

The Canadian Association
for Neuroscience presents

9th Annual Canadian Neuroscience Meeting 2015

MEETING PROGRAM



www.can-acn.org

May 24–27, 2015
Westin Bayshore Hotel
Vancouver, BC

PROGRAM AT A GLANCE

TIME	Saturday 23-May	Sunday 24-May			Monday 25-May	Tuesday 26-May	Wednesday 27-May						
8:00	Free Time	Registration and Conference Information Desk Open	CAPnet / CPS Joint Satellite: Vision and Movement Order and Disorder: From Bench to Bedside Canadian Neurophotonics Platform: Using Light to Monitor and Change the Brain Alternative Careers Workshop for Trainees			Registration and Conference Information Desk Open		Registration and Conference Information Desk Open					
8:15													
8:30							Plenary Synposium 1 8:30-9:30AM			Plenary Synposium 2 8:30-9:30AM	Plenary Synposium 3 8:30-9:30AM		
8:45													
9:00													
9:15													
9:30													
9:45										Coffee Break Posters & Exhibits 9:30-10:45AM	Coffee Break Posters & Exhibits 9:30-10:45AM	Coffee Break Exhibits 9:30-10:45AM	
10:00													
10:15													
10:30													
10:45										Brainstar Award 10:45-11:00AM	Brainstar Award 10:45-11:00AM	Brainstar Award 10:45-11:00AM	
11:00													
11:15										Plenary Speaker 1 Mayank Mehta 11:00-12:00PM	Plenary Speaker 2 Karel Svoboda 11:00-12:00PM	Plenary Speaker 3 Kristin Scott 11:00-12:00PM	
11:30													
11:45													
12:00													
12:15											CAN-ACN AGM 12:00-12:30		
12:30										Lunch on own 12:00-1:30PM		Lunch on own 12:00-1:30PM	
12:45											Lunch on own 12:30 - 1:30		
1:00													
1:15													
1:30													
1:45													
2:00				Parallel Symposia 1-4 1:30-3:00PM	Parallel Symposia 5-8 1:30-3:00PM	Parallel Symposia 9-12 1:30-3:00PM							
2:15													
2:30													
2:45													
3:00				Coffee Break 3:00-3:30PM	Coffee Break 3:00-3:30PM	Free Time							
3:15													
3:30													
3:45													
4:00													
4:15													
4:30	CAN 2015 Public Lecture Jon Stoessl & Janet Werker Science World 4:00-6:00PM			Posters & Exhibits 3:30-5:30PM	Posters & Exhibits 3:30-5:30PM								
4:45													
4:50				Opening Remarks - Doug Munoz									
5:00				Young Investigator Award - Samuel David									
5:15				Conversation about Brain Health with CAN, CIHR, NHCC, Brain Canada	Young Investigator Lecture 5:30-6:00PM								
5:30													
5:45													
6:00	Free Time			Presidential Lecture Melvyn Goodale 6:00-7:00PM	Parallel Sessions 5:30-7:00PM	Keynote Lecture Clay Reid 6:00-7:00PM							
6:15													
6:30													
6:45													
7:00				Opening Reception (hosted) Currents Restaurant / Pool & Garden Area 7:00-8:15PM		Reception (non-hosted) Room TBC 7:00-8:00	Reception (non-hosted) Room TBC 7:00-8:00						
7:15													
7:30													
7:45													
7:50							CAN Student Social Mahoney & Sons 7:30-9:30PM	Free Time					
8:00													
8:15													
8:30													
9:00													

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CONFERENCE SPECIALISTS

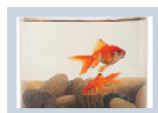
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ABOUT CAN-ACN



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 the country and abroad. This highly regarded conference is in its 9th year.

9th Annual The Canadian Association for Neuroscience presents Canadian Neuroscience Meeting 2015

LETTER FROM THE PRESIDENT

DEAR COLLEAGUES AND FRIENDS,

It is my pleasure to welcome you to the 9th Annual Canadian Neuroscience Meeting in Vancouver. Our Scientific Program committee has put together an impressive list of Keynote and Plenary speakers. As we build on the experience of our previous meeting, we aim to continue to showcase the best of neuroscience research in Canada.

I wish to thank all our members who submitted abstracts and session proposals for the annual meeting. It is the quality of these submissions that drives the content and excellence of our meeting. I especially want to thank all our members who have submitted proposals for parallel symposia this year. As you will see in the program, parallel symposia, organized by our members, are a very important part of our meeting, and feature a wide range of research topics.

I also wish to thank our members who submitted the names of candidates for the Young Investigator Award. The very high quality of the candidates proposed this year highlight the excellence of many young neuroscientists in this country. All candidates can be proud of having been nominated.

The CAN meeting is an ideal place to meet and interact with colleagues from across the country. It is also a great place for trainees to present their work, get valuable feedback, and make connections for the future. We also have special mentoring and career development sessions planned for trainees and junior investigators.

I hope you enjoy the meeting, and I look forward to seeing you in person in Vancouver.

Best Regards,

Doug Munoz,
President of the Canadian Association for Neuroscience

CHERS COLLÈGUES ET AMIS,

Il me fait grand plaisir de vous accueillir à Vancouver pour le 9^{ème} congrès annuel de l'Association canadienne des neurosciences. Notre comité du programme scientifique a assemblé un groupe impressionnant de présentateurs pléniers et de d'honneur. En bâtissant sur l'expérience acquise au cours des congrès antérieurs, nous visons à toujours vous présenter le meilleur de la recherche en neuroscience au Canada.

Je tiens à remercier tous les membres qui ont soumis des résumés pour les présentations orales et par affiche de notre congrès. La qualité de ces soumissions assure à chaque année un contenu renouvelé et l'excellence du congrès. Comme vous le constaterez dans le programme, les symposiums parallèles, organisés par nos membres, sont une composante centrale du congrès, et permettent de mettre en valeur une grande variété de sujets de recherche.

Je veux aussi remercier les membres qui ont soumis le nom d'un candidat pour le prix du Jeune chercheur de l'ACN 2015. La grande qualité des candidatures soumises cette année met en lumière l'excellence de la relève en recherche en neuroscience dans notre pays. Tous les candidats peuvent être fiers de leur mise en candidature.

Le congrès de l'ACN est l'endroit idéal pour rencontrer et interagir avec des collègues de tous les coins du pays. C'est aussi une occasion pour les étudiants et stagiaires de présenter leur travail et de recevoir un feedback important. Nous offrons également des séances de mentorat et de développement de carrière pour les étudiants, stagiaires et jeunes chercheurs.

Nous vous souhaitons un excellent congrès, et avons bien hâte de vous accueillir en personne!

Bien à vous,

Doug Munoz
Président de l'Association canadienne des neurosciences

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: **DOUG MUNOZ**, Queen's University
Vice-president
(President-elect): **FREDA MILLER**, University of Toronto
Secretary: **KATALIN TOTH**, Université Laval
Treasurer: **ELLIS COOPER**, McGill University

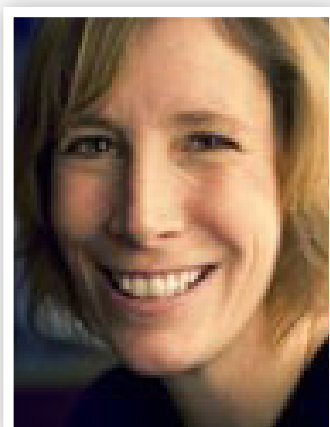
Board Members:

Past President: **SAMUEL DAVID**, McGill University
Advocacy Officer: **DAVID KAPLAN**, University of Toronto
CHARLES BOURQUE, McGill University
WILLIAM COLMERS, University of Alberta
EDWARD RUTHAZER, McGill University
MELANIE WOODIN, University of Toronto

2015 Scientific Program Committee



Conference Chair:
DR. KURT HAAS
Associate Professor, Department
of Anatomy and Cell Biology,
University of British Columbia
Tula Foundation Investigator,
Brain Research Centre
MSFHR Scholar



Co-chair:
DR. KATHLEEN E. CULLEN
Professor, Department of
Physiology, McGill University

NAME	INSTITUTION	NAME	INSTITUTION
JAIDEEP BAINS	University of Calgary	STEVE LACROIX	Université Laval
SHERNAZ BAMJI	University of British Columbia	NEIL MAGOSKI	Queen's University
JEAN-FRANÇOIS CLOUTIER	McGill University	KARIM NADER	McGill University
JODY CULHAM	University of Western Ontario	AMY RAMSEY	University of Toronto
KERRY DELANEY	University of Victoria	CATHERINE RANKIN	University of British Columbia
MICHIRU HIRASAWA	Memorial University	KAORI TAKEHARA-NISHIUCHI	University of Toronto
JOHN HOWLAND	University of Saskatchewan	LOUIS-ERIC TRUDEAU	Université de Montréal
STEFAN KOHLER	University of Western Ontario		

CAN-ACN ADMINISTRATION

ASSOCIATION SECRETARIAT & CONFERENCE MANAGEMENT

secretariat@can-acn.org

PODIUM CONFERENCE SPECIALISTS

- Marischal De Armond
- Darcy Lipsey
- Caitlin Mooney

COMMUNICATIONS DIRECTOR AND WEBMASTER

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.

10th Annual CAN-ACN Meeting

Toronto, Ontario · May 29 – June 1, 2016



Sheraton Centre Toronto Hotel

Abstract submission opens November 2015 · Registration opens early 2016

Special CAN-ACN rates:
Double Room (single or double occupancy) \$189

GENERAL CONFERENCE INFORMATION

Conference Venue

WESTIN BAYSHORE

1601 Bayshore Drive, Vancouver, BC V6G 2V4

All conference sessions will take place in this location.

Registration

Annual Conference 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 conference sessions, coffee breaks, reception. Please wear it at all times. At the end of the Conference 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.

Registration and Information Desk Hours

The CAN-ACN Registration and Information Desk, located in the Bayshore Grand Ballroom Foyer will be open during the following dates and times:

SUNDAY, MAY 24	8:00 AM to 8:00 PM
MONDAY, MAY 25	8:00 AM to 7:00 PM
TUESDAY MAY 26	8:00 AM to 7:00 PM
WEDNESDAY MAY 27	8:00 AM to 4:00 PM

If you need assistance during the conference, please visit the Registration Desk.

Poster Information

SET-UP / REMOVAL

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

POSTER SESSION 1 — Monday, May 25

Poster Hours: 9:30 — 10:45 AM
(Lunch on own — posters will remain open) 12:00 PM — 1:30 PM
3:30 — 5:30 PM

Poster set-up: Monday, May 25: 7:30 — 8:30 AM

REMOVAL OF ALL POSTERS BY: 8:00PM ON MAY 25

POSTER SESSION 2 — Tuesday, May 26

Poster Hours: 9:30 — 10:45 AM
(Lunch on own — posters will remain open) 12:00 PM — 1:30 PM
3:30 — 5:30 PM

Poster set-up: Tuesday, May 26: 7:30 — 8:30 AM

REMOVAL OF ALL POSTERS BY: 8:00 PM ON MAY 26

Information on Poster Authors, Poster Numbers and Poster Titles begins on page 27. Digital copies can be downloaded from the Member Only section of the [CAN-ACN Website](#).

Message Board

For your convenience, a Message Board will be located near the Registration Desk. Feel free to leave messages of interest to other conference participants.

Staff

CAN-ACN staff from Podium Conference Management can be identified by 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.

Nearby Amenities

Currents Restaurant, the Seawall Bar & Grill, Starbucks and the pools/workout room are all located on the Level 1 of the hotel.

The Westin Bayshore is a downtown Vancouver hotel that offers guests the best of both worlds: the activities and cultural events of the city, as well as a relaxing Vancouver resort experience.



Operant, Behavior, & Cognition
Activity, Exercise, & Motility
Tissue Sectioning & Slice Chambers

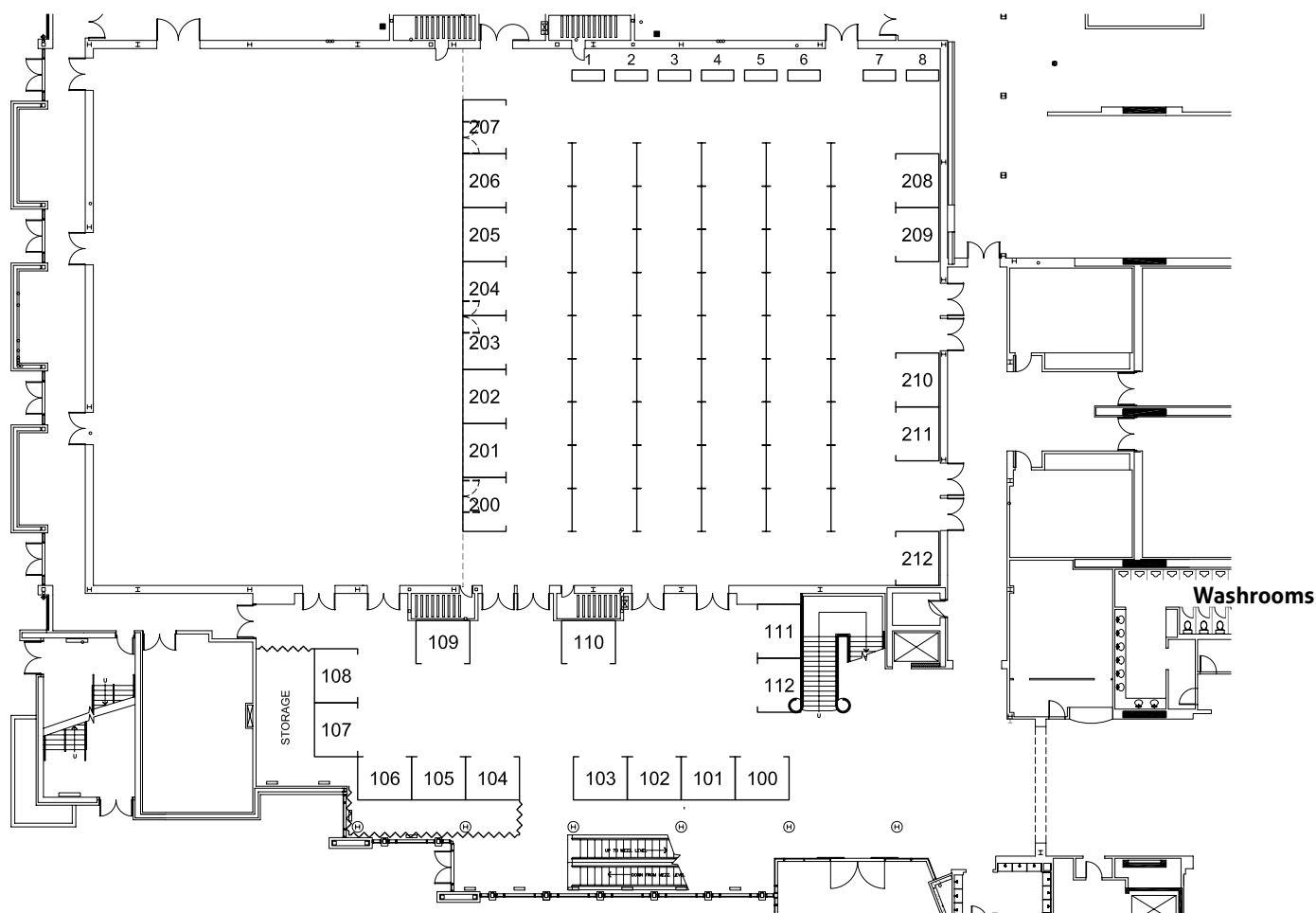
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EXHIBITORS

Bayshore Ballroom DEF



BOOTH #	EXHIBITOR
100	Fine Science Tools
102	NeuroNexus
103	Stoelting Co.
104	Scientifica Ltd
105	Society for Neuroscience
106	Canadian Institutes of Health Research (CIHR)
108	STEMCELL Technologies, Inc.
109	Plexon
110	Olympus Canada Inc
111	Ted Pella, Inc.
112	Leica Microsystems Canada Inc.
200	Noldus Information Technology
201	Lafayette-Campden Neuroscience
202	TMS International

BOOTH #	EXHIBITOR
203	Blackrock Microsystems
204	Huron Digital Pathology
207	Clever Sys Inc.
208	Tucker-Davis Technologies
209	HEKA Electronics Inc.
210	Integrated DNA Technologies
211	Precision NanoSystems Inc.
212	Abcam
TABLE TOP 1	StressMarq Biosciences Inc.
TABLE TOP 2	ALZET Osmotic Pumps/DURECT Corp
TABLE TOP 5	Animal Care Systems
TABLE TOP 6	Parkinson Society Canada - Société Parkinson Canada

2015 CAN YOUNG INVESTIGATOR AWARDEE

The Canadian Association for Neuroscience (CAN) is proud to announce that **DR. MICHAEL GORDON**, from the University of British Columbia, has been awarded the 2015 CAN Young Investigator Award for the 9th Annual Canadian Neuroscience Meeting in Vancouver, British Columbia.

**The Young Investigator Award Lecture
will take place on Tuesday, May 26 from 5:30pm – 6:00pm
in the Bayshore Ballroom**



MICHAEL GORDON

University of British Columbia

Dr. Michael Gordon's research provides insight into two of the most critical decisions we, and other animals, have to make: what to eat, and how much. He studies this important and complex question in the fruit fly, *Drosophila melanogaster*, which has a relatively simple nervous system, with one million times fewer neurons

than ours, yet displays a complex array of behaviours in response to food cues. He has significantly contributed to our understanding of the neural circuits that drive taste responses and feeding preferences.

Using the fly brain as a model, the Gordon lab combines molecular genetics with optical techniques and electrophysiology to map taste circuits, probe how these circuits encode information, and unravel their impact on feeding. These studies contribute to our understanding of how the brain translates sensory information into behaviour.

Dr. Gordon's work has shown that food preference can be viewed as a changing metric, based initially on taste, but evolving with experience, and the animal's physiological condition. These studies support the concept that in addition to sensing the palatability of food, like the sweetness or bitterness, flies also have a mechanism for sensing its caloric content, and that this could drive longer-term food preferences.

More recently, Dr. Gordon's team has uncovered a neural mechanism used by the fly brain to integrate the opposing effects of sweet and bitter tastes. Information from multiple sensory cues, the physiological state and experience of the animals thus all contribute to guiding feeding decisions.

Dr. Gordon's publication track record demonstrates the importance of his research contributions, and it is particularly impressive to note his productivity in the short four years since he has established himself as an independent researcher at the University of British Columbia. His recent research has been published in prestigious journals such as *Nature Communications* (2015), *Current Biology* (2014), *Neuron* (2014, 2013), and *The Journal of Neuroscience* (2012). Dr. Gordon's contributions, which include earlier publications in *Neuron* in 2009 and *Nature* in 2005, have had significant impact and are highly cited, further demonstrating his position as a leader in the field of feeding regulation.

In addition, Dr. Gordon is a much-appreciated Faculty member at the department of Zoology at the University of British Columbia. His extensive teaching duties and successful mentorship of both undergraduate and graduate students attests to his importance in the Department.

The Canadian Association for Neuroscience wishes to thank Dr. Vanessa Auld, Professor at the University of British Columbia, and Dr. Tim O'Connor, Professor and Chair of the Graduate Program in Neurosciences at University of British Columbia, for nominating him for this award.

Within a very short time period as an independent researcher, Dr. Michael Gordon has established himself as an exceptional young scientist and a rising star in Canadian Neuroscience. We are very proud to present him with the 2015 CAN Young Investigator Award.

