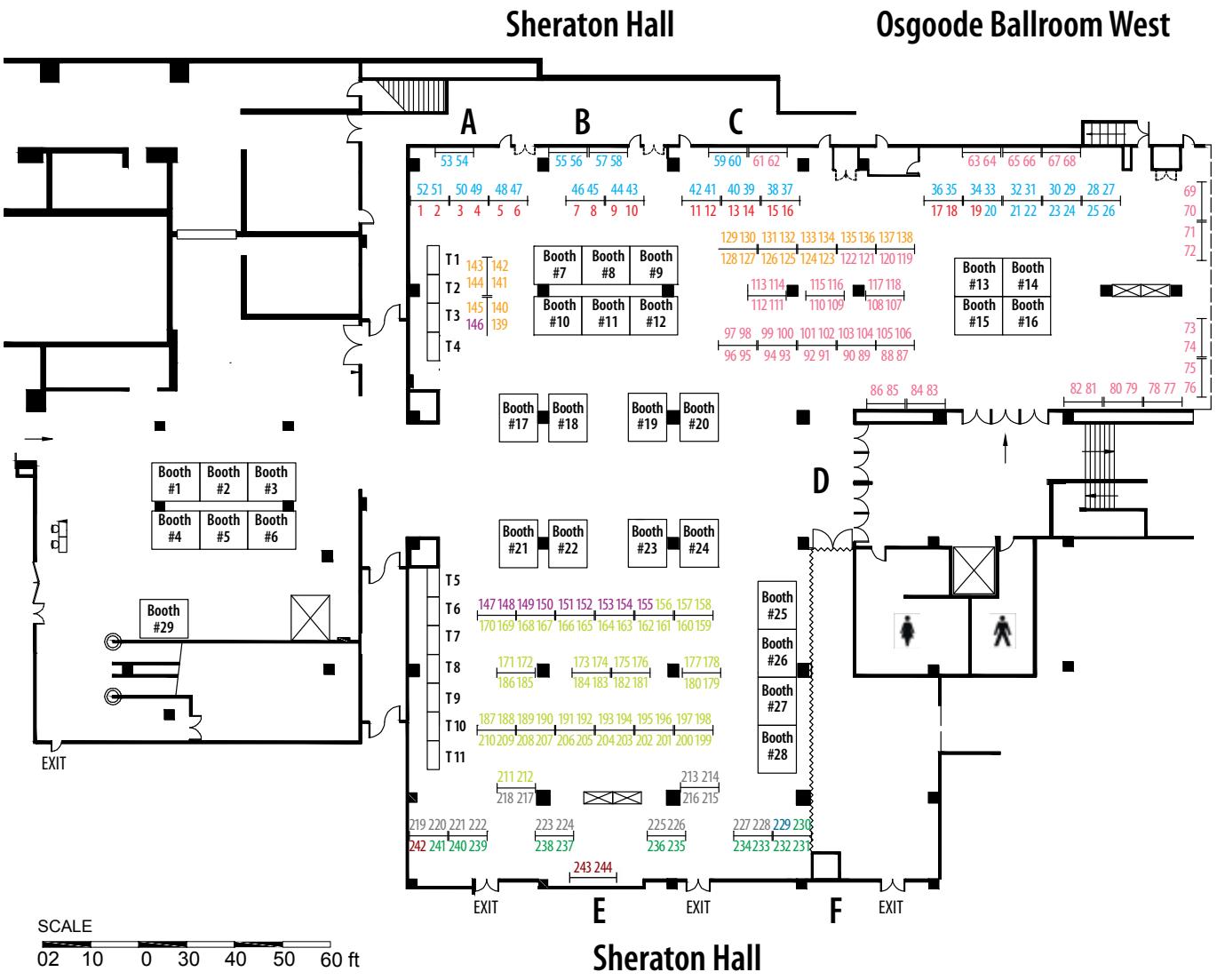
Thursday, May 23, 2019



- A Development
- B Neural Excitability, Synapses & Glia: Cellular Mechanisms
- C Disorders of the Nervous System
- D Sensory & Motor Systems
- E Homeostatic & Neuroendocrine Systems
- F Cognition & Behaviour
- G Novel Methods & Technology Development
- H History, Teaching, Public Awareness and Societal Impacts in Neuroscience
- IBRO International Brain Research Organisation
- Cluster Cluster Posters