ABSTRACT:

Integrating taste modalities and motivation in the *Drosophila* brain.

Food palatability is heavily dependent on taste and internal motivation. Sweet compounds act as appetitive cues that suggest the presence of nutritive carbohydrates, while bitter compounds are aversive and can serve as a warning of toxins. Palatability is determined in part by the relative contribution of these, and other, taste modalities, but the neural mechanisms underlying their integration are largely unknown. Recently, we discovered that presynaptic gain control underlies sweet and bitter taste integration in the fly brain. Sweet gustatory neurons express the metabotropic GABABR, which inhibits their synaptic activity. Since both sweet and bitter stimuli lead to GABA release in the taste centre of the brain, presynaptic inhibition of sweet neurons via GABABR expands their dynamic range and suppresses their output in the presence of opposing bitter stimuli. This provides an efficient global mechanism of suppressing appetitive taste behaviours towards sweet foods laced with bitter compounds. However, the aversive effects of bitter taste are also modulated by motivation – hungry flies are more likely to consume bitter foods than flies that are sated. We have uncovered a population of neurons in the fly brain that link satiety state with bitter taste. The activity of these modulatory neurons decreases upon starvation, and artificially silencing them renders flies relatively insensitive to bitter compounds by reducing bitter neuron synaptic output. Overall, we favour a model in which synaptic modulation of gustatory neurons underlies integration of taste modalities and plasticity of taste circuits in response to changes in nutritional needs.

BRAIN STAR AWARDEE TALKS 2015

Each year, since 2001, the Institutes for Neuroscience, Mental Health and Addiction (INMHA) of the Canadian Institutes of Health Research (CIHR) selects up to 15 great research articles and award their authors a Brain Star Award. These awards were designed to recognize the excellence of research done in Canada by students and trainees in all fields and disciplines covered by INMHA, to promote research careers in neuroscience, mental health and addiction in Canada, and to stimulate the participation of trainees in the planning and development of INMHA activities.

The top three Brain Star Awardees are invited by INMHA and CAN to present their award-winning research at the Canadian Neuroscience Meeting. INMHA also gives the recipient a prize of \$1,500, and recognition on the INMHA website and communications.

MARTIN MUNZ McGill University

MONDAY, MAY 25, 10:45-11:00AM

Neuronal firing of retinal ganglion cell axons instructs growth and connectivity in the developing visual system

Hebbian plasticity is a process in which temporal correlation between the pre- and postsynaptic cell's firing instructs circuit refinement during development. Retinal ganglion cell (RGC) axons of *Xenopus* tadpoles, mainly innervate the contralateral optic tectum, however we found that in about 40% of tadpoles a few axons are misguided to the ipsilateral tectum. We used visual stimulation designed to synchronously or asynchronously activate single ipsilateral RGC axons relative to the contralateral inputs to see how correlated firing instructs circuit formation and plasticity. Two-photon time lapse imaging of ipsilateral RGC axons revealed that asynchronous, but not synchronous stimulation, upregulated branch additions. However, synchronous stimulation stabilized axonal branches and suppressed branch additions. To see how synaptic transmission contributes to axonal branch formation and stability, we transfected the ipsilateral RGCs to express tetanus toxin light chain (TeNT-LC) to prevent synaptic transmission. Visual stimulation still promotes axonal branching in these cells but, the stabilization of newly formed branches by synchronous stimulation was lost. To see if the neural activity in RGCs promotes axonal branch motility independently of other inputs we stimulated ipsilateral RGC axons, expressing TeNT, by stimulation of the ipsilateral eye. We found that stimulation of the contralateral eye is sufficient to upregulate axonal branch motility in the ipsilateral axon, while stimulation of the ipsilateral axon itself induces increased retraction of that axon. Thus, the activity of surrounding contralateral axons promotes increased axonal branch motility, while cell-autonomous firing causes branch tip retraction.

YING CHEN York University

TUESDAY, MAY 26, 10:45 – 11:00AM

Allocentric and Egocentric Representations for Visual Memory and Action in Human Cortex

How do we aim movements toward objects? For instance, how are we able to accurately reach for a cup of coffee located on a table next to a computer monitor we are looking at? Many daily activities involve such a reaching movement. In these situations, the visual location of the target object can be represented in two different frames of reference, either relative to one's own body (egocentric), or relative to a visual landmark (allocentric). In real world situations, the brain uses both of these representations to guide action, but little is known about the specific neural mechanisms for either allocentric representation, or its conversion into egocentric movement commands. My research focused on answering these questions using event-related fMRI designs.

The goal of my first study (Chen et al. *Journal of Neuroscience* 2014) was to distinguish brain areas involved in the two types of representation in memory for reach. This study found that partially overlapping but different brain areas were responsible for allocentric and egocentric representations of remembered visual targets. In particular, superior occipital gyrus was involved in egocentric visual direction, in contrast, inferior temporal gyrus and inferior occipital gyrus encoded allocentric visual direction. For both tasks, a complete parieto-frontal network coded movement direction during final reach response. Based on the finding of this fMRI study and my previous behavioral study showing an early conversion of allocentric-to-egocentric representation (Chen et al. *Neuropsychologia* 2011), my following fMRI study was designed to especially examine brain areas involved in allocentric-to-egocentric conversion of remembered visual target for reach. This study indicates that specific areas of posterior parietal and frontal cortices, including precuneus, middle frontal gyrus and inferior parietal cortex were implicated in converting allocentric representations of remembered target direction into egocentric plans for reach. The findings of the two fMRI studies together provide researchers and clinicians with important applications for patients with brain damage in "allocentric" versus "egocentric" areas of the brain, for which different therapeutic approaches can be developed.

ROBERT P. BONIN Institut Universitaire en Santé Mentale de Québec

WEDNESDAY, MAY 27, 10:45 – 11:00AM

A spinal analogue of memory reconsolidation enables the reversal of hyperalgesia

The development of persistent pain through the sensitization of pain relays in the spinal cord dorsal horn shares many mechanistic and phenotypic parallels with memory formation. The parallels between memory formation and hyperalgesia raise the possibility that hyperalgesia may also exhibit a phenomenon similar to memory reconsolidation: a process in which memories are rendered labile after reactivation and susceptible to disruption. We tested the hypothesis that the reactivation of sensitized pain pathways initiates a process similar to memory recall and reconsolidation to render hyperalgesia labile and reversible.

BRAIN STAR AWARDEE TALKS 2015

We find that both acute and long-lasting mechanical hyperalgesia could be reversed after reactivation of the sensitized pain pathway and the inhibition of spinal protein synthesis. In electrophysiological experiments, synaptic facilitation in the superficial dorsal horn, a cellular model of hyperalgesia, was similarly rendered labile and reversible by reapplying the LTP induction stimulus in the presence of the protein synthesis inhibitor anisomycin. These findings provide the first demonstration of a reconsolidation-like phenomenon in spinal pain processing pathways and the sensory system in general, suggesting that reconsolidation may exist more broadly throughout the CNS than previously known. These findings may further provide a novel therapeutic strategy for the treatment and erasure of persistent pain.

Acknowledgements: This work was funded by the Canadian Institutes of Health Research (CIHR), the Fonds de recherche du Québec - Santé (FRQS), and the Louise and Alan Edwards Foundation.

SPECIAL MEETINGS & SOCIAL EVENTS

SATURDAY, MAY 23

4:00 – 6:00 PM	CAN 2015 PUBLIC LECTURE
Science World, 1455 Quebec St, Vancouver, BC	<i>The Clinic as Laboratory: Lessons from Parkinson's</i> JON STOESSL , Co-Director of the Djavad Mowafaghian Centre for Brain Health, University of British Columbia <i>Understanding the foundations of language development by studying the infant brain</i> JANET WERKER , Professor and Canada Research Chair, Department of Psychology, University of British Columbia

SUNDAY, MAY 24

6:00 – 7:00 PM	PRESIDENTIAL LECTURE
Bayshore Ballroom Salon ABC	Sponsored by THE ONTARIO BRAIN INSTITUTE MELVYN GOODALE , University of Western Ontario <i>How We See and Hear Stuff: Visual and Auditory Routes to Understanding the Material Properties of Objects</i>
7:00 – 8:15 PM	OPENING RECEPTION (HOSTED)
Currents Restaurant / Pool & Garden Area	

MONDAY, MAY 25

7:00 – 8:00 PM	RECEPTION (NON-HOSTED)
Bayshore Ballroom Salon DEF	
7:30 – 9:30 PM	CAN STUDENT SOCIAL
Mahoney & Sons Burrard Landing (1055 Canada Place, Unit #36)	Sponsored by Island Medical Program & Division of Medical Sciences, University of Victoria, University of British Columbia, and The Graduate Program in Neuroscience Canadian Society for Molecular Biosciences (CSMB)

TUESDAY, MAY 26

12:00 – 12:30 PM	CAN-ACN ANNUAL GENERAL MEETING
Bayshore Ballroom Salon ABC	All CAN members invited to attend
6:00 – 7:00 PM	KEYNOTE LECTURE
Bayshore Ballroom Salon ABC	Sponsored by Djavad Mowafaghian Centre for Brain Health CLAY REID , Allen Institute for Brain Science <i>Functional Connectomics at the Allen Institute</i>
7:00 – 8:00 PM	RECEPTION (NON-HOSTED)
Bayshore Ballroom Salon DEF	

ANNUAL CONFERENCE SCHEDULE

SATURDAY, MAY 23, 2015

4:00 – 6:00 PM
Science World,
1455 Quebec St, Vancouver, BC

CAN 2015 PUBLIC LECTURE

JON STOESSL, Co-Director of the Djavad Mowafaghian Centre for Brain Health University of British Columbia
The Clinic as Laboratory: Lessons from Parkinson's

JANET WERKER, Professor and Canada Research Chair, Department of Psychology, University of British Columbia
Understanding the foundations of language development by studying the infant brain

SUNDAY, MAY 24, 2015

9:00 AM – 4:45 PM
Stanley Park Salon 1

SATELLITE 1

CAPnet / CPS: Vision and Movement Order and Disorder: From Bench to Bedside

9:00 AM – 4:45 PM
Stanley Park Salon 2

SATELLITE 2

Canadian Neurophotonics Platform: Using Light to Monitor and Change the Brain

9:00 AM – 4:00 PM
Stanley Park Salon 3

SATELLITE 3

Alternative Careers Workshop for Trainees

WELCOME AND OPENING REMARKS

5:00 – 6:00 PM
Bayshore Ballroom Salon ABC

DOUG MUNOZ, President of the Canadian Association for Neuroscience

YOUNG INVESTIGATOR AWARD PRESENTATION

SAMUEL DAVID, Chair of the Nominations Committee
Developing a Dialog about Brain Health Panel

DOUG MUNOZ, President of the Canadian Association for Neuroscience

ANTHONY PHILLIPS, Director of the Institutes of Neuroscience, Mental Health and Addiction, CIHR

INEZ JABALPURWALA, President and CEO, Brain Canada

Representative from **NEUROLOGICAL HEALTH CHARITIES OF CANADA**

6:00 – 7:00 PM
Bayshore Ballroom Salon ABC

PRESIDENTIAL LECTURE

Sponsored by **THE ONTARIO BRAIN INSTITUTE**

MELVYN GOODALE, University of Western Ontario

How We See and Hear Stuff: Visual and Auditory Routes to Understanding the Material Properties of Objects

7:00 – 8:15 PM
Currents Restaurant / Pool,
Garden Area

OPENING RECEPTION (hosted)

ANNUAL CONFERENCE SCHEDULE

MONDAY, MAY 25, 2015

8:30 – 9:30 AM Bayshore Ballroom Salon ABC	PLENARY SYMPOSIUM Chair: MIRIAM SPERING , University of British Columbia <i>Seeing and moving: how the brain controls vision and gaze</i> BRIAN CORNEIL , Robarts RI <i>Through the looking glass: reflections of sensory and cognitive processing in the motor periphery</i> CHRISTOPHER PACK , McGill University <i>A sensorimotor role for oscillations in the visual cortex</i>
9:30 – 10:45 AM	COFFEE BREAK - Poster & Exhibit Hall
10:45– 11:00 AM	BRAIN STAR TALK - MARTIN MUNZ , McGill University
11:00 AM – 12:00 PM Bayshore Ballroom Salon ABC	FEATURED PLENARY SPEAKER MAYANK MEHTA , University of California, Los Angeles <i>From Virtual Reality to Reality: How Neurons Make Maps</i> Sponsored by CENTRE FOR NEUROSCIENCE STUDIES, QUEEN'S UNIVERSITY
12:00 – 1:30 PM	LUNCH ON OWN - Posters & Exhibits
	PARALLEL SYMPOSIA
1:30 – 3:00 PM Stanley Park Salon 1	SYMPOSIUM 1 <i>Glial handling of neuronal functions: from synapses to blood flow</i> Chair: RICHARD ROBITAILLE , Université de Montréal Speakers: STÉPHANE H. R. OLIET , Université de Bordeaux <i>Surface dynamics of the astrocytic glutamate transporter GLT-1</i> MARIE-ÈVE TREMBLAY , Université Laval <i>Microglial remodeling of neuronal circuits in the healthy brain</i> KEITH MURAI , McGill University <i>Neurons actively sustain the unique molecular and physiological properties of astrocytes in the adult brain through morphogen signaling pathways</i> HÉLÈNE GIROUARD , Université de Montréal <i>The astrocytic contribution to neurovascular coupling in health and disease</i>

ANNUAL CONFERENCE SCHEDULE

1:30 – 3:00 PM
Stanley Park Salon 2

SYMPOSIUM 2

Development and Processing of Vocal and Social Communication

Sponsored by **HOTCHKISS BRAIN INSTITUTE**

Chair: **STEPHEN LOMBER**, University of Western Ontario

Speakers:

YALE E. COHEN, University of Pennsylvania

Mechanisms Underlying Auditory Decision-Making

STEPHEN G. LOMBER, University of Western Ontario

Vocalization Processing Along a “What” Processing Pathway in Auditory Cortex

SARAH M.N. WOOLLEY, Columbia University

Neural Basis and Behavior of Social Communication

SUSAN A. GRAHAM, University of Calgary

Preschoolers’ Real-Time Processing of Vocal Emotional Information

1:30 – 3:00 PM
Stanley Park Salon 3

SYMPOSIUM 3

Shaping inhibition: new insights into the development and function of GABAergic inhibitory interneurons in the cortex

Chair: **SIMON CHEN**, University of California, San Diego

Speakers:

GRAZIELLA DI CRISTO, Université de Montréal

Mechanisms regulating GABAergic cell innervation fields in the adolescent brain

MELANIE WOODIN, University of Toronto

Inhibitory Synaptic Plasticity and Chloride Regulation in the Hippocampus

MINGSHAN XUE, Baylor College of Medicine

Inhibitory synapses equalize excitation-inhibition ratios across cortical neurons

SIMON CHEN, University of California, San Diego

Cell-type specific reorganization of inhibitory circuits during motor learning

1:30 – 3:00 PM
Cypress Room

SYMPOSIUM 4

Neural stem cells in cognitive repair and aging

Chair: **DAVID KAPLAN**, Hospital for Sick Children

Speakers:

DAVID KAPLAN, The Hospital for Sick Children

Introduction, and Long-term effects of maternal infection and diabetes on neural stem cell pools

LIISA GALEA, University of British Columbia

Estrogens, memory, neuroplasticity and aging: the good, the bad and the ugly

CINDI MORSHEAD, University of Toronto

Activating endogenous stem cells to promote brain repair and cognitive recovery

DONALD MABBOTT, The Hospital for Sick Children

Training the brain to repair itself

3:00 – 3:30 PM	COFFEE BREAK
3:30 – 5:30 PM	POSTERS & EXHIBITS – POSTER SESSION 1 Sponsored by SICK KIDS NEUROSCIENCES & MENTAL HEALTH PROGRAM
5:30 – 7:00 PM	PARALLEL SESSIONS Career Development Sessions of Potential Interest to All (choose your preference)
Stanley Park Salon 1	<i>Updates on Neuroscience Research Funding with representatives from NSERC and CIHR</i>
Stanley Park Salon 2	<i>How to Succeed in Careers in Academia</i>
7:00 – 8:00 PM Bayshore DEF	RECEPTION (non-hosted)
7:30 – 9:30 PM Mahoney & Sons Burrard Landing (1055 Canada Place, Unit #36)	CAN STUDENT SOCIAL Sponsored by Island Medical Program & Division of Medical Sciences, University of Victoria, University of British Columbia, and The Graduate Program in Neuroscience Canadian Society for Molecular Biosciences (CSMB)

TUESDAY, MAY 26, 2015

8:30 – 9:30 AM	PLENARY SYMPOSIUM <i>Plasticity, Pain, and Perception</i> Chair: JESPER SJÖSTRÖM , McGill University Speakers: LISA TOPOLNIK , Université Laval <i>Synaptic integration and plasticity gradients in dendrites of hippocampal inhibitory interneurons</i> MICHAEL SALTER , University of Toronto <i>From Receptors to Pain: The Molecular Dynamics of Pain</i>
9:30 – 10:45 AM	COFFEE BREAK – Poster & Exhibit Hall
10:45 – 11:00 AM	BRAIN STAR TALK - YING CHEN , York University
11:00 AM – 12:00 PM Bayshore Ballroom Salon ABC	FEATURED PLENARY SPEAKER KAREL SVOBODA , HHMI Janelia Farm Research Campus <i>Illuminating the neural circuits underlying tactile decisions</i>
12:00 – 12:30 AM Bayshore Ballroom Salon ABC	CAN-ACN ANNUAL GENERAL MEETING All CAN members invited to attend
12:30 – 1:30 PM	LUNCH ON OWN – Posters & Exhibits
	PARALLEL SYMPOSIA

ANNUAL CONFERENCE SCHEDULE

1:30 – 3:00 PM
Stanley Park Salon 1

SYMPOSIUM 5

Imaging brain complexity

Sponsored by **eNEURO**

Chair: **PAUL FRANKLAND**, The Hospital for Sick Children

Speakers:

KASPER PODGORSKI, Howard Hughes Medical Institute

Comprehensive 3D imaging of synaptic activity in the awake brain

MAJID MOHAJERANI, University of Lethbridge

In vivo optical imaging assessment of mouse cortical-hippocampal dialogue during sleep

PAUL FRANKLAND, The Hospital for Sick Children

Pharmacogenetic interrogation of a fear memory network

JI HYUN KO, University of Manitoba

Network analysis approach with metabolic PET imaging in neurodegenerative movement disorders

1:30 – 3:00 PM
Stanley Park Salon 2

SYMPOSIUM 6

Are you what you eat? Impact of diet on mesocorticolimbic circuit

Sponsored by **HOTCHKISS BRAIN INSTITUTE**

Chair: **STEPHANIE BORGLAND**, Hotchkiss Brain Institute

Speakers:

THIERRY ALQUIER, University of Montreal

Regulation of mesolimbic function, reward and feeding by lipids

CATHARINE WINSTANLEY, University of British Columbia

Steady-state consumption of a high-fat diet can decrease impulse control even in the absence of excessive weight gain

STEPHANIE BORGLAND, Hotchkiss Brain Institute

Compulsive eating reduces inhibitory control of pyramidal neurons of the lateral OFC

ALAIN DAGHER, McGill University

Brain Endophenotypes of Obesity

1:30 – 3:00 PM
Stanley Park Salon 3

SYMPOSIUM 7

Establishment and maintenance of cell diversity in sensory system function

Sponsored by **MONTREAL NEUROLOGICAL INSTITUTE**

Chair: **JEAN-FRANÇOIS CLOUTIER**, Montreal Neurological Institute

Speakers:

VALERIE WALLACE, Toronto Western

Notch and Hedgehog cross talk in neural progenitors converges on Gli2 activity

MICHEL CAYOUE, Institut de recherches cliniques de Montréal

A Conserved Regulatory Logic Controls Temporal Identity in Mouse Neural Progenitors

CHRISTOPHER DEPPMANN, University of Virginia

Molecular Rheostats Governing Sensory Perception

JEAN-FRANÇOIS CLOUTIER, McGill University

Cellular interactions in the control of neural progenitor cell differentiation

1:30 – 3:00 PM
Cypress Room

SYMPOSIUM 8
Homeostatic plasticity: molecular mechanisms and physiological function
Sponsored by **HOTCHKISS BRAIN INSTITUTE**
Chair: **GRAHAM DIERING**, John Hopkins University
Speakers:
DAVID STELLWAGEN, McGill University
TNF-mediated suppression of striatal reward dysfunction
JAIDEEP S. BAINS, Hotchkiss Brain Institute
State-dependent plasticity in stress circuits
SALVATORE CARBONETTO, McGill University
Dystroglycan Mediates Homeostatic Plasticity at GABAergic Synapses
GRAHAM DIERING, John Hopkins University
Homeostatic scaling-down of excitatory synapses during sleep

3:00 – 3:30 PM **COFFEE BREAK** – Poster & Exhibit Hall

3:30 – 5:30 PM **POSTERS & EXHIBITS - POSTER SESSION 2**
Sponsored by **The Society for Neuroscience**

5:30 – 6:00 PM **YOUNG INVESTIGATOR AWARD LECTURE**
Bayshore Ballroom Salon ABC **MICHAEL GORDON**, University of British Columbia
*Integrating taste modalities and motivation in the *Drosophila* brain*

6:00 – 7:00 PM **KEYNOTE LECTURE**
Bayshore Ballroom Salon ABC Sponsored by **Djavad Mowafaghian Centre for Brain Health**
CLAY REID, Allen Institute for Brain Science
Functional Connectomics at the Allen Institute

7:00 – 8:00 PM **RECEPTION** (non-hosted)
Bayshore DEF

WEDNESDAY, MAY 27, 2015

8:30 – 9:30 AM **PLENARY SYMPOSIUM**
Bayshore Ballroom Salon ABC Chair: **MICHAEL GORDON**, University of British Columbia
Sensorimotor processing in model systems
Speakers:
MEI ZHEN, University of Toronto
*The Development and Operation of the *C. elegans* Motor System*
DOUGLAS ALTSHULER, University of British Columbia
Visual motion perception in avian flight

9:30 – 10:45 AM **COFFEE BREAK** – Poster & Exhibit hall

10:45 – 11:00 AM **BRAIN STAR TALK - ROBERT P. BONIN**, Institut Universitaire en Santé Mentale de Québec

ANNUAL CONFERENCE SCHEDULE

11:00 AM – 12:00 PM
Bayshore Ballroom Salon ABC

FEATURED PLENARY SPEAKER
KRISTIN SCOTT, University of California, Berkeley
*Taste processing in *Drosophila**

12:00 – 1:30 PM **LUNCH ON OWN** – Posters & Exhibits

PARALLEL SYMPOSIA

1:30 – 3:00 PM
Stanley Park Salon 1

SYMPOSIUM 9
Regulatory mechanisms in cortical neurogenesis
Sponsored by **DEPARTMENT OF MEDICAL NEUROSCIENCE, DALHOUSIE UNIVERSITY**
Chair: **ANGELO IULIANELLA**, Dalhousie University
Speakers:
CAROL SCHUURMANS, University of Calgary
Cortical lineages are primed by the competing lineage determinants Neurog2 and Ascl1
STEFANO STIFANI, McGill University
Regulation of neurogenic and anti-neurogenic transcription factors during murine cortical neurogenesis
RUTH SLACK, University of Ottawa
Mitochondrial-mediated regulation of stem cell maintenance and cell fate decisions
DAVID PICKETTS, Ottawa Hospital Research Institute
Defining the role of chromatin remodeling proteins in balancing progenitor expansion with differentiation during cortical neurogenesis

1:30 – 3:00 PM
Stanley Park Salon 2

SYMPOSIUM 10
New insights into classical memory issues
Chair: **KARIM NADER**, McGill University
Speakers:
CATHARINE RANKIN, University of British Columbia
Rethinking habituation: New Insights into the Complexity of the Simplest Form of Learning
KARIM NADER, McGill University
Ongoing Protein Synthesis is Required to Enable Retrieval of Long Term Memories
VADIM BOLSHAKOV, McLean Hospital, Harvard Medical School
Diminishing fear by disrupting retrieval-induced synaptic restabilization
SATOSHI KIDA, Tokyo University of Agriculture
Erasure of recent and remote fear memory by enhancing forgetting through increase in adult hippocampal neurogenesis

1:30 – 3:00 PM
Stanley Park Salon 3

SYMPOSIUM 11

Linking nervous system development with function

Sponsored by **MONTREAL NEUROLOGICAL INSTITUTE**

Chair: **ARTUR KANIA**, Institut de recherches cliniques de Montréal

Speakers:

FREDA MILLER, Hospital for Sick Children

Understanding cognitive disorders: from neural stem cells to neurons

YING ZHANG, Dalhousie University

Distinctive developmental pathways of functional subpopulations of V3 interneurons in the mouse spinal cord

DOUGLAS ALLAN, University of British Columbia

*Genetic mechanisms underlying sexually dimorphic development of female-specific neural populations in *Drosophila**

EDWARD RUTHAZER, McGill University

How sensory experience controls circuit wiring in the developing visual system

1:30 – 3:00 PM
Cypress Room

SYMPOSIUM 12

Dysregulated synaptic plasticity in models of brain disorders

Sponsored by **TUCKER-DAVIS TECHNOLOGIES**

Chair: **ZHENGPING JIA**, The Hospital for Sick Children, University of Toronto

Speakers:

ÉRIC C. DUMONT, Queen's University

Altered plasticity at glutamate and GABA synapses in compulsive behaviours in rats

MIN ZHUO, University of Toronto

Aberrant synaptic plasticity and treatment in animal models of neuropathic pain and anxiety

MARJA D. SEPERS, University of British Columbia

Endocannabinoid-mediated synaptic plasticity at cortico-striatal synapses in the YAC128 model of Huntington's disease

GRAHAM L COLLINGRIDGE, University of Bristol

Dysregulated synaptic plasticity in models of Alzheimer's disease

– END OF MEETING –

PLENARY SYMPOSIA AND KEYNOTE SESSIONS

SUNDAY, MAY 24

PRESIDENTIAL LECTURE

MELVYN GOODALE, University of Western Ontario

How We See and Hear Stuff: Visual and Auditory Routes to Understanding the Material Properties of Objects

Sponsored by:

ONTARIO BRAIN INSTITUTE



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Almost all studies of object recognition, particularly in brain imaging, have focused on the geometric structure of objects (i.e. 'things'). Until recently, little attention has been paid to the recognition of the materials from which objects are made (i.e. 'stuff'), information that is often signalled by surface-based visual cues (the sheen of polished metal) as well as auditory cues (the sound of water being poured into a glass). But knowledge about stuff (the material properties of objects) has profound implications, not only for understanding what an object is, but also for the planning of actions, such as the setting of initial grip and load forces during grasping. In recent years, our lab has made some headway in delineating the neural systems that mediate the recognition of stuff (as opposed to things), not only in sighted people but also in blind individuals who use echoes from tongue clicks to recognize the material properties of objects they encounter. I will discuss evidence from both neuropsychological and fMRI studies demonstrating that lateral occipital regions in the ventral stream play a critical role in processing the 3-D structure and geometry of objects, whereas more anteromedial regions (particularly areas in the parahippocampal gyrus and collateral sulcus) are engaged in processing visual and auditory cues that signal the material properties of objects.

MONDAY, MAY 25

PLENARY SYMPOSIUM

Chair: MIRIAM SPERING, University of British Columbia

Seeing and moving: how the brain controls vision and gaze

BRIAN CORNEIL, Robarts Research Institute

Through the looking glass: reflections of sensory and cognitive processing in the motor periphery

The oculomotor system, which rapidly moves or stabilizes the line of sight, is one of the best-understood motor systems in the human brain. While this system is often studied via discrete saccadic eye movements made with the head restrained, orienting of the line of sight can be brought about by coordinated movements of the eyes, head, and body, and may also incorporate subtle changes in pupil diameter. A key oculomotor area is the superior colliculus (SC), which coordinates an ancient orienting reflex via outputs that distribute widely within the brainstem and spinal cord to saccadic and other premotor and autonomic circuits. There are key differences in the response properties of such downstream circuits, with saccadic circuits in particular

having the highest threshold for engagement. Because of such differences, non-saccadic circuits are, somewhat paradoxically, more responsive to subtle changes in upstream SC signaling. In my talk, I will illustrate how this framework provides a unifying explanation to a variety of curious findings, including short-latency neck and limb muscle recruitment time-locked to the onset of visual stimuli, the modulation of such responses with cognitive state, and the elaboration of non-saccadic responses following sub-threshold stimulation of the frontal cortex.

PLENARY SYMPOSIUM

CHRISTOPHER PACK, McGill University

A sensorimotor role for oscillations in the visual cortex

Brain activity is often observed to be oscillatory, meaning that it increases and decreases in strength at regular intervals. Oscillations at particular frequencies often vary in strength depending on a sensory stimulus or the cognitive state of the subject. As a result, oscillations have figured prominently into many models of brain function, particularly the hypothesis that oscillations provide a way to synchronize the timing of long-range communication across neural ensembles.

In this presentation I will focus on the spatial structure of oscillations measured via the local field potentials (LFP) in primate visual cortex. In particular I will discuss recent recordings from area V4 of monkeys implanted with chronic multi-electrode recording arrays. Our results show that there is a spatial pattern of oscillatory activity across retinotopic maps of visual space, and that this pattern is reorganized by the execution of saccadic eye movements. Saccade-related LFP patterns in turn seem to regulate the timing of single-neuron spiking activity, providing a possible basis for optimizing perisaccadic visual perception. I will suggest that well-known phenomena such as perisaccadic remapping, saccadic suppression, and saccadic momentum are consistent with a role for oscillations in linking oculomotor commands with visual processing.

FEATURED PLENARY SPEAKER

MAYANK MEHTA, UCLA

From Virtual Reality to Reality: How Neurons Make Maps

Sponsored by:

CENTRE FOR NEUROSCIENCE STUDIES, QUEEN'S UNIVERSITY



Numerous processes, in addition to the firing of action potentials, that are All animals move through space. What are the sensory and biophysical mechanisms that generate mental maps of space? How do these maps contribute to behavior? Despite tremendous progress these questions have not been fully resolved, partly because it is difficult to precisely measure, let alone manipulate, the wide range of sensory and motor variables that change when subjects move in space. Hence, we have developed a

noninvasive, immersive and multisensory virtual reality system where precisely controlled stimuli determine the surrounding virtual space, and nonspecific stimuli are spatially uninformative. We simultaneously measured rats' behavioral performance and the activities of thousands of neurons from the hippocampal circuit while rats performed complex tasks, including the Virtual Morris Water Maze task. We also developed computational techniques to decipher the emergent neural dynamics. This integrative, experiment-theory approach provided many surprising results. For example, when only the visual landmarks provide spatial information, more than half of hippocampal neurons shut down and the remaining active neurons are unable to form robust spatial maps, contrary to commonly held theories. Instead, additional multisensory cues are required to generate spatially selective activity. Indeed, inclusion of consistent locomotion cues generates spatial maps, but they encode relative distance traveled, not an allocentric representation of space. Theta rhythm too is significantly altered in virtual reality. We propose a "multisensory-pairing" hypothesis for hippocampal function where the entorhinal-hippocampal circuit forms rapid associations between multisensory stimuli using both cooperative and competitive mechanisms. This can explain the formation of diverse representations of space under different conditions.

TUESDAY, MAY 26

PLENARY SYMPOSIUM

Chair: **JESPER SJOSTROM**, McGill University

Plasticity, Pain, and Perception

MIKE SALTER, Sick Kids

From Receptors to Pain: The Molecular Dynamics of Pain

Neuron-microglial interactions are increasingly recognized as being key for physiological and pathological processes in the central nervous system. Microglia have been found to play a causal role in neuropathic pain behaviours resulting from peripheral nerve injury, and a core neuron-microglia-neuron signaling pathway has been elucidated. Within the dorsal horn, microglia suppress neuronal inhibition by a cascade involving activation of microglial P2X4 receptors causing the release of brain derived neurotrophic factor (BDNF). BDNF acts on trkB receptors which leads to a rise in intracellular chloride concentration in dorsal horn nociceptive output neurons, transforming the response properties of these neurons. In addition to suppressing inhibition, peripheral nerve injury causes activity-dependent facilitation at dorsal horn glutamatergic synapses which enhances nociceptive transmission. This enhancement is mediated by intracellular signaling networks involving serine/threonine and tyrosine kinases within nociceptive transmission neurons. Key for this enhancement is facilitation of NMDA receptor function by Src family tyrosine kinases. Recently we have discovered that microglia-to-neuron signaling is not only critical for pain hypersensitivity after peripheral nerve injury but also for the paradoxical hyperalgesic effect of morphine and other opioids. We anticipate that by targeting microglia-neuron signaling pathways new therapeutic strategies for chronic pain as well as its comorbid sequelae may be developed.

LISA TOPOLNIK, Université Laval

Synaptic integration and plasticity gradients in dendrites of hippocampal inhibitory interneurons

Hippocampal interneurons play a critical role in the spatiotemporal organization of principal cell assemblies and formation of memory fields. The synaptic mechanisms responsible for recruitment of distinct subtypes of interneurons in governing network activity are a matter of intense investigation, as it is still largely unknown how do interneurons integrate multiple inputs during specific brain states. In addition, understanding the mechanisms of multiple forms of synaptic plasticity experienced by interneurons and providing for functional segregation of GABAergic inputs converging onto principal cells remain an open question. Using two-photon microscopy and whole-cell patch-clamp recordings in combination with computational simulations, we have examined the mechanisms of synaptic integration and plasticity along a somatodendritic axis of hippocampal basket cells (BCs). Significant fluctuations in the summation of excitatory inputs through a variable contribution of GluA2-lacking AMPA vs NMDA receptors have been detected in dendritic branches of parvalbumin-positive BCs, with a direct impact on the synapse-specific integration and direction of long-term plasticity. In contrast, cholecystokinin-positive BCs have shown a variable gain function for excitatory inputs but also a somatodendritic gradient in the expression of Cav3.1 Ca²⁺ channels, which controlled LTP induction at inhibitory synapses. The lifetime of Ca²⁺ elevations in dendrites of BCs was critical in pacing down their activity through the cell type-specific induction of depression at excitatory or potentiation at inhibitory synapses. These data indicate that afferent inputs can differentially activate the two subtypes of BCs through the cell type- and input-specific dendritic mechanisms, providing for flexible recruitment of BCs during network activity.

FEATURED PLENARY SPEAKER

KAREL SVOBODA, HHMI Janelia Farm Research Campus

Illuminating the neural circuits underlying tactile decisions

Optical methods are revolutionizing our understanding of neural circuits. Cellular imaging allows measurements of coding of information in populations of defined cell types and subcellular structures. Optogenetic manipulations permit testing for causality of patterns of neural activity and behavior. We use these tools to dissect the circuit mechanisms underlying tactile decision making in behaving mice.

KEYNOTE LECTURE

CLAY REID, Allen Institute for Brain Science

Functional Connectomics at the Allen Institute

Sponsored by:

DJAVAD MOWAFAGHIAN CENTRE FOR BRAIN HEALTH



Djavad Mowafaghian
CENTRE FOR BRAIN HEALTH

PLENARY SYMPOSIA AND KEYNOTE SESSIONS

The current decade is emerging as golden age of neuroanatomy. Connectomics began was defined a decade ago, mostly as an aspiration for the future, but is likely to emerge as a mature field in this decade. In the first published use of the term (Sporns, Tononi, and Kotter, 2005 PLoS Comp Biol), it was recognized that connectomics should be considered on multiple scales, from the macroscale of entire brains to the microscale of individual synaptic connections between neurons. At the Allen Institute, we have begun a ten-year program to study the cerebral cortex of mice and humans. The mouse program, called MindScope, concentrates on the cortico-thalamic visual system and seeks to examine the computations that lead from visual input to behavioral responses. In this program, there is a strong emphasis on neuroanatomy, or connectomics at a macro- and microscale. Already a large-scale study of mesoscale connectivity in the mouse brain has been completed (Oh et al., 2014 Nature). Future work will include further mesoscale connectivity atlases that concentrate on the mouse visual system, as well as microscale connectivity of local cortical circuits. At a microscale, we have demonstrated that the relationship between structure and synaptic connectivity can be studied in local cortical circuits by combining in vivo physiology with subsequent network anatomy with electron microscopy (Bock et al., Nature, 2011; and subsequent studies), leading towards a functional connectome (Reid, 2012, Neuron). I will examine the near-term and long-term prospects for microscale connectomics and argue that connectomics at all scales must be combined with functional studies to fully exploit its great promise.

WEDNESDAY, MAY 27

PLENARY SYMPOSIUM

Chair: **MICHAEL GORDON**, University of British Columbia

Sensorimotor processing in model systems

MEI ZEN, University of Toronto

The Development and Operation of the *C. elegans* Motor System

Animals sense environments and respond with changes in motility. These sensorimotor behaviors are fundamental to life, and governed by nervous systems. All nervous systems undergo postnatal development, predicting changes in circuit connections. There is however surprisingly little understanding of how synaptic wiring changes, and how they affect behaviors during development.

In *C. elegans*, the 302 neuron adult nervous system was reconstructed by serial section electron microscopy (EM), yielding the first connectome for an entire animal. Yet the adult nervous system starts from 220 neurons at birth; the animal also grows fourfold in size, adding new glia, muscles and epidermis. Throughout postnatal development, the nervous system remains functional, even as new neurons, glia and non-neuronal partners integrate into existing circuits.

Combining EM, calcium imaging, optogenetics and molecular genetics, we are addressing how the growing nervous system remodels and regulates motor behaviors across development. Applying acquired insights on motor circuit function, we have further established relevant *C. elegans* models for human disorders, and applying them to address underlying physiological defects.

DOUGLAS ALTSHULER, University of British Columbia

Visual motion perception in avian flight

Flying birds use diverse sensory information to guide their flight, and the available evidence suggests that visual information plays a prominent role in flight control. For example, the avian midbrain in general, and the optic tectum in particular, are relatively much larger than homologous regions in other vertebrates. Although there is considerable information available about the neural circuitry for sensing and processing visual motion in birds, there is a major gap in our understanding of how motion perception is used during flight. Our research aims to unify electrophysiological and immunohistochemical investigations of neural circuitry with behavioural studies of visual guidance. We work with hummingbirds and zebra finches, which differ in flight behaviour and neuroanatomy but have fast wingbeat frequencies and similar muscle physiology. Our most recent work has demonstrated that hummingbirds are extraordinarily sensitive to global visual motion during hovering flight, even when the motion is small and displayed in the presence of prominent stationary features. Current research is focused on how visual motion processing guides other flight modes and flight mode transitions, and how cellular responses to visual motion differ across flight behaviours and species.

FEATURED PLENARY SPEAKER

KRISTIN SCOTT, UC Berkeley

Taste processing in *Drosophila*

The ability to identify food that is nutrient-rich and avoid toxic substances is essential for an animal's survival. Although olfaction and vision contribute to food detection, the gustatory system acts as a final checkpoint control for food acceptance or rejection. The fruit fly *Drosophila melanogaster* tastes many of the same stimuli as mammals and provides an excellent model system for comparative studies of taste detection. The relative simplicity of the fly brain and behaviors, along with the molecular genetic and functional approaches available in *Drosophila*, allow the examination of gustatory neural circuits from sensory input to motor output. We have utilized a combination of molecular, behavioral, and calcium imaging studies to determine the taste ligands that different gustatory neurons detect and how taste information is processed in the higher brain. More recently, we have begun to examine how hunger, satiety and learning influence activity in taste circuits and regulate feeding decisions. These studies provide insight into how taste compounds are detected and processed by the brain.

PARALLEL SYMPOSIA

Please note: the individual abstracts of all symposium presentations listed below are available on the CAN Conference App, and on the CAN-ACN website.

MONDAY, MAY 25

SYMPOSIUM 1: *Glial handling of neuronal functions: from synapses to blood flow*

Chair: **RICHARD ROBITAILLE**, Université de Montréal

Overview:

Glia are very dynamic cells that regulate a large variety of neuronal functions. This workshop will highlight some recent aspect of the dynamic and pluripotent roles that glial cells play in the regulation of various neuronal functions. This will span from the fine regulation of molecular organisation at synapses to the whole in vivo brain activity and functions. Stéphane Oliet will discuss the dynamic regulation of glutamate transporters in processes of astrocytes while Keith Murai will discuss the role of glial interactions in shaping dendritic spines. Marie-Eve Tremblay will discuss the interplay between astrocytes and microglial cells in the regulation of synapse elimination and Hélène Girouard will then discuss the regulation of blood flow by astrocytes as a function of neuronal activity. This would represent an opportunity to have a workshop regrouping young Canadian investigators (Girouard and Tremblay) with more senior researchers (Oliet and Murai).

Speakers:

STÉPHANE H. R. OLIET, Université de Bordeaux

Surface dynamics of the astrocytic glutamate transporter GLT-1

MARIE-ÈVE TREMBLAY, Université Laval

Microglial remodeling of neuronal circuits in the healthy brain

KEITH MURAI, McGill University

Imaging and augmenting collateral blood flow in the brain during acute ischemic stroke

HÉLÈNE GIROUARD, Université de Montréal

Seizures induce a severe ischemic/hypoxic episode

SYMPOSIUM 2: *Development and Processing of Vocal and Social Communication*

Chair: **STEPHEN LOMBER**, University of Western Ontario

Sponsored by:

HOTCHKISS BRAIN INSTITUTE



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BRAIN INSTITUTE**

Overview:

There is tremendous information carried in all vocalizations. For instance, we are very sensitive to human voices and can readily recognize others by listening to their voice. Our vocal inflections also have emotional content which relay how we feel, and what we hope to elicit in others. This means that our communication system is fundamentally a social one, and many other social animals share the basic properties of human vocal communication. This conceptual link allows us to study the communication systems in humans and other species. Recently, much progress has been made in understanding the neural mechanisms underlying various components of communication in both humans and non-human animals. These studies reveal how the brain extracts, represents, and encodes not only the physical features of a communication signal but also their perceptual representations and other abstract quantities (eg, semantic meaning). In this symposium, we will discuss new and exciting data that identify these important relationships across a variety of animals (songbirds, cats, monkeys, and humans) using an integrative approach of psychophysical, electrophysiological, and functional imaging techniques.

Speakers:

YALE E. COHEN, University of Pennsylvania

Mechanisms Underlying Auditory Decision-Making

STEPHEN G. LOMBER, University of Western Ontario

Vocalization Processing Along a "What" Processing Pathway in Auditory Cortex

PARALLEL SYMPOSIA

SARAH M.N. WOOLLEY, Columbia University

Neural Basis and Behavior of Social Communication

SUSAN A. GRAHAM, University of Calgary, Hotchkiss Brain Institute

Preschoolers' Real-Time Processing of Vocal Emotional Information

SYMPOSIUM 3: *Shaping inhibition: new insights into the development and function of GABAergic inhibitory interneurons in the cortex*

Chair: **SIMON CHEN**, University of California

Overview:

In the mammalian cortex, GABAergic inhibitory interneurons are remarkably diverse in terms of morphology, connectivity, and physiological properties. In addition to their recognized roles in maintaining the E/I balances, recent studies have suggested that different subtypes of inhibitory interneurons can be involved in sensory processing, learning and memory, and cognitive behavior. In this symposium, speakers will present data using a variety of approaches, including genetic manipulations, electrophysiology, optogenetics, and in vivo two-photon imaging to provide new insights into the development and function of GABAergic inhibitory interneurons. Dr. Graziella Di Cristo will discuss how neural activity regulates the innervations of cortical basket cells. Dr. Melanie Woodin will address the molecular mechanisms of synaptic plasticity of inhibitory synapses in the hippocampus. Dr. Mingshan Xue will move into in vivo system and show how different subtypes of interneurons equalize E/I ratios during visual processing. Dr. Simon Chen will focus on the role of subtype-specific reorganization of inhibitory circuits during motor learning in awake and behaving mice.

Speakers:

GRAZIELLA DI CRISTO, Université de Montréal

Mechanisms regulating GABAergic cell innervation fields in the adolescent brain

MELANIE WOODIN, University of Toronto

Inhibitory Synaptic Plasticity and Chloride Regulation in the Hippocampus

MINGSHAN XUE, Baylor College of Medicine

Inhibitory synapses equalize excitation-inhibition ratios across cortical neurons

SIMON CHEN, University of California

Cell-type specific reorganization of inhibitory circuits during motor learning

SYMPOSIUM 4: *Neural stem cells in cognitive repair and aging*

Chair: **DAVID KAPLAN**, Hospital for Sick Children

Overview:

An evolving body of work indicates that resident stem cells function to maintain and in some cases repair tissues. These findings have led to the idea that if we could recruit these stem cells, then we could enhance repair or regeneration. For example in rodents, exercise, learning, and enriched environment enhance, and stress and aging suppress neurogenesis or oligodendrogenesis. Here, Liisa Galea will present data on how estrogens affect hippocampus-dependent neuroplasticity and cognition and how reproductive experience moderates those effects in aging. Cindi Morshead will present on how metformin repairs stroke damage in postnatal mice by enhancing neurogenesis. Don Mabbott will talk about his recent findings (in review in New Eng J Med) on how exercise greatly improves cognition and increases hippocampal volume and white matter in children with brain injuries. David Kaplan will provide a short overview and short talk on maternal influences on adult neurogenesis in progeny.

Speakers:

DAVID KAPLAN, The Hospital for Sick Children

Introduction, and Long-term effects of maternal infection and diabetes on neural stem cell pools

LIISA GALEA, University of British Columbia

Estrogens, memory, neuroplasticity and aging: the good, the bad and the ugly

CINDI MORSHEAD, University of Toronto

Activating endogenous stem cells to promote brain repair and cognitive recovery

DONALD MABBOTT, The Hospital for Sick Children

Training the brain to repair itself

TUESDAY, MAY 26

SYMPOSIUM 5: *Imaging brain complexity*

Chair: **PAUL FRANKLAND**, The Hospital for Sick Children

Sponsored by:

eNEURO



Overview:

The brain is a complex organ, containing billions of neurons, each connected through synapses to several thousand other neurons. Therefore an appreciation of how the brain works necessarily involves understanding how information is integrated both in individual neurons, as well as across brain regions. This symposium brings together 4 Canadian researchers tackling this complexity at both the micro- and macroscales. Using new tools to image dendritic activity at high speed in vivo, Podgorski will show how sensory inputs are integrated in a single neuron in the developing *Xenopus*. Frankland has developed whole brain activity dependent mapping approaches in mice, and used graph theoretical approaches to define functional networks engaged by fear memory. Mohajerani has developed voltage-sensitive dye wide-field imaging approaches to investigate hippocampal-cortical interactions during sleep. Ko uses FDG-PET in patients with movement disorders, and will present graph theoretical analyses to understand the underlying cause of aberrant network activity.

Speakers:

KASPER PODGORSKI, Howard Hughes Medical Institute

Comprehensive 3D imaging of synaptic activity in the awake brain

MAJID MOHAJERANI, University of Lethbridge

In vivo optical imaging assessment of mouse cortical-hippocampal dialogue during sleep

PAUL FRANKLAND, The Hospital for Sick Children

Pharmacogenetic interrogation of a fear memory network

JI HYUN KO, University of Manitoba

Network analysis approach with metabolic PET imaging in neurodegenerative movement disorders

SYMPOSIUM 6: *Are you what you eat? Impact of diet on mesocorticolimbic circuit*

Chair: **STEPHANIE BORGLAND**, Hotchkiss Brain Institute

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Overview:

Obesity can be viewed as a disorder of decision-making. Feeding is not only governed by homeostatic energy signals, but also by stress, variety and availability of low cost calorically dense foods, habitual factors and even previous diet that govern our decisions of what and when to consume. This symposium will explore the neurobiological mechanisms of how diet can influence our feeding behavior. Dr. Fulton will demonstrate that lipid type can influence signaling and behavior within the mesolimbic system. Dr. Winstanley will demonstrate that impulse control is affected in rats consuming a high fat diet. Dr. Borgland will demonstrate that a cafeteria diet promotes compulsive eating and dysfunction in the orbitofrontal cortex. Finally, Dr. Dagher will show functional imaging data on decision-making, food valuation, and appetite control as they relate to weight gain in humans. Together, this symposium will implicate diet-induced alterations in the mesocorticolimbic system resulting in changes in ingestive behaviour.

PARALLEL SYMPOSIA

Speakers:

THIERRY ALQUIER, University of Montreal

Regulation of mesolimbic function, reward and feeding by lipids

CATHARINE WINSTANLEY, University of British Columbia

Steady-state consumption of a high-fat diet can decrease impulse control even in the absence of excessive weight gain

STEPHANIE BORGLAND, Hotchkiss Brain Institute

Compulsive eating reduces inhibitory control of pyramidal neurons of the lateral OFC

ALAIN DAGHER, McGill University

Brain Endophenotypes of Obesity

SYMPOSIUM 7: *Establishment and maintenance of cell diversity in sensory system function*

Chair: **JEAN-FRANÇOIS CLOUTIER**, Montreal Neurological Institute

Sponsored by:

MONTREAL NEUROLOGICAL INSTITUTE AND HOSPITAL



Overview:

The degeneration of neurons in sensory systems and their associated pathologies, such as loss of vision and olfaction, represent a growing problem in our aging population. The development of stem cell based regenerative therapies in sensory systems requires a fundamental understanding of the molecular mechanisms underlying the generation and function of these neurons. This symposium will describe how both intrinsic and environmental factors impinge on the generation and function of neurons in the visual, olfactory, and somatosensory systems. Dr. Cayouette will present a novel transcriptional cascade controlling temporal identity progression in retinal progenitor cells and how it might improve strategies for cell replacement therapy. Dr. Wallace will discuss the importance of maintaining morphogen responsiveness for the production of neurons in the retina. Dr. Deppmann will discuss the function of TNF receptor family members in the formation of somatosensory neurons and their importance for proprioception and touch sensation. Dr. Cloutier will describe how cell-cell interactions influence both the generation and survival of sensory neurons in the olfactory epithelium.

Speakers:

VALERIE WALLACE, Toronto Western

Notch and Hedgehog cross talk in neural progenitors converges on Gli2 activity

MICHEL CAYOUE, Institut de recherches cliniques de Montréal

A Conserved Regulatory Logic Controls Temporal Identity in Mouse Neural Progenitors

CHRISTOPHER DEPPMANN, University of Virginia

Molecular Rheostats Governing Sensory Perception

JEAN-FRANÇOIS CLOUTIER, McGill University

Cellular interactions in the control of neural progenitor cell differentiation

SYMPOSIUM 8: Homeostatic plasticity: molecular mechanisms and physiological function

Chair: **GRAHAM DIERING**, John Hopkins University

Sponsored by:

HOTCHKISS BRAIN INSTITUTE



**HOTCHKISS
BRAIN INSTITUTE**

Overview:

Synapses have the capacity to alter their strength in a process called synaptic plasticity. Plasticity can occur at individual synapses in the form of LTP and LTD, forming the cellular basis of learning and memory, or more globally during homeostatic plasticity in order to regulate neuronal firing rates and network activity. Homeostatic plasticity was originally described as a scaling of excitatory synapses. Recent investigations have shown that homeostatic plasticity involves different synapse types, occurs over different spatial scales and in multiple brain regions. Despite advances in understanding the molecular mechanisms underlying homeostatic plasticity, its impact on information processing or on learning and memory through interaction with LTP/LTD remain largely unknown. This symposium will highlight the various forms and functions of homeostatic plasticity, including plasticity of excitatory and inhibitory synapses, the involvement of glia, and the role of this plasticity type in different physiological states such as inflammation, stress and sleep.

Speakers:

DAVID STELLWAGEN, McGill University

TNF-mediated suppression of striatal reward dysfunction

JAIDEEP S. BAINS, Hotchkiss Brain Institute

State-dependent plasticity in stress circuits

SALVATORE CARBONETTO, McGill University

Dystroglycan Mediates Homeostatic Plasticity at GABAergic Synapses

GRAHAM DIERING, John Hopkins University

Homeostatic scaling-down of excitatory synapses during sleep

WEDNESDAY, MAY 27

SYMPOSIUM 9: Regulatory mechanisms in cortical neurogenesis

Chair: **ANGELO IULIANELLA**, Dalhousie University

Sponsored by:

DEPARTMENT OF MEDICAL NEUROSCIENCE, DALHOUSIE UNIVERSITY



**DALHOUSIE
UNIVERSITY**

Medicine

Department of Medical Neuroscience

Overview:

The regulation of neurogenesis in the developing cerebral cortex is highly dynamic and complex, being influenced by gene regulatory programs interacting with epigenetic mechanisms to establish cell fates. The symposium will open with a lecture from Dr. Carol Schuurmans (University of Calgary) on her recent findings concerning the role of the proneural factors Neurog2 and Ascl1 in priming cell lineage selection in the neocortex. This will be followed by a lecture by Dr. Stefano Stifani (McGill University) on mechanisms that antagonize the functions of proneural factors during cortical neurogenesis and regulate the transition from neurogenesis to gliogenesis. The third lecture by Dr. Ruth Slack (University of Ottawa) will highlight recent findings that mitochondrial function impinges on cortical cell fate decisions. The final talk of the session by Dr. David Picketts (Ottawa Hospital Research Institute) will discuss the crucial role of chromatin remodelling in balancing cortical progenitor proliferation with differentiation.

Speakers:

CAROL SCHUURMANS, University of Calgary

Cortical lineages are primed by the competing lineage determinants Neurog2 and Ascl1

STEFANO STIFANI, McGill University

Regulation of neurogenic and anti-neurogenic transcription factors during murine cortical neurogenesis

PARALLEL SYMPOSIA

RUTH SLACK, University of Ottawa

Mitochondrial -mediated regulation of stem cell maintenance and cell fate decisions

DAVID PICKETTS, Ottawa Hospital Research Institute

Defining the role of chromatin remodeling proteins in balancing progenitor expansion with differentiation during cortical neurogenesis

SYMPOSIUM 10: *New insights into classical memory issues*

Chair: **KARIM NADER**, McGill University

Overview:

This symposium brings together a group of internationally renowned researchers who study cutting edge issues in memory processing. The talks will discuss issues involved from simple to complex systems. Specifically, using wild-type and mutant strains of *c. elegans*, Prof. Rankin explores nuanced issues on the molecular neurobiology of memory consolidation mechanisms. Using a technique that enables single cell resolution over brain areas, Prof. Sauvage will discuss the specific areas implicated within the medial temporal lobe mediating memory tasks. Prof. Bolshakov will discuss a completely new finding in neuroplasticity. All previous work has shown that the molecular and cellular correlates induced by learning are reversed when amnesia is induced. Prof. Bolshakov found that learning induced changes in pre-synaptic efficacy. Surprisingly, he found that reconsolidation blockade led to a reduction in the post-synaptic mechanisms but spared the pre-synaptic changes induced by learning. The pioneering work in forgetting by Prof. Kida shows that forgetting is a neurobiologically conserved phenomenon and not brain dysfunction as commonly believed.

Speakers:

CATHARINE RANKIN, University of British Columbia

Rethinking habituation: New Insights into the Complexity of the Simplest Form of Learning

KARIM NADER, McGill University

Ongoing Protein Synthesis is Required to Enable Retrieval of Long Term Memories

VADIM BOLSHAKOV, McLean Hospital, Harvard Medical School

Diminishing fear by disrupting retrieval-induced synaptic restabilization

SATOSHI KIDA, Tokyo University of Agriculture

Erasure of recent and remote fear memory by enhancing forgetting through increase in adult hippocampal neurogenesis

SYMPOSIUM 11: *Linking nervous system development with function*

Chair: **ARTUR KANIA**, Institut de recherches cliniques de Montréal

Sponsored by:

MONTREAL NEUROLOGICAL INSTITUTE



Overview:

Nervous system developmental mechanisms have been studied for many years now, but their precise link to specific neural circuit functions remains unclear. Considering the high number of neurological disorders that arise because of developmental defects, this symposium seeks to link specific developmental events and aspects of neural circuit function. We will present evidence tying the molecular specification of spinal interneuron subclasses to locomotor circuits. We will discuss the impact of developmental sensory experience on the connectivity and function of the vertebrate visual system. We will discuss the dimorphic cellular and genetic mechanisms that direct the formation of a sex-specific neuronal circuit required in females for reproduction. Finally, we will explore how molecular mechanisms controlling neuronal stem cell development contribute to the function of cognitive neural circuits. The emergent theme of this symposium is that linking developmental processes with circuit function is essential to understanding neurodevelopmental disorders.

Speakers:

FREDA MILLER, Hospital for Sick Children

Understanding cognitive disorders: from neural stem cells to neurons

YING ZHANG, Dalhousie University

Distinctive developmental pathways of functional subpopulations of V3 interneurons in the mouse spinal cord

DOUGLAS ALLAN, University of British Columbia

*Genetic mechanisms underlying sexually dimorphic development of female-specific neural populations in *Drosophila**

EDWARD RUTHAZER, McGill University

How sensory experience controls circuit wiring in the developing visual system

SYMPOSIUM 12: Dysregulated synaptic plasticity in models of brain disorders

Chair: **ZHENGPIG JIA**, The Hospital for Sick Children, University of Toronto

Sponsored by:

TUCKER DAVIS TECHNOLOGIES



Overview:

Synaptic plasticity is a fundamental neural process critical for brain development and function. Dysregulations in synaptic plasticity are closely associated with many neurological and mental disorders, including Alzheimer's disease (AD), Huntington's disease (HD), Neuropathic pain and drug abuse, which represent a major burden to our society. Therefore, investigating synaptic plasticity and how it is altered in these brain disorders is a key to the understanding and treatment of these diseases. In this symposium, we will bring together leading researchers working on synaptic plasticity in various animal models of brain disorders; Dr. Dumont will present studies on compulsive behaviors in rats including compulsive drug intake, Dr. Min on neuropathic pain, Dr. Sepers on transgenic models of HD, and Professor Collingridge on current state of synaptic plasticity and mechanisms underlying synaptic degeneration that is a core feature of AD. Therefore, the proposed symposium will be timely and of interest to a wide range of audience.

Speakers:

ÉRIC C. DUMONT, Queen's University

Altered plasticity at glutamate and GABA synapses in compulsive behaviours in rats

MIN ZHUO, University of Toronto

Aberrant synaptic plasticity and treatment in animal models of neuropathic pain and anxiety

MARJA D. SEPERS, University of British Columbia

Endocannabinoid-mediated synaptic plasticity at cortico-striatal synapses in the YAC128 model of Huntington's disease

GRAHAM L COLLINGRIDGE, University of Bristol

Dysregulated synaptic plasticity in models of Alzheimer's disease

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Session 2: Tuesday May 26
9:30 - 10:45 & 3:30 - 5:30

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Session – Theme – Board number (E.g 1-A-85)

Location of the individual poster boards indicated on poster board floor plans at the back of the handbook.

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- B Neural Excitability, Synapses, and Glia: Cellular Mechanisms**
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A – Development

1-A-1 Lipid mediator prostaglandin E2 alters calcium homeostasis during neuronal differentiation in neuroectodermal stem cells

Jennilee Davidson¹, Hongyan Li¹, Dorota Crawford¹

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1-A-2 Spatio-Temporal Heterogeneity of the Spinal Cord Central Canal

Kathryn Douglas¹, Dongho Lee¹, Jane Roskams¹

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1-A-3 The Role of Activator E2Fs in Stem Cell Maintenance during Neurogenesis

Raghda Gema¹, Mireille Khacho¹, Alysén Clark¹, Kristen Stevens¹, David Park¹, Ruth Slack¹

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1-A-4 Hoxb8 intersection defines a role for Lmx1b in excitatory dorsal horn neuron development, spinofugal connectivity and nociception

Nora Szabo¹, Ronan V. da Silva¹, Susana G. Sotocinal², Hanns Ulrich Zeilhofer³, Jeffrey S. Mogil², Artur Kania¹

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1-A-5 Docosahexaenoic acid status and neurodevelopment at birth are comparable in controls and neonates born to well-controlled gestational diabetes mellitus

Pauline Léveillé¹, Jean-Luc Ardlouze³, Jean-Charles Pasquier², Charles Deacon², Kevin Whittingstall², Mélanie Plourde²

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1-A-7 The Effect of Microglia on Progenitor Cells During Tuberal Hypothalamic Development

Candace Marsters¹

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1-A-8 In Situ Imaging of Intracellular Axon Guidance Signaling

Daniel Morales¹, Artur Kania¹

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1-A-9 Neuronal activity of surrounding axons instructs retinal ganglion cell axon growth in the *Xenopus laevis* visual system

Martin Munz¹, Tasnia Rahman¹, Edward Ruthazer¹

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1-A-10 Imaging the longitudinal development of structural sex differences in the mouse brain using in vivo manganese enhanced magnetic resonance imaging

Lily Qiu¹, Kamila Szulc², Brian Nieman², Sharon Portnoy¹, Daniel Turnbull³, Mark Palmert¹, Jason Lerch²

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1-A-11 AF1Q Interacts with TCF7 to Facilitate Neural Stem Cell Proliferation

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1-A-12 Identification of a novel interaction between Pannexin 1 and Collapsin response mediator protein 2 that regulates neuronal development

Esther Carmona-Wagner¹, Leigh Anne Swayne¹

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1-A-13 Autocrine/paracrine control of neural precursors: an integrated proteomic and transcriptomic approach for defining the cortical precursor niche

Scott Yuzwa¹, Geoff Clarke², Peter Zandstra², David Kaplan¹, Freda Miller¹

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B - Neural Excitability, Synapses, and Glia: Cellular Mechanisms

1-B-14 Acute Actions of Gabapentinoids on Neuropathic Spinal Cord Slices: Preferential Actions on Excitatory Neurons

Sascha Alles¹, Nataliya Bukhanova¹, Peter Smith¹

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1-B-15 Projection-target dependent effects of orexin and dynorphin on VTA dopamine neurons

Corey Baimel¹, Stephanie Borgland², Jennifer Thompson³

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1-B-16 Two-photon optogenetics for controlling PDE activity in living neurons

Fiona Bergin¹, Kenichi Okamoto¹

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1-B-17 Microglia rapidly adopt a filopodia-rich phenotype upon oxygen depletion by sensing tissue acidosis

Louis-Philippe Bernier¹, Lasse Dissing-Olesen¹, Jasmin Hefendehl¹, Jeffrey LeDue¹, Brian MacVicar¹

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1-B-19 Activity-Regulated Trafficking of the Palmitoyl-Acyl Transferase DHHCS

Stefano Brigidi¹, Brendan Santyr¹, Jordan Shimell¹, Blair Jovellar¹, Shernaz Bamji¹

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1-B-20 Mitochondria regulation of neuronal structural and functional plasticity

Janaina Brusco¹, Serhiy Opushnyev¹, Kurt Haas¹

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1-B-21 Scavenging reactive oxygen species initiates GABA A receptor-mediated electrical suppression in anoxia-tolerant turtle neurons

Leslie Buck¹, David Hogg¹

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1-B-22 Regulation of Chloride Homeostasis by NMDA Receptors

Jonah Chevrier¹, Vivek Mahadevan¹, Melanie Woodin¹

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1-B-23 Heterogeneous populations of neural stem progenitor cells and astrocytes express brain lipid binding protein in aged human neurogenic niches
*Athena Chou*¹, Jane Roskams¹

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1-B-24 Nicotinic receptor signaling in principal neurons of the mouse hippocampal formation during postnatal development
*Beryl Chung*¹, Derek Jacklin¹, Warren Bignell¹, Boyer Winters¹, Craig Bailey¹

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1-B-25 Inhibitory Synaptic Transmission and KCC2 Function in the Brain of Huntington's Disease
*Zahra Dargaei*¹, Melanie Woodin¹

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1-B-26 Homeostatic scaling of excitatory synapses during sleep
*Graham Diering*¹, Raja Nirujogi¹, Paul Worely¹, Akhilesh Pandey¹, Richard Hugarir¹

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1-B-27 Identification of Na⁺/H⁺ exchanger as a possible second target for Bactridine 2

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1-B-28 Altered TORC1-dependent protein synthesis dysregulates the excitatory-inhibitory balance and dendritic branching in vivo

*Delphine Gobert*², Anne Schohl², Edward Ruthazer²

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1-B-29 Calcium Responses to Single Action Potentials in Spinal Cord Lamina I Neurons are Mediated by T-Type VGCCs
*Erika Harding*¹, Michael Salter¹

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1-B-30 Anoxic regulation of mitochondrial membrane potential and ROS production leads to electrical suppression in turtle cerebral cortex

*Peter Hawrysh*¹, David Hogg¹, Les Buck¹

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1-B-31 Serine 863 regulates surface expression of GluA1 and is Phosphorylated by PAK3

*Natasha Hussain*¹, Gareth Thomas², Richard Hugarir¹

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1-B-32 Interactions between excitatory synapse proteins and KCC2 influence KCC2 function and GABAergic inhibition
*Sahara Khademullah*¹, Vivek Mahadevan¹, Melanie Woodin¹

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1-B-33 Modulation of PTEN/mTOR pathway through Ndfip1 over-expression promotes neuronal survival and regeneration following injury

*Mohamad Khazaei*¹, Michael Fehlings²

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1-B-34 Activity-dependent and bi-directional plasticity of glutamate synapses on striatal projection neurons in cortico-striatal co-cultures.

*Naila Kuhlmann*¹, Li-Ping Cao¹, Austen Milnerwood¹

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1-B-35 Spatiotemporal transformations of local calcium dynamics during clustered synapse development

*Kevin Lee*¹, Cary Soares¹, Jean-Philippe Thivierge¹, Jean-Claude Béïque¹

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1-B-36 Short-term consumption of high fat food increases long lasting excitatory synaptic transmission onto VTA dopamine neurons

*Shuai Liu*¹, Andrea Globa², Fergil Mills², Shernaz Bamji², Stephanie Borgland¹

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1-B-37 The ciliary gene, EFHC1, implicated in human epilepsy, modulates dopamine signalling in C. elegans

*Catrina Loucks*¹, Andrea McEwan², Chunmei Li¹, Jacque-Lynne Johnson¹, Catharine Rankin², Michel Leroux¹

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1-B-38 Optogenetic control of second messenger dynamics in dendritic spines during synaptic plasticity using a two-photon approach

*Thomas Luyben*¹, Jelena Borovac¹, Fiona Bergin¹, Megan Valencia¹, Mustafa Khan¹, Kenichi Okamoto¹

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1-B-39 Sex differences in the involvement of spinal P2X4 receptors and BDNF in pain hypersensitivity induced by peripheral nerve injury

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1-B-40 Enhanced thalamic GABAAR-mediated spill-over inhibition elicits anesthetic-like changes in electrocortical activity that do not require T-type Ca²⁺ channel activation
*Lia Mesbah-Oskui*¹, Richard Horner¹

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1-B-41 cAMP-dependent protein kinase inhibits $\alpha 7$ nicotinic receptor activity in layer 1 cortical interneurons through activation of D1/D5 dopamine receptors

*Raad Nashmi*¹, Pragma Komal¹, Anthony Renda¹, Raad Nashmi¹

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1-B-42 Norepinephrine Protects Synapses from Depotentiation by Priming Translation-Dependent LTP.

*Sean Rah*¹, Saby Maity¹, Peter Nguyen¹

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1-B-43 IKCa channels are a critical determinant of the slow AHP in hippocampus

*Brian King*¹, Arsalan Rizwan¹, Hadhimulya Asmara¹, N. Colin Heath¹, Jordan Engbers¹, Steven Dykstra¹, Theodore Bartoletti¹, Shahid Hameed¹, Gerald Zamponi¹, Ray Turner¹

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1-B-44 Effects of wild-type and mutant huntingtin on the in vitro corticostriatal synapse

*Mandi Schmidt*¹, Matthew Parsons¹, Caodu Buren¹, Shaun Sanders¹, Lynn Raymond¹, Michael Hayden¹

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1-B-45 Homeostatic influence on Hebbian plasticity rules at central synapses

*Cary Soares*¹, Jean-Claude Béïque¹

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1-B-46 Control of trauma-induced epileptogenesis in mice and its age dependency

*Sara Soltani*¹, Josée Seigneur¹, Sylvain Chauvette¹, Igor Timofeev¹

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1-B-47 Identifying sources of study-to-study variability in neuronal electrophysiology data

*Dmitrii Tebaikin*¹, Dmitrii Tebaikin¹, Shreejoy Tripathy¹, Paul Pavlidis¹

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1-B-48 A brain-wide analysis of neuronal transcriptomic and electrophysiological diversity

*Shreejoy Tripathy*¹, Dmitrii Tebaykin¹, Ogan Mancarci¹, Lilah Toker¹, Paul Pavlidis¹

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1-B-49 Mild traumatic brain injury produces more immediate and prolonged LTP deficits in the juvenile female brain

*Emily White*¹, Jessica DeVries¹, Jennifer Graham¹, Sean Kennedy¹, Crystal Bostrom¹, Brian Christie¹

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1-B-50 APP facilitates the RCAN1-mediated apoptosis

*Yili Wu*¹, Yu Deng¹, Shuting Zhang¹, fang cai¹, weihui zhou¹, tingyu li¹, weihong song¹

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1-B-51 Cannabinoid receptor 1 and Somatostatin receptor subtypes colocalization in rat brain

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C - Disorders of the Nervous System

1-C-52 Dopamine terminals mediate vesicular release of L-DOPA-evoked enhancement of dopamine in the 6-OHDA lesioned striatum.

*Soyon Ahn*¹, Bonita Ma¹, Anthony Phillips¹

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1-C-53 In ALS, misfolded wtSOD1 induced by pathological FUS or TDP-43 transmits intercellularly and is propagated misfolding-competent

*Edward Pokrishevsky*¹, Leslie Grad¹, Neil Cashman¹

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1-C-54 Rauwolfia vomitoria root extract improves behaviour and provides region-specific reduction in A β plaque coverage in the 5xFAD mouse model of Alzheimer's Disease.

*Katerina Allan*¹, Sunday Agba Bisong Sultan Darvish¹, Richard Brown¹

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1-C-55 Neuroanatomical and microstructural differences in the brain of a Mecp2 mouse model of Rett syndrome

*Rylan Allemang-Grand*², Jacob Ellegood², Jason Lerch²

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1-C-56 Age-related changes in frailty in the 3xTgAD and 5xFAD mouse models of Alzheimer's disease

*Sooyoun Shin*¹, Richard Brown¹

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1-C-57 Effects of uncoupling 2B-NMDA receptors from PSD-95 by Tat-NR2B9c in Huntington's disease corticostriatal co-culture

*Caodu Buren*¹, Lynn Raymond¹

¹The University of British Columbia

1-C-58 The Small RNA Molecule miR-16-5p is an Early Biomarker of Neurodegeneration and a Potential Target for Therapy in Prion Disease

*Kristyn Campbell*¹, Yulian Niu², Stephanie Booth¹

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1-C-59 Two unique activities in the brain of Parkinson's disease model rats: High-Voltage-Spindles and Beta-Oscillation

*Chi-Fen Chuang*¹

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1-C-60 Neurophysiologic response to bilateral vs. unilateral therapy for chronic stroke patients with varying degrees of motor impairment

*David Cunningham*¹, Jayme Knutson², Kelsey Potter-Baker¹, Vishwanath Sankarasubramanian¹, Nicole Varnerin¹, Corin Bonnett¹, Andre Machado¹, Ela Plow¹

¹Cleveland Clinic, ²MetroHealth Medical Center

1-C-61 Parkinson's disease targets intrinsic brain networks

*Yashar Zeighami*¹, Yashar Zeighami¹, Miguel Ulla², Yasser Iturria-Medina¹, Mahsa Dadar¹, Kevin Larcher¹, Douglas Collins¹, Alan Evan¹, Alain Dagher¹

¹Montreal Neurological Institute, McGill University, ²Centre Hospitalier Universitaire de Clermont-Ferrand

1-C-62 Striking differences in the neuroanatomical phenotype of the Neuroligin3 R451C knock-in and the Neurexin1a knock-out.

*Jacob Ellegood*¹, Felipe Espinosa-Becerra², Mehreen Kouser², Zhong Xuan², Craig Powell², Jason Lerch¹

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1-C-63 VIP interneuron re-modelling during stroke recovery.

*Kimberly Gerrow*¹, Craig Brown¹

¹University of Victoria

1-C-64 Novel motor cortical output pathways following spinal cord injury despite extensive corticospinal loss revealed by optogenetic mapping

*Brett Hilton*¹, Eitan Anenberg¹, Thomas Harrison¹, Jamie Boyd¹, Timothy Murphy¹, Wolfram Tetzlaff¹

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1-C-65 Behavioural comorbidities related to psychiatric disorders in a rat model of absence epilepsy: effects of the T-type calcium channel blocker Z944

John Howland¹, Wendie Marks¹, Mary Cavanagh¹, Quentin Greba¹,
*Stuart Cain*², Terrance Snutch³

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British Columbia

**1-C-66 Thioresoxin system modulates neural stem cell
proliferation and differentiation: Implication on Neurotrauma
treatment**

*Mohamed Ariff Iqbal*¹, Alysa Almoujela¹, Eftekhara Eftekharpour¹

¹University of Manitoba

**1-C-67 The role of eukaryotic elongation factor-2 kinase (eEF2K)
activity in Alzheimer's disease pathogenesis and relevance for
novel therapies.**

*Asad Jan*², Gabriel Lepruvier², Syam Prakash², Milene Vandal³, Frederic
Calon³, Michael Hayden¹, Poul Sorensen¹

¹University of British Columbia, ²BC Cancer Research Centre, ³University of
Laval

**1-C-68 Characterization of AMPAR surface recycling and
synaptic transmission in a novel D620N knock-in mouse model of
Parkinson's disease.**

*Chelsie Kadgien*¹, Lise Munsie¹, Igor Tatarnikov¹, Li Ping Cao¹, Austen
Milnerwood¹, Matthew Farrer¹

¹University of British Columbia

**1-C-69 Alcohol tolerance & histone modifications: histone
methylation plays a role in altered response to second alcohol
exposure**

*Conny Lin*¹, James Shih¹, Ankie Hung¹, Ashvini Sunthoram¹, Catharine
Rankin¹

¹University of British Columbia

**1-C-70 Assessment of attention behaviour and cholinergic
signaling in male mice following developmental ethanol
exposure.**

*Emma Louth*¹, Warren Bignell¹, Christine Taylor¹, Craig Bailey¹

¹University of Guelph

**1-C-71 Investigation of --alpha-synuclein phenotype in primary
cortical cultures from LRRK2 knockout mice**

*Sarah MacIsaac*¹

¹University of British Columbia

**1-C-72 Assembly of the mammalian palmitoylome indicates a
pivotal role for palmitoylation in diseases and disorders of the
nervous system**

*Dale Martin*¹, Shaun Sanders¹, Stefanie Butland¹, Mathieu Lavallée-
Adam², Diego Calzolari³, Chris Kay¹, John Yates³, Michael Hayden¹

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Research Institute

**1-C-73 Isolated and combined effects of early-enriched
environment and treadmill walking in a model of cerebral palsy
in rats: motor behavior aspects**

*André Meireles*¹, Marília Marques¹, Chistiano Spindler¹, Ethiane
Segabinazi¹, Francele Piazza¹, Otávio Augustin¹, Gabriela Salvalaggio¹,
Simone Marcuzzo¹

¹Federal University of Rio Grande do Sul

**1-C-74 Restoring ability to form new, and recover old "lost",
memories in mice that model Alzheimer's disease**

*Valentina Mercaldo*¹, Adelaide Yiu¹, Asim Rashid¹, Derya Sargin²,

Jeimmy Marcela Cerón González², Daniel Morrison¹, Paul Frankland¹,
Sheena Josselyn¹

¹Hospital for Sick Children, ²University of Toronto

**1-C-75 -NMDA R/+VDR Pharmacological Phenotype as a Novel
Therapeutic target in Relieving Motor-Cognitive Impairments in
Parkinsonism**

*Olalekan Ogundele*¹, Tarebi Nanakumo¹, Azeez Ishola¹

¹Afe Babalola University

**1-C-76 Patterns of APP fragments suggest that Alzheimer
disease is the end-point of distinct processes in men and women**

*Paul Pennington*¹, Jennifer Nyarko¹, Darrell Mousseau¹

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**1-C-77 Distribution of Somatostatin and Somatostatin
Receptors in Human brain microvascular endothelial cell in
β-amyloid induced Toxicity**

*Seungil Paik*¹, Rishi Somvanshi¹, Ujendra Kumar¹

¹UBC Pharmaceutical Sciences

**1-C-78 Role of Thioresoxin Reductase in regulation of auto-
phagic cell death in Neurons.**

*Nagakannan Pandian*¹, Eftekhara Eftekharpour¹

¹University of Manitoba

**1-C-79 Eye movements reveal sexually dimorphic deficits in
children with fetal alcohol spectrum disorder**

*Angelina Paolozza*¹, Rebecca Munn¹, Douglas Munoz¹, James
Reynolds¹

¹Queen's University

**1-C-80 Expression of a novel delta-opioid receptor isoform in
human brain and a neuroblastoma cell line**

*Marjo Piltanen*¹, Anne-Julie Chabot-Doré¹, Marc Parisien¹, Luda
Diatchenko¹

¹McGill University

**1-C-81 The effect of ASD-associated mutations on neuronal
development**

*Kathryn Post*¹, Kurt Haas¹

¹University of British Columbia

**1-C-82 DIFFERENTIAL EXPRESSION OF CONNEXINS IN A MOUSE
MODEL OF FETAL ALCOHOL SYNDROME**

*Meera Ramani*¹, Meera Ramani¹, Shanthini Mylvaganam¹, Michal
Krawczyk², James Brien³, James Reynolds³, Bhushan Kapur⁴, Michael
Poulter⁵, Georg Zoidl⁶, Peter Carlen¹

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University

**1-C-83 Delayed inhibition of VEGF signaling after stroke
attenuates blood brain barrier breakdown and improves
functional recovery in a co-morbidity dependent manner**

*Patrick Reeson*¹, Kelly Tennant¹, Kim Gerrow¹, Sammy Novak¹, Patrick
Nahirney¹, Craig Brown¹

¹University of Victoria

**1-C-84 Leucine-rich repeat kinase 2 knockout prevents
behavioral deficits and promotes survival in Parkinson's disease
model**

*Christopher Rudyk*¹, Darcy Litteljohn¹, Zach Dwyer¹, Shawn Hayley¹

¹Carleton University

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1-C-85 Investigation of Pannexin 1 in the response of developing neurons to stroke

Juan Sánchez-Arias¹, Leigh Wicki-Stordeur¹, Esther Carmona-Wagner¹, Jagroop Dhaliwal², Adrianna Gunton¹, Michelle Kim¹, Andrew Boyce¹, Valery Shestopalov³, Diane Lagace², Leigh Swayne¹

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1-C-86 Generation of a novel mouse model of the neuronal isoform Kif1a/25b to study hereditary sensory & autonomic neuropathy type II

Jean-Francois Schmouth¹, Daniel Rochefort¹, Pascale Hince¹, Jeffrey Mogil¹, Patrick Dion¹, Guy Rouleau¹

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1-C-87 Concurrent assessment of forelimb function and mesoscopic cortical networks in mouse stroke models

Gergely Silasi¹, Matthieu Vanni¹, Federico Bolanos¹, Jamie Boyd¹, Stephen Scott², Timothy Murphy¹

¹UBC, ²Queen's University

1-C-88 Transcription regulation of the human USP25 gene

Beibei Song¹, Odysseus Zis¹, Fang Cai¹, Weihong Song¹

¹UBC

1-C-89 VEGF protects against blood brain barrier disruption, dendritic spine loss and spatial memory impairment in an experimental model of diabetes

Stephanie Taylor¹, Dustin Trudeau¹, Brendan Arnold¹, Joshua Wang¹, Kim Gerrow¹, Kieran Summerfeldt¹, Andrew Holmes¹, Akram Zamini¹, Patricia Brocardo¹

¹University of Victoria

1-C-90 Transcriptomic approach to cellular composition changes in psychiatric disorders

Lilah Toker¹, Ogan Mancarci¹, Shreejoy Tripathy¹, Paul Pavlidis¹

¹University of British Columbia

1-C-91 Effect of chronic minocycline treatment on restoring dendritic atrophy in a Murine Fragile X Model

Aaron Truesdell¹, Christine Chiu¹, Jason Chiu¹, Mariana Vettrici¹, Suk-yu Yau¹, Brian Christie¹

¹University of Victoria

1-C-92 Amyloid- β oligomers induce autophagy and inhibit axonal transport of autophagosomes in cultured hippocampal neurons

Kresimir Ukalovic¹, Michael Silverman¹

¹Simon Fraser University

1-C-93 The Unfolded Protein Response and cholesterol biosynthesis link Luman/CREB3 to regenerative axon growth in sensory neurons

Zhengxin Ying¹, Vikram Misra¹, Valerie Verge¹

¹University of Saskatchewan

1-C-94 Altered precision of Purkinje cell firing in a mouse model of spinocerebellar ataxia type 6

Sriram Jayabal¹, Lovisa Ljungberg¹, Alanna Watt¹

¹McGill University

1-C-95 Development of a primate model of Alzheimer's Disease II: Characterization of behavioural phenotype

Robert Wither¹, Susan Boehnke¹, Ann Lablans¹, Rob Marino¹, Brian Coe¹, Fernanda De Felice², Douglas Munoz¹

¹Queen's University, ²Federal university of Rio de Janeiro

1-C-96 Adaptation of a naturalistic motor learning task to assess behaviour and drug interventions in the YAC128 model of Huntington's disease

Cameron Woodard¹, Federico Bolaños¹, Tim Murphy¹, Lynn Raymond¹

¹University of British Columbia

1-C-97 Effects of exercise on the basal ganglia morphology in schizophrenia.

Melissa Woodward¹, Donna Lang¹

¹University of British Columbia

1-C-98 Synaptic dysfunction by an Alzheimer-associated mutation A713T in the APP gene

Qin Xu¹, Weihong Song¹

¹University of British Columbia

1-C-99 Using induced pluripotent stem cell-derived neurons to uncover effects of autism-linked mutations on neuronal function.

Kirill Zaslavsky¹, Wenbo Zhang², Eric Deneault², Tadeo Thompson², Alina Piekna², Peter Joel Ross², Asli Dedeagac², Wei Wei², Peter Pascheri², Michael Salter², Stephen Scherer², James Ellis²

¹University of Toronto, ²Hospital for Sick Children

1-C-100 Electrophysiological investigation in neurons derived from human induced pluripotent stem cells with deletions of PTCHD1 locus

Wenbo Zhang¹, P. Joel Ross¹, Kirill Zaslavsky¹, Wei Wei¹, Alina Piekna¹, Tadeo Thompson¹, Stephen Scherer¹, James Ellis¹, Michael Salter¹

¹The Hospital for Sick Children

D - Sensory and Motor Systems

1-D-101 Time course 'dose' of cross-education of strength after handgrip training

Trevor Barss¹, Taryn Klarner¹, Yao Sun¹, E Paul Zehr¹

¹University of Victoria

1-D-102 Repetitive transcranial direct current stimulation (tDCS) of the primary visual cortex induces long-lasting enhancement of contrast perception

Stephan Brandt¹, Janina Behrends¹, Antje Kraft¹, Manuel Olma¹

¹Charité University Hospital

1-D-103 Cell-type specific reorganization of inhibitory circuits during motor learning

Simon Chen¹

¹University of California, San Diego

1-D-104 Cortical substrates for allocentric vs. egocentric representation of remembered saccade targets in the human

Ying Chen¹, John Crawford¹

¹York University

1-D-105 Wii Balance Board and electromyography to assess postural adjustment after perturbation

Yao Sun¹, Hilary Cullen¹, Brian Christie¹, E.Paul Zehr¹

¹University of Victoria

1-D-106 More than a feeling: Passive somatosensory priming facilitates processing of graspable objects

Chelsea Ekstrand¹, Eric Lorentz¹, Layla Gould¹, Marla Mickleborough¹, Ron Borowsky¹

¹University of Saskatchewan

1-D-107 Potentiation of phase II formalin responses in zinc transporter-3 (ZnT-3) knockout mice

Churmy Fan¹, Brendan McAllister¹, Richard Dyck¹, Tuan Trang¹

¹University of Calgary

1-D-108 Central and peripheral afferent processing of natural and artificial vestibular inputs

Patrick Forbes¹, Gunter Siegmund², Alfred Schouten³, Jean-Sébastien Blouin⁴

¹University of British Columbia/Delft University of Technology, ²MEA Forensic Engineers & Scientists, ³Delft University of Technology, ⁴University of British Columbia

1-D-109 CD11b+Ly6G- myeloid cells drive mechanical inflammatory pain hypersensitivity

Nader Ghasemlou¹, Nader Ghasemlou¹, Isaac Chiu², Sun Wook Hwang³, Jean-Pierre Julien⁴, Clifford Woolf³

¹Queen's University, ²Harvard Medical School, ³Boston Children's Hospital, ⁴Université Laval

1-D-110 Cholinergic receptors expression in the visual cortex following long-term enhancement of visual cortical activity by cholinergic stimulation

Marianne Groleau¹, Mira Chamoun¹, Menakshi Bhat¹, Frédéric Huppé-Gourgues¹, Réjean Couture¹, Elvire Vaucher¹

¹Université de Montréal

1-D-111 A computational approach to decipher the network topology of the dorsal root ganglion

Nicolas Doyon¹, Simon Hardy¹, Patrick Desrosiers¹, Yves De Koninck¹

¹Université Laval

1-D-112 Primary motor cortical neurons reflect vector sum of ipsilateral and contralateral feedback modulation

Ethan Heming¹, Stephen Scott¹

¹Queen's University

1-D-113 Prediction of future sensory states requires self-generated motor commands

Robert Hermosillo¹, Paul van Donkelaar¹

¹University of British Columbia

1-D-114 Multisensory integration in human pupil orienting response

Jeff Huang¹, Chin-An Wang¹, Douglas Munoz¹

¹Queen's University

1-D-115 Reversible inactivation mapping of cortical sites required for voluntary forelimb movements in VGAT-ChR2 transgenic mice.

Raghu Ram Katreddi¹, Greg Silasi¹, Jamie Boyd¹, Jeff LeDue¹, Stephen Scott², Timothy Murphy¹

¹University of British Columbia, ²Queen's University

1-D-116 From chaos to control: Using oscillations to harness neuronal networks

Eric Kuebler¹, Jean-Philippe Thivierge¹

¹University of Ottawa

1-D-117 A Computational Model of Updating and Integration of Remembered Visual Stimuli across Eye Movements

Yalda Mohsenzadeh¹, Douglas Crawford¹

¹York University

1-D-118 Phosphatase 2B mediates NMDAR plasticity and metaplasticity in early odor preference learning in rats

Bandhan Mukherjee¹, Bandhan Mukherjee², Qi Yuan²

¹Memorial University, ²Memorial University of Newfoundland

1-D-119 Lack of adenylyl cyclase 1 (AC1) affect corticospinal tract development and locomotor recovery after spinal cord injury

Hanane Nait Taleb Ali¹, Hanane Nait Taleb Ali², Pierre marie Morel³, Sophie Scotto-Lomassese⁴, patricia Gaspar⁵, Isabelle Dusart⁶, Mohamed bennis⁷

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1-D-120 Spatiotemporal profiles of receptive fields of area 21a neurons in the cat

Bruno Oliveira Ferreira de Souza¹, Christian Casanova¹

¹Université de Montréal

1-D-121 Precise coding of ankle rotation by lower-limb muscle spindle afferents

Ryan Peters¹, Brian Dalton², Jean-Sébastien Blouin¹, Tim Inglis¹

¹University of British Columbia, ²University of Oregon

1-D-122 Dopamine exerts concentration-dependent bidirectional modulation and evokes state-dependent rhythmicity in motor networks of the neonatal mouse spinal cord

Simon Sharples¹, Patrick Whelan²

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

1-D-123 Plasticity of Binocularity and Visual Acuity are Differentially Limited by Nogo Receptor

Céleste-Élise Stephany¹, Leanne Chan², Sherveen Parivash¹, Hilary Dorton¹, Mariel Piechowicz³, ShenFeng Qiu³, Aaron McGee¹

¹The Saban Research Institute, Children's Hospital Los Angeles, ²Centre for Biosystems, Neuroscience, and Nanotechnology, City University of Hong Kong, ³University of Arizona, College of Medicine

1-D-124 Wide field calcium imaging of resting state activity in mice reveals both motif level, as well larger sensory clusters

Mathieu Vanni¹, Allen Chan¹, Dongsheng Xiao¹, Gergely Silasi¹, Jeffrey Ledue¹, Mostafa Moshevand¹, Tim Murphy¹

¹University of British Columbia

1-D-125 Decoding the encoding strategy of primary sensory neurons by in vivo calcium imaging

Feng Wang¹, Erik Bélanger¹, Sylvain Côté¹, Daniel Côté¹, Yves De Koninck¹

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1-D-126 Unbiased estimate of the spinal cord neuronal population involved in non-human primate motor control
Nolan Wilson¹, Stephen Scott¹

¹Queen's University

1-D-127 Dissociation of parietal cortex contributions to obstacle memory in walking cats

Carmen Wong¹, Keir Pearson², Stephen Lomber¹

¹The University of Western Ontario, ²University of Alberta

1-D-128 Imbalance of Excitation and Inhibition at Threshold Level In the Auditory Cortex

Yan Zhao², Zizhen Zhang¹, Xiuping Liu¹, Colin Xiong¹, Jun Yan¹

¹University of Calgary, ²Southern Medical University

E - Homeostatic and Neuroendocrine Systems

1-E-129 Effects of ANA-12, a selective tyrosine-related kinase B (TrkB) antagonist, on anxiety, exploration, locomotion and fear avoidance learning following a repeated stress regimen in male Wistar rats

Idu Azogu¹, Helene Plamondon¹

¹University of Ottawa

1-E-130 Dopamine acts directly on arcuate nucleus neurons to alter expression of neuropeptide genes

Samantha Lee¹, Lauren Shute¹, Mark Fry¹

¹University of Manitoba

1-E-131 Intra-VTA insulin decreases nucleus accumbens dopamine release in vivo

Lindsay Naef¹, Jeff Huang², Calvin Lee², Dmitry Mebel², Stephanie Borgland¹

¹University of Calgary, ²University of British Columbia

1-E-132 Alteration to one carbon metabolism may underlie glutathione deficiencies in the rat dentate gyrus after prenatal ethanol exposure

Scott Sawchuk¹, Anna Patten¹, Brian Christie¹

¹University of Victoria

1-E-133 4(5)-methylimidazole, found in caramel colouring, alters gene expression in arcuate nucleus neurons.

Lauren Shute¹, Samantha Lee¹, Geemitha Ratnayake², Thor Halldorson¹, Lianna Bestvater¹, Gregg Tomy¹, Mark Fry¹

¹University of Manitoba, ²Acadia Junior High School

F - Cognition and Behavior

1-F-134 Circuit principles of neuronal processing in larval *Drosophila melanogaster* thermotaxis

Bruno Afonso¹, Mason Klein², Matthew Berck², Ivan Ilarderet³, Marc Gershow⁴, James Truman⁵, Simon Sprecher³, Albert Cardona⁵, Aravi Samuel², Marta Zlatić⁵

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³University of Fribourg, ⁴New York University, ⁵HHMI Janelia Research Center

1-F-135 Cognitive impairments in a touchscreen-based visual discrimination and reversal learning procedure in a rat model of absence epilepsy

Lei An¹, Wendie Marks¹, Stuart Cain², Terrance Snutch², John Howland¹

¹University of Saskatchewan, ²University of British Columbia

1-F-136 Training experience affects the selectivity of neurons and the pattern of noise correlations in primate lateral prefrontal cortex

Theda Backen¹, Stefan Treue², Julio Martinez-Trujillo³

¹McGill University, ²German Primate Center, ³University of Western Ontario

1-F-137 Pattern separation deficits in a patient with bilateral dentate gyrus lesions

Stevenson Baker¹, R. Shayna Rosenbaum¹

¹York University

1-F-138 Simulation of embodied and the large-scale neuronal systems with the iqr software

Ulysses Bernardet¹

¹Simon Fraser University

1-F-139 The Word on the Beat: Behaviour and Brain Interactions of Reading and Rhythm

Layla Gould¹, Eric Lorentz¹, Chelsea Ekstrand¹, Tessa McKibben¹, Marla Mickleborough¹, Ron Borowsky¹

¹University of Saskatchewan

1-F-140 The effect of fendiline on cocaine self-administration and reinstatement of cocaine-seeking behaviour in the rat.

Erin Orr², Jonathan Cunningham³, Barbara Lothian², Jennifer Morgen², Karen Brebner²

¹St Francis Xavier University, ²St. Francis Xavier University, ³University of British Columbia

1-F-141 Younger age of onset of cannabis use is associated with thalamic dysconnectivity in youth at clinical high risk of psychosis

Lisa Buchy¹, Tyrone Cannon², Alan Anticevic², Kristina Lyngberg¹, Kristin Cadenhead³, Barbara Cornblatt⁴, Thomas McGlashan², Diana Perkins⁵, Larry Seidman⁶, Ming Tsuang³, Elaine Walker⁷, Scott Woods², Carrie Bearden⁸, Daniel Mathalon⁹

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⁵University of North Carolina, ⁶Harvard Medical School at Beth Israel Deaconess Medical Center and Massachusetts General Hospital, ⁷Emory University, ⁸UCLA, ⁹UCSF

1-F-142 A novel Presenilin 1 mutation causes Alzheimer's Disease

Fang Cai¹, Shuting Zhang¹, Weihong Song¹

¹UBC

1-F-143 Effect of T-type calcium channel blockade on the induction and reinstatement of morphine-induced conditioned place preference

Jonathan Cunningham¹, Carine Dias¹, Terry Snutch¹, Anthony Phillips¹

¹University of British Columbia

1-F-144 Knowledge of haptic feedback availability does not influence size information supporting pantomime grasping
Shirin Davarpanah Jazi¹, Stephanie Hosang¹, Matthew Heath¹

¹University of Western Ontario

1-F-145 Functional interaction between medial prefrontal cortex and dorsomedial striatum is necessary for odour memory span in rats: role of GluN2B-containing NMDA receptors
Don Davies¹, Quentin Greba¹, Jantz Selk¹, Jillian Catton¹, John Howland¹

¹University of Saskatchewan

1-F-146 Moxifloxacin Induced Psychosis: A Case Report Study
Arman Fesharaki¹

¹SUNY Downstate Medical Center

1-F-147 Approach and Avoidance Processing: Investigating a Rostrocaudal Gradient in the Nucleus Accumbens Core
Laurie Hamel¹, Anett Schumacher¹, Rutsuko Ito¹

¹University of Toronto

1-F-148 Impoverished Descriptions of Familiar Routes in Three Cases of Medial Temporal Lobe/Hippocampal Amnesia
Katherine Herdman¹, Navona Calarco¹, Morris Moscovitch², Marnie Hirshhorn³, R Shayna Rosenbaum⁴

¹York University, ²University of Toronto; Baycrest, ³University of Toronto, ⁴York University; Baycrest

1-F-149 Decoding Phenomenal Experience in Vegetative State Patients
Austin Horn¹, Lorina Naci¹, Charles Weijer¹, Adrian Owen¹

¹Western University

1-F-150 Does place field repetition impair spatial learning?
Bryan Jenkins¹, Roddy Grieves¹, Bryan Jenkins¹, Emma Wood¹, Paul Dudchenko²

¹University of Edinburgh, ²University of Stirling

1-F-151 Differential Effects of Dopamine and Selective Dopamine Agonists on Spatial Working Memory, Attention, Learning and Reaction Time in Healthy Controls
Robert Marino¹, Alenka Bullen¹, Ron Levy¹

¹Queen's University

1-F-152 Increased spontaneous somatic-patterned cortical activity in a mouse model of depression
Alexander McGirr¹, Allen Chan¹, Yicheng Xie¹, Jeffrey LeDue¹, Diana Lim¹, Pumin Wang¹, Timothy Murphy¹

¹University of British Columbia

1-F-153 Cadherin adhesion complexes and cocaine-mediated synaptic plasticity
Andrea Globa¹, Fergil Mills¹, Catherine Cowan¹, Shuai Liu², Stephanie Borgland¹, Anthony Phillips¹, Shernaz Bamji¹

¹University of British Columbia, ²University of Calgary

1-F-154 Synaptic Plasticity and Reversal Learning are Impaired following B-catenin Stabilization in Hippocampal Neurons
Fergil Mills¹, Thomas Bartlett¹, Lasse Dissing-Olesen¹, Marta Wisniewska¹, Jacek Kuznicki¹, Brian Macvicar¹, Yu Tian Wang¹, Shernaz Bamji¹

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1-F-155 Disrupted docosahexaenoic acid metabolism in carriers of apolipoprotein E epsilon 4 allele: is there a link with the risk of developing cognitive decline?
Melanie Plourde¹

¹Université de Sherbrooke

1-F-156 Suppression of simple visual hallucinations from occipital stroke using TMS
Sara Rafique¹, John Richards², Jennifer Steeves¹

¹York University, ²University of California, Davis, Medical Center

1-F-157 Navigational strategies in young and older adult Inuit hunters
Devin Sodums¹

¹McGill University

1-F-158 Different measures of decisions yield distinct information: Explicit and implicit measures reveal independent biases during economic decision making in a reaching task
Nathan Wispinski¹, Christopher Madan², Craig Chapman³

¹University of British Columbia, ²Boston College, ³University of Alberta

1-F-159 The role of parvalbumin-positive interneurons in memory consolidation
Frances Xia¹, Blake Richards², Sheena Josselyn¹, Kaori Takehara-Nishiuchi², Paul Frankland¹

¹Hospital for Sick Children, ²University of Toronto

1-F-160 Prenatal Marginal Vitamin A Deficiency Facilitates Alzheimer's Disease Pathogenesis
Jiaying Zeng¹, Qian Chen¹, Zhen Fan¹, Li Chen¹, Tingyu Li¹, Weihong Song²

¹University of British Columbia, ²Children's Hospital of Chongqing Medical University

G - Novel Methods and Technology Development

1-G-161 Expanding the toolbox of genetically encoded voltage indicators
Ahmed Abdelfattah¹, Samouil Farhi², Yongxin Zhao¹, Daan Brinks², Peng Zou², Araya Ruangkittisakul¹, Klaus Ballanyi¹, Adam Cohen², Robert Campbell¹

¹University of Alberta, ²Harvard University

1-G-162 RNA-Lipid Nanoparticles: A Robust and Potent Tool for Gene Knockdown and Expression in Primary Neurons
Aysha Ansari¹, David Zwaenepoel¹, Adam White², Colin Walsh¹, Anitha Thomas¹, Timothy Leaver¹, Andre Wild¹, Yuping Li², Yu Tian Wang², James Taylor¹, Euan Ramsay¹, Carl Hansen², Pieter Cullis²

¹Precision NanoSystems Inc., ²University of British Columbia

1-G-163 Epidural fiber optic implant for spinal optogenetics in freely behaving animals
Robert Bonin¹, Feng Wang¹, Mireille Desrochers-Couture¹, Yves De Koninck¹

¹Institut universitaire en santé mentale de Québec

1-G-164 Optical Guidance for Deep Brain Stimulation Electrode Placement in the Treatment of Parkinson's Disease
DePaoli Damon¹, Laurent Goetz¹, Martin Parent¹, Leo Cantin¹, Michel Prudhomme¹, Tigran Galstian¹, Younnes Messaddeq¹, Daniel Côté¹

¹University of Laval

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1-G-165 Modeling by finite element method of ion concentration fluctuations in dendritic spines and the extracellular space
*Ibrahima Dione*¹, Nicolas Doyon¹, Yves De Koninck¹

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1-G-166 Label-free microscopy to infer nerve fibers morphology and myelination in structurally complex samples

*Alicja Gasecka*¹, Steve Begin¹, Daniel Cote¹

¹Quebec Mental Health Institute Research Centre

1-G-167 AAV-compatible MiniPromoters Target Specific Cell Types of the Central Nervous System

*Andrea Korecki*¹, Charles de Leeuw¹, Siu Ling Lam¹, Garrett Berry², Jack Hickmott¹, Tess Lengyell¹, Russell Bonaguro¹, Lisa Borretta¹, Alice Chou¹, Olga Kaspieva¹, Stephanie Laprise¹, Simone McInerney¹, Elodie Portales-Casamar¹, Magdalena Swanson-Newman¹,

¹University of British Columbia, ²University of North Carolina, ³Simon Fraser University

1-G-168 Hyperspectral imaging to track simultaneously the spatial dynamics of multiple subtypes of individual proteins on live neurons

*Simon Labrecque*¹, Jean-Philippe Sylvestre², Stéphane Marcet², Francesca Mangiarini², Marc Verhaegen², Sébastien Blais-Ouellette³, Paul De Koninck¹

¹Université Laval, ²Photon Etc., ³Photon Etc

1-G-169 Development of a novel tissue engineered model of the cerebrovasculature

*Jerome Robert*¹, Sophie Stukas¹, Cheryl Wellington¹

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1-G-170 Two-photon optogenetics with near-infrared light-activated cyclases for studying the role of cAMP and cGMP in living neurons

*Megan Valencia*¹, Thomas Luyben¹, Kenichi Okamoto¹

¹University of Toronto

1-G-171 Point source networks: correlation between local firing properties and regional cortical imaging in mouse cortex

*Dongsheng Xiao*¹, Matthieu Vanni¹, Allen Chan¹, Timothy Murphy¹

¹Brain Research Centre, The University of British Columbia

1-G-172 High yield and purity of primary astrocyte and microglia cultures from embryonic mouse and rat cerebral cortex

*Adam Yu*¹, Sarah Neil¹, Jacqueline Quandt¹

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IBRO – International Brain Research Organisation

1-IBRO-173 Peer rescue of autism-related behavior after prenatal exposure to valproic acid

*Marcos Campolongo*¹, Nadia Kazlauskas¹, Amaicha Depino¹

¹Institute of Physiology, Molecular Biology and Neuroscience (IFIBYNE)

1-IBRO-174 Proteolytic processing of CXCL12 transforms CXCL12 into a death factor for neural stem cells

*Tais Adelita*¹, Roberta Stilhano¹, San Han¹, Giselle Justo¹, Marimelia Porcionatto¹

¹UNIFESP

1-IBRO-175 Acute stress increases FMRP levels in hippocampus and promotes Akt-mTOR and MAPK1/2 pathways activation in rats

*Felipe Aguayo*¹, Paulina Rojas², Aníbal Pacheco¹, Gonzalo Gracia-Rojo¹, Mauricio Muñoz-Llanos¹, Alexandra García-Pérez¹, Ruth Márquez¹, Jenny Fiedler¹

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1-IBRO-176 Cognitive studies and a direct cell reprogramming protocol for the aging rat brain

*Micaela López-León*¹, Gustavo Morel¹, Maia Uriarte¹, Marianne Lehmann¹, Rodolfo Goya¹

¹National University of La Plata

1-IBRO-177 Relative Expression of Odorant Binding Proteins in the Forest Tsetse fly Species *Glossina brevipalpis*

*Mary Murithi*¹, Rosaline Macharia², Esther Magiri¹, Steven Nyanjom¹, Daniel Masiga²

¹Jomo Kenyatta University of Agriculture and Technology, ²International Center Of Insect Physiology and Ecology

1-IBRO-178 Impaired autophagy associated with glucose deprivation induces neuronal death through subsequent autophagy activation.

*Cristian Geronimo-Olvera*¹, Teresa Montiel¹, Lourdes Massieu¹

¹Universidad Nacional Autónoma de México

1-IBRO-179 Evidence for a decrease of pyramidal cells dendrites in neonatal thalamic lesioned rat's prefrontal cortex: implication in Schizophrenia

*Zakaria Ouhaz*¹, Saadia Ba-M'Hamed¹, Mohamed Bennis¹

¹Université Cadi Ayyad, Faculté des Sciences Semlalia

1-IBRO-180 Role of IL-10 in macrophage polarization and recovery after peripheral nerve injury

*Bruno Mietto*¹, Antje Kroner², Elizabeth Girolami², Ji Zhang³, Samuel David²

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A – Development

2-A-1 TALEN- and CRISPR/Cas9-mediated disruption of the robo3 gene in *Xenopus tropicalis*

*Anteneh Argaw*¹, Dietmar Schmucker¹

¹VIB

2-A-2 Survival and maturation of the developmentally-born cell population in the rat dentate gyrus.

*Shaina Cahill*¹, Ru Qi Yu¹, Dylan Green¹, Jason Snyder¹

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2-A-3 Role of Cux factors in cerebellar development

*Emily Capaldo*¹, Angelo Iulianella¹

¹Dalhousie University

2-A-4 Prenatal Alcohol Exposure Alters Expression of Glucocorticoid and Mineralocorticoid Receptor Levels in the Placenta and Fetal Brain at Gestational Day 21

*Melissa Chiu*¹, Ni Lan¹, Joanne Weinberg¹

¹University of British Columbia

2-A-5 Inflammation dysregulates neural circuit formation in vivo via microglial activation and IL-1 β

*Nasr Farooqi*¹, Edward Ruthazer¹

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2-A-6 The requirement for the Rb Family during Adult Neurogenesis

*Bensun Fong*¹, Renaud Vandenbosch², Devon Svoboda¹, Alysén Clark¹, David Park¹, Ruth Slack¹

¹University of Ottawa, ²University of Liege

2-A-7 Examining the Role of DIXDC1 in Neural Connectivity and Autism Spectrum Disorders

Vickie Kwan¹, Susan Walker², Stephen Scherer², Karun Singh¹

¹McMaster University, ²The Hospital for Sick Children

2-A-8 Inter-neuronal interaction defines topographic synaptic innervation in *C. elegans*

*Kota Mizumoto*¹

¹University of British Columbia

2-A-9 Regulation of synaptic connectivity by a novel FMR1-TA02 pathway and its disruption in autism spectrum disorders.

*Nadeem Murtaza*¹, Melanie Richter², Pritha Paul¹, Vickie Kwan¹, Emanuela Pasciuto³, Susan Walker⁴, Stephen Scherer⁴, Claudia Bagni³, Froylan Calderon de Anda², Karun Singh¹

¹McMaster University/Stem Cell and Cancer Research Center, ²University of Hamburg/Center for Molecular Neurobiology Hamburg, ³University of Leuven/Flanders Institute for Biotechnology, ⁴University of Toronto/Hospital for Sick Children

2-A-10 A FASD Mouse Model: Biochemically Mimicking Alcohol Exposure using Gsc promoter driven Cyp26A1 cDNA.

*Berardino Petrelli*¹, Arzu Ozturk¹, Molly Pind¹, Abraham Fainsod¹, Geoff Hicks¹

¹University of Manitoba

2-A-11 Collaborative regulation of Prostaglandin E2 and Wnt signalling pathways in neuroectodermal stem cells: implication in autism

*Christine Wong*¹, Eizaaz Ahmad¹, Hongyan Li¹, Dorota Crawford¹

¹York University

2-A-12 The ASD-associated gene Glyoxalase1 integrates the fetal-maternal metabolism of the diabetes risk factor methylglyoxal to regulate embryonic neurogenesis

*Guang Yang*¹, Freda Miller¹, David Kaplan¹

¹The Hospital for Sick Children

2-A-174 Effects of prenatal alcohol exposure and early life stress on the immune response to challenge: Profiling cytokine expression patterns in multiple compartments

*David Mak*¹, Tamara Bodnar¹, Joanne Weinberg¹

¹The University of British Columbia

B - Neural Excitability, Synapses, and Glia: Cellular Mechanisms

2-B-13 Modulation of synaptic fidelity by post-synaptic Pannexin-1

*Jennifer Bialecki*¹, Nicholas Weilingner¹, Matthew Hill¹, Roger Thompson¹

¹Hotchkiss Brain Institute

2-B-14 Two-photon FRET and optogenetics for studying post-synaptic cGMP during plasticity

*Jelena Borovac*¹, Tyler Luyben¹, Kenichi Okamoto¹

¹University of Toronto

2-B-15 ATP-evoked internalization of Pannexin 1 channels

*Andrew Boyce*¹, Ross Prager¹, Leigh Wicki-Stordeur¹, Michelle Kim¹, Leigh Anne Swayne¹

¹University of Victoria

2-B-16 Nemo kinase is a transcriptional target of the BMP signaling cascade in motoneurons

*Mario Calderon*¹, Kimberly Young¹, Edward Liao¹, Pejmun Haghighi¹

¹McGill University

2-B-17 Distinct functional roles for P/Q- and N-types voltage-gated calcium channels in neurotransmitter release at mossy fiber to CA3 pyramidal cell synapses

*Simon Chamberland*¹, Alesya Evstratova¹, Katalin Tóth¹

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2-B-18 Pathway specific depolarization-induced suppression of inhibition in hypothalamic parvocellular neuroendocrine neurons

*Phillip Colmers*¹, Jaideep Bains¹

¹University of Calgary

2-B-19 Absence of MDGA1 Enhances Inhibitory Drive and Confers Resistance to Increased Excitation in Mouse Hippocampus

*Steven Connor*¹, Ina Ammendrup-Johnsen¹, Parisa Karimi Tari¹, Tohru Yamamoto², Yu Tian Wang¹, Ann Marie Craig¹

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2-B-20 Investigating the regulation and function of mitochondrial remodelling in rat cortical astrocytes

*Samineh Deheshi*¹, Susu Fan¹, Bahram Dabiri¹, Michelle Tsang¹, Sarah Warda¹, Leili Atashkari¹, Yana Saranchova¹, Gordon Rintoul¹

¹Simon Fraser University

2-B-21 Inducible Deletion of Myelin Regulatory Factor is a Cell Selective Mechanism to Impair Oligodendrocyte Remyelination

*Greg Duncan*¹, Jason Plemel², Jie Liu¹, Ryan Hirata¹, Yasmin Chaeichi¹, Matan Berson¹, Wolfram Tetzlaff¹

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2-B-22 Reduced Hyperpolarization-Activated Current Contributes to an Enhanced Intrinsic Excitability in Hippocampal Neurons from PrP^{-/-} Mice

*Jing Fan*¹, Patrick Stemkowski¹, Stefanie Black¹, Ivana Souza¹, Gerald Zamponi¹

¹University of Calgary

2-B-23 Kainate receptor mediated regulation of chloride homeostasis

*Danielle Garand*¹, Vivek Mahadevan¹, Melanie Woodin¹

¹University of Toronto

2-B-24 Selective viral manipulation of neostriatal matrix compartment

*Mariela Garcia-Munoz*¹, Violeta Lopez-Huerta¹, Yoko Nakano¹, Michael Lazarus², Gordon Arbuthnott¹

¹Okinawa Institute of Science and Technology Graduate University,

²University of Tsukuba

2-B-25 Modulation of GABAA receptors by a novel associated protein

*Yuan Ge*¹, Yunhee Kang¹, Leonard Foster¹, Ann Marie Craig¹

¹University of British Columbia

2-B-26 Age-Dependent Odor Preference: Neuronal Properties and Responsiveness to Norepinephrine in the Anterior Piriform Cortex of the mouse

*Abhinaba Ghosh*¹, Nicole Purchase¹, Xihua Chen¹, Qi Yuan¹

¹Memorial University Of Newfoundland

2-B-27 Semaphorin 5A in Synapse Pruning and Autism Spectrum Disorders

*Rachel Gomm Kolisko*¹, Wei Xiao¹, Riki Dingwall¹, D. Blair Jovellar¹, Shernaz Bamji¹, Timothy O'Connor¹

¹University of British Columbia

2-B-28 Regulation of the transient receptor potential vanilloid 1 (TRPV1) channel by heat shock protein 70 (HSC70)

*Mircea Iftinca*¹, Robyn Flynn¹, Christophe Altier¹

¹University of Calgary

2-B-29 Nitric oxide modulation of phosphodiesterase activity and cAMP levels in astrocytes

*Rebecca Ko*¹, Hyun Choi¹, Brian MacVicar¹

¹University of British Columbia

2-B-30 Synaptic mechanisms gating the cortico-hippocampal information flow through activation of the CA1 disinhibitory circuit

*Xiao Luo*¹, Lisa Topolnik¹

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2-B-31 Protein Tyrosine Phosphatase Alpha-mediated Akt activation is required for oligodendrocyte differentiation and myelination

*Philip Ly*¹, Yuda Shih¹, Jing Wang¹, Catherine Pallen¹

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2-B-32 T-type-mediated calcium spikes in dendrites of CA3 pyramidal neurons couple to Kv4 channels and mGluR1 receptors

*Aqsa Malik*¹, Brian MacVicar¹

¹University of British Columbia

2-B-33 Activity Dependent Changes to Resting Astrocyte Ca²⁺+

*Eslam Mehina*¹, Grant Gordon¹

¹University of Calgary

2-B-34 Ultrastructural analysis of blood-brain barrier breakdown in the peri-infarct zone of young adult and aged mice

*Patrick Nahirney*¹, Patrick Reeson¹, Craig Brown¹

¹University of Victoria

2-B-35 Sensory-evoked dendritic activity and somatic firing instruct morphogenesis in the awake brain

*Kaspar Podgorski*¹, Serhiy Opushnyev¹, Kurt Haas¹

¹University of British Columbia

2-B-36 Thalamic modulation of the cortical slow oscillation

*Anastasiia Ozur*¹, Sylvain Chauvette¹, Igor Timofeev¹

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2-B-37 Optogenetic quantification of glutamate clearance following synaptic release in health and disease

*Matthew Parsons*¹, Matthieu Vanni¹, Timothy Murphy¹, Lynn Raymond¹

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2-B-38 Synaptic Plasticity in the Globus Pallidus

*Ian Prescott*¹, Rob Marino¹, Ron Levy¹

¹Queen's University

2-B-39 All-or-none axonal Ca²⁺ dynamics in recurrent circuits of the hippocampus

*Israeli Ran*¹, Richard Tsien¹

¹NYU Neuroscience Institute

2-B-40 The cellular mechanisms of neuronal swelling underlying cytotoxic edema

*Ravi Rungta*¹, Hyun Choi¹, John Tyson¹, Aqsa Malik¹, Lasse Dissing-Olesen¹, Paulo Lin¹, Stuart Cain¹, Pieter Cullis¹, Terrance Snutch¹, Brian MacVicar¹

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2-B-41 The X-linked Intellectual Disability Gene, DHH9, in Neurite Outgrowth and Synapse Formation

*Jordan Shimell*¹, D. Blair Jovellar¹, G. Stefano Brigidi¹, Shernaz Bamji¹

¹University of British Columbia

2-B-42 Diacylglycerol and inositol triphosphate modulate a protein kinase C-dependent change in Aplysia bag cell neuron excitability

Raymond Sturgeon¹, Neil Magoski¹

¹Queen's University

2-B-43 Paradoxical excitation by primary afferent depolarization requires dual changes in GABAergic signalling and neuronal excitability

Petri Takkala¹, Yi Zhu², Steven Prescott³

¹University of Toronto, ²University of Pittsburgh, ³The Hospital for Sick Children

2-B-44 Modelling morphology and integration in developing dendrites

Lara Thompson¹

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2-B-45 D-Serine influences retinotectal synapse maturation and axonal refinement in the developing visual system

Marion Van Horn¹, Loredano Pollegioni², Edward Ruthazer¹

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2-B-46 Glycine-mediated fast inhibitory synaptic transmission in the hypothalamic paraventricular nucleus

Vojtech Vavra¹

¹University of Calgary

2-B-47 Role of palmitoylation in NMDA receptor trafficking and function in corticostriatal co-culture

Liang Wang¹, Rujun Kang¹, Lynn Raymond¹

¹University of British Columbia

2-B-48 A new signaling modality for NMDA receptors in excitotoxic cell death and ischemic stroke

Nicholas Weillinger¹, Brooke Rakai¹, Alexander Lohman¹, Jennifer Bialecki¹, Nathan Ikuta², Lucas Scott¹, Michael Colicos¹, Campbell Teskey¹, Ian Winship², Roger Thompson¹

¹Hotchkiss Brain Institute, ²Neurochemical Research Unit / University of Alberta

2-B-49 Class 5 semaphorins mediate synaptic elimination and activity-dependent plasticity in rodent hippocampal neurons

Wei Xiao¹, Rachel Gomm Kolisko¹, Riki Dingwall¹, Blair Jovellar¹, Shernaz Bamji¹, Tim O'Connor¹

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2-B-50 Persistent firing and its transition to ictal-like response in hippocampal CA1 pyramidal neurons

Motoharu Yoshida¹, Beate Knauer¹

¹Ruhr University Bochum

2-B-51 Regulation of endosome fusion by Cav2.2

Fangxiong Zhang¹, Gerald Zamponi¹

¹University of Calgary

C - Disorders of the Nervous System

2-C-52 Glutamatergic transmission is enhanced in the amygdala in Experimental Autoimmune Encephalomyelitis

Shaona Acharjee¹, Adrienne Benediktsson², Quentin Pittman¹

¹University of Calgary, ²Mount Royal University

2-C-53 PDGFR α -positive progenitor cells form myelinating oligodendrocytes and Schwann cells following contusion spinal cord injury

Peggy Assinck¹, Greg Duncan², Jason Plemel³, Michael Lee², Jie Liu², Dwight Bergles⁴, Wolfram Tetzlaff²

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2-C-54 Neuronal sodium elevation and COX-2 activation in post-traumatic epileptogenesis in vitro

Trevor Balena¹, Kevin Staley¹

¹Massachusetts General Hospital

2-C-55 Development of a primate model of Alzheimer's Disease I. Characterization of molecular pathology

Susan Boehnke¹, Leticia Forny-Germano², Robert Wither¹, Ann Lablans¹, Brian Coe¹, Fernanda De Felice², Douglas Munoz¹

¹Queen's University, ²Federal University of Rio de Janeiro

2-C-56 Experimental traumatic brain injury: Bad to the bone?

Rhys Brady¹, Sandy Shultz², Mujun Sun², Tania Romano¹, David Wright³, John Wark⁴, Terrence O'Brien¹, Brian Grills¹, Stuart McDonald¹

¹La Trobe University, ²The University of Melbourne, ³Florey Institute of Neuroscience and Mental Health, ⁴Royal Melbourne Hospital

2-C-57 High density lipoproteins benefit function and reduce inflammation in human brain microvascular endothelial cells.

Emily Button¹, Jerome Robert¹, Sophie Stukas¹, Cheryl Wellington¹

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2-C-58 Pregabalin Alters Cortical Spreading Depression and Synaptic Function in a Model of Familial Hemiplegic Migraine Type-1

Stuart Cain¹, Barry Bohnet¹, Andrew Yung¹, Huili Han¹, Piotr Kozlowski¹, Brian MacVicar¹, Terrance Snutch¹

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2-C-59 A mouse model of SNCA multiplication

Stefano Cataldi¹

¹Centre for applied Neurogenetics

2-C-60 A model of epilepsy based on optogenetic kindling

Elvis Cela¹, Andrew Chung¹, Taiji Wang¹, Per Jesper Sjöström²

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2-C-61 Chronic stress induces anxiety via an amygdalar intracellular cascade that impairs endocannabinoid signaling: identification of a common therapeutic target for metabolic and anxiety disorders

Zhaohong Qin¹, Xun Zhou¹, Nihar Pandey¹, Haley Vecchiarelli², Chloe Stewart¹, Xia Zhang³, Diane Lagace⁴, Jean Michel Brunel⁵, Jean-Claude Beique⁶, Alexandre Stewart⁷, Matthew Hill², Hsiao-Huei Chen¹

¹Ottawa Hospital Research Institute/ University of Ottawa, ²University of Calgary, ³Royal Ottawa Mental Health Centre, ⁴University of Ottawa, ⁵Aix-Marseille Université, ⁶University of Ottawa, ⁷University of Ottawa Heart Institute

2-C-62 Neuropathology in APP/PS1 Mice is Exacerbated after CHIMERA (Closed-Head Impact Model of Engineered Rotational Acceleration)-Induced Traumatic Brain Injury

Wai Hang Cheng¹, Dhananjay Namjoshi¹, Kris Martens¹, Anna Wilkinson¹, Taylor Ward-Able¹, Arooj Hayat¹, Kurt McInnes¹, Peter

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Cripton¹, Cheryl Wellington¹

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2-C-63 Chronic Minocycline Treatment Rescues Social Interaction Deficit in Fmr1 KO Mice

Christine Chiu¹, Mariana Vettrici¹, Suk-Yu Yau¹, Brian Christie¹

¹University of Victoria

2-C-64 Stimulatory effects of nACh-R agonist activation on open field locomotor behaviour in a Rett syndrome mouse model.

David McPhee², Tony Renda², Jay Leung², Raad Nashmi², Kerry Delaney²

¹Univ. of Victoria, ²University of Victoria

2-C-65 Extracellular Vesicles from Amyotrophic Lateral Sclerosis Tissue have Misfolded SOD1 Cargo and Are Implicated in Propagation of Protein Misfolding

Sarah Fernando¹, Judith Silverman¹, Leslie Grad¹, Neil Cashman¹

¹University of British Columbia

2-C-66 Neonatal Odor Learning Impairments Following Prenatal Ethanol Exposure

Christine Fontaine¹, James Dunbar¹, Julie Munich¹, Anna Patten¹, Brian Christie¹

¹University of Victoria

2-C-67 CD8+ T cells increase the encephalitogenic potential of CD4+ T cells in a novel mouse model of multiple sclerosis

Preetha Mercy Ignatius Arokia Doss¹, Andree-Pascale Roy¹, Joanie Baillargeon¹, Manu Rangachari¹

¹Centre Hospitalier Université Laval (CHUL), Quebec city

2-C-68 Can five weeks of arm cycling training improve walking and interlimb coordination in chronic stroke?

Chelsea Kaupp¹, Taryn Klarner¹, Natalia Zapotoczny¹, Yao Sun¹, Hilary Cullen¹, Trevor Barss¹, Gregory Pearcey¹, Paul Zehr¹

¹University of Victoria

2-C-69 Seizures during brain circuit formation

Dong Hwan Kim¹, Kurt Haas¹

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2-C-70 Arm and leg cycling training improves neurological function and walking ability after stroke

Taryn Klarner¹, Trevor Barss¹, Yao Sun¹, Chelsea Kaupp¹, Gregory Pearcey¹, Pamela Loadman¹, E Paul Zehr¹

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2-C-71 Burst-Predicting Neurons Survive an in vitro Excitotoxic Injury Model of Cerebral Ischemia

Eric Kuebler¹, Joseph Tauskela², Amy Aylsworth², Xigeng Zhao², Jean-Philippe Thivierge¹

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2-C-72 Cortical spreading depression induces a transient disruption of the blood-brain barrier prevented by rho-kinase inhibition and associated with increased transcytosis

Baptiste Lacoste¹, Homa Sadeghian¹, Roberto Rosa¹, Tao Qin¹, Cenk Ayata¹, Chenghua Gu¹

¹Harvard University

2-C-73 A graph theoretical approach to altered resting state fMRI cortical networks in Multiple Sclerosis

Sue-Jin Lin¹, Aiping Liu¹, Alex MacKay¹, Irene Vavasour², Brenda Kosaka², Samantha Beveridge¹, David Li³, Anthony Traboulsee¹, Yinshan Zhao¹, Roger Tam³, Silke Appel-Cresswell¹, Martin McKeown¹

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³University of British Columbia Hospital

2-C-75 A comprehensive database of cell-type specific marker genes for the mammalian brain

Burak Mancarci¹, Ogan Mancarci¹, Lila Toker¹, Shreejoy Tripathy¹, Paul Pavlidis¹

¹UBC

2-C-76 Exercise modulates neural stem cell proliferation in a mouse model of Fragile-X syndrome

Alicia Meconi¹, Zoe Sharp¹, Brian Christie¹

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2-C-77 Using eye movements to identify early biomarkers of disease progression in Parkinson's patients with and without LRRK2 gene mutations

Julia Morris¹, Don Brien¹, Brian Coe¹, Naomi Visanji², Taneera Ghate², Anthony Lang², Connie Marras², Douglas Munoz¹

¹Queen's University, ²University Health Network

2-C-78 A variant of the presenilin-1 protein protects against an aggressive familial Alzheimer-related mutation

Jennifer Nyarko¹, Paul Pennington¹, Jason Maley¹, Darrell Mousseau¹

¹University of Saskatchewan

2-C-79 Age-dependent vulnerability to nicotine self-administration in mice correlates with expression of $\alpha 4^*$ nicotinic receptors

Anthony Renda¹, Nora Penty¹, Pragya Komal¹, Thomas Hoos¹, Raad Nashmi¹

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2-C-80 Determining the Efficacy of Endogenous Stem Cell Based Therapy as a Means to Promote Cognitive Recovery Post-Stroke in Adult Mice

Labeeba Nusrat¹, Nadia Sachewsky¹, Andrey Son¹, Dale Corbett², Cindi Morshead¹

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2-C-81 Functional Impairment among children with neurodevelopmental disorders in Abeokuta, Nigeria

Adeniran Okewole¹

¹Neuropsychiatric Hospital Aro

2-C-82 Evidence of motor neuron specific misfolded SOD1 in wild type mice

Megan O'Neill¹, Catherine Cowan¹, A. Jane Roskams², Neil Cashman¹

¹University of British Columbia, ²Allen Institute for Brain Science

2-C-83 Early cell death in oligodendrocytes measured by spectral changes of the fluorescent nuclear dye acridine orange

Jason Plemel¹, Michael Keough¹, Andrew Caprariello¹, Shigeki Tsutsui¹, Ileana Micu¹, Evelyn Manford¹, V. Wee Yong¹, Peter Stys¹

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2-C-84 Blocking the propagation of misfolded SOD1 using small molecules as a potential treatment for ALS

T. Dean Airey¹, Leslie Grad¹, Neil Cashman¹

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2-C-85 Modulation of ARNT2, a neuroprotective transcription factor, as a regulator of neurodegenerative processes in models of multiple sclerosis

Tissa Rahim¹, Andrew Leung¹, Adam Yu¹, Jacqueline Quandt¹

¹University of British Columbia

2-C-86 The comparative predictive value of early treatment response in antipsychotic-naïve patients with first-episode psychosis: haloperidol versus olanzapine

Sean Rasmussen¹, Patricia Rosebush¹, Michael Mazurek¹

¹McMaster University

2-C-87 Longitudinal Magnetic Resonance Spectroscopy Changes in Premanifest Huntington's Disease

Bretta Russell-Schulz², Terri Petkau², Blair Leavitt², Alex MacKay²

¹UBC MRI Research Centre, ²University of British Columbia

2-C-88 Loss of the Huntington disease-associated palmitoylacyltransferase HIP14 in adulthood leads to sudden unexplained death, motor and psychiatric disturbances, and astrogliosis and microglial activation

Shaun Sanders¹, Matthew Parsons¹, Amber Southwell¹, Katherine Mui¹, Sonia Franciosi¹, Lynn Raymond¹, Michael Hayden¹

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2-C-89 Does multi-trauma worsen the outcome of traumatic brain injury?

Sandy Shultz¹, Stuart McDonald²

¹The University of Melbourne, ²La Trobe University

2-C-90 Improving molecular diagnostic predictions in infantile epileptic encephalopathies using structural modelling of SCN1A

Alexander Smith¹, Gemma Pinchin¹, Tara Klassen¹

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2-C-91 Synaptic scaling in cultured neurons from the YAC128 mouse model of Huntington disease

Amy Smith-Dijk¹, James Mau¹, Lynn Raymond¹

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2-C-92 Modifying lipid rafts promotes regeneration and functional recovery

Nardos Tasew¹, Andrea Mothe², Alireza Shabanzadeh², Paromita Banerjee², Philippe Monnier²

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2-C-93 Optogenetic stimulation of thalamocortical projections to promote structural plasticity and recovery of function after somatosensory cortex stroke

Kelly Tennant¹, Craig Brown¹

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2-C-94 Dynamic changes in dendritic spine number in an animal model of Multiple Sclerosis

Megan Verbeek¹, Kristin Milloy¹, Shaona Acharjee², Quentin Pittman², Adrienne Benediktsson¹

¹Mount Royal University, ²University of Calgary

2-C-95 5-HT6 serotonin receptor is a new therapeutic target in Neurofibromatosis type 1: the first GPCR regulated by neurofibromin

Deraredj Wissem¹, Séverine Chaumont², Laetitia Cobret³, Hélène Benedetti³, Philippe Marin², Séverine Morisset-Lopez³

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2-C-96 Studying the neuronal activity changes in the motor cortex after deep brain stimulation at the subthalamic nucleus of Parkinson's disease model rat

Cheng Wei Wu¹

¹National Tsing Hua University

2-C-98 Glycine rescues impaired hippocampal synaptic plasticity in Female Fmr1 heterozygous knockout mice

Suk-yu Yau¹, Jason Chiu¹, Erica Truesdell¹, Brett Hryciw¹, Christine Chiu¹, Brennan Eadie¹, Brian Christie¹

¹University of Victoria

2-C-99 Identification of a Novel Modulator of Apolipoprotein E in Astrocytes

Shahab Zareyan¹, Jianjia Fan¹, Iva Kulic¹, Yoko Shimizu², Tom Pfeifer², Cheryl Wellington¹

¹Djavad Mowafaghian Centre for Brain Health, ²The Centre for Drug Research and Development

2-C-100 Downregulation of MIF by NFκB signaling under hypoxia accelerated neuronal loss during stroke

Si Zhang¹

¹University of British Columbia

D - Sensory and Motor Systems

2-D-101 Electrophysiological investigation of TMC9 in mechanotransduction processes

Lou Beaulieu-Laroche¹, Albena Davidova¹, Reza Sharif-Naeini¹

¹McGill University

2-D-102 Relationship between neck muscle neural control and biomechanics

Jason Fice¹, Gunter Siegmund², Jean-Sebastien Blouin¹

¹University of British Columbia, ²MEA Forensic Engineers and Scientists

2-D-103 Differential Patterns of Projections to the Posterior Auditory Field in Early- and Late-Deaf Cats

Blake Butler¹, Stephen Lomber¹

¹University of Western Ontario

2-D-104 In vivo, mesoscale voltage imaging of cortical dynamics as a platform for investigating mouse models of neurodegenerative and psychiatric disease

Allen Chan¹, Majid Mohajerani², Jeffrey LeDue¹, Yu Tian Wang¹, Timothy Murphy¹

¹University of British Columbia, ²University of Lethbridge

2-D-105 A combined optogenetic and fMRI approach for the study of cerebellum-to-cerebrum connections

Katrina Choe¹, Paul Mathews¹, Ka-Hung Lee¹, Andrew Frew¹, Roger Woods¹, Thomas Otis¹

¹University of California, Los Angeles

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2-D-106 Neural coding strategies used by the vestibular system are matched to the statistics of natural stimuli

*Kathleen Cullen*¹, Mohsen Jamali¹, Jerome Carrier¹, Adam Schneider¹, Maurice Chacron¹

¹McGill Univ

2-D-107 Prolonged cognitive-motor impairments in children with a history of concussion

*Marc Dalecki*¹, Lauren Sergio¹

¹York University

2-D-108 Suppression of vestibulocollic reflexes during head movements

*Patrick Forbes*¹, Jason Fice², Alfred Schouten³, Gunter Siegmund⁴, Jean-Sébastien Blouin²

¹University of British Columbia/Delft University of Technology, ²University of British Columbia, ³Delft University of Technology, ⁴MEA Forensic Scientists & Engineers

2-D-109 Switch in the type of t-SNARE protein during trafficking of the transient receptor potential vanilloid 1 (TRPV1) in a model of inflammatory pain

*Sahar Jaffal*¹

¹McGill

2-D-110 Mere Expectation of Haptic Feedback Facilitates Shift from Pantomimed to Natural Grasp

*Nathan Katz*¹, Robert Whitwell², James Enns², Melvyn Goodale¹

¹University of Western Ontario, ²University of British Columbia

2-D-111 Cumulative activation effect predicts faster reaction times compared to startle only related activity

*Michael Kennefick*¹, Paul van Donkelaar¹, Anthony Carlsen²

¹University of British Columbia, ²University of Ottawa

2-D-112 The influence of somatosensory feedback on visuo-motor adaptation

*Sajida Khanafer*¹, Keri-Lyn Andrus¹, Erin Cressman¹

¹University of Ottawa

2-D-113 Optogenetic Silencing of Mouse Primary Visual Cortex Affects Orientation Adaptation

*Jillian King*¹, Nathan Crowder¹

¹Dalhousie University

2-D-114 Real-time in vivo measurement of corticostriatal afferent activity during skill learning

*David Kupferschmidt*¹, Guohong Cui², David Lovinger¹

¹NIH / NIAAA, ²NIH / NIEHS

2-D-115 Chloride dysregulation causes disproportionate disinhibition of excitatory interneurons in spinal dorsal horn: implications for neuropathic pain

*Kwan Lee*¹, Kwan Yeop Lee¹, Steven Prescott¹

¹Sickkids hospital, University of Toronto

2-D-116 Subsaccadic FEF microstimulation induces pupil dilation

*Sebastian Lehmann*¹, Brian Corneil¹

¹University of Western Ontario

2-D-117 Postural Threat Influences Vestibular-Evoked Muscular Responses

*Shannon Lim*², Taylor Cleworth², Jean-Sébastien Blouin², J. Timothy Inglis², Mark Carpenter²

¹University of British Columbia, ²The University of British Columbia

2-D-118 Is reduced cutaneous sensitivity predictive of weakened synaptic coupling between skin and muscle in the elderly?

*Ryan Peters*¹, Monica McKeown¹, Mark Carpenter¹, Tim Inglis¹

¹University of British Columbia

2-D-119 Asymmetrical medical geniculate body volume in people with one eye

*Stefania Moro*¹, Krista Kelly¹, Larissa McKetton¹, Jennifer Steeves¹

¹York University

2-D-120 RAGE-dependent sensitization of sensory neurons innervating airway submucosal glands: possible role in airway hypersecretion

*Manoj Nair*¹, Yasuhiko Yamamoto², Juan Ianowski¹, Veronica Campanucci¹

¹University of Saskatchewan, ²Kanazawa University

2-D-121 Activation of glutamate receptors in rat dural blood vessels mediates vasodilation

*Melissa O'Brien*¹, Xudong Dong¹, Brian Cairns¹

¹University of British Columbia

2-D-122 Does plasticity in muscle afferent reflex pathways accompany cross-education of the wrist flexors?

*Gregory Pearcey*¹, Trevor Barss¹, Yao Sun¹, Taryn Klarner¹, E Paul Zehr¹

¹University of Victoria

2-D-123 α 5GABAA receptors mediate tonic inhibition and central sensitization in the dorsal horn of the spinal cord

*Jimena Perez-Sanchez*¹, Robert Bonin¹, Louis-Etienne