Poster session 2

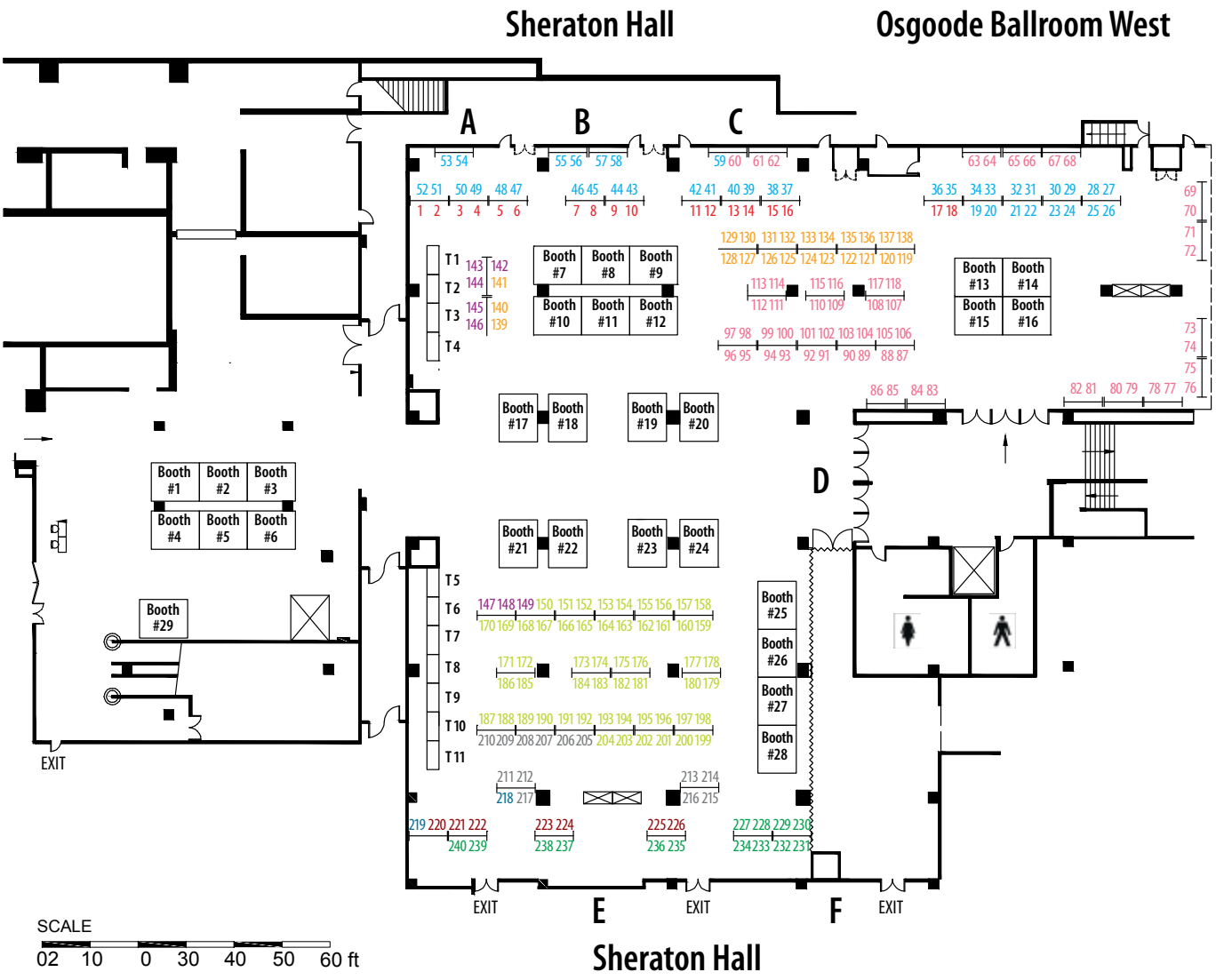
Friday, May 24, 2019



- A Development
- B Neural Excitability, Synapses & Glia: Cellular Mechanisms
- C Disorders of the Nervous System
- D Sensory & Motor Systems
- E Homeostatic & Neuroendocrine Systems
- F Cognition & Behaviour
- G Novel Methods & Technology Development
- H History, Teaching, Public Awareness and Societal Impacts in Neuroscience
- IBRO International Brain Research Organisation
- Cluster Cluster Posters

Poster session 3

Saturday, May 25, 2019



- **A** Development
- **B** Neural Excitability, Synapses & Glia: Cellular Mechanisms
- **C** Disorders of the Nervous System
- **D** Sensory & Motor Systems
- **E** Homeostatic & Neuroendocrine Systems
- **F** Cognition & Behaviour
- **G** Novel Methods & Technology Development
- **H** History, Teaching, Public Awareness and Societal Impacts in Neuroscience
- **IBRO** International Brain Research Organisation
- **Cluster** Cluster Posters

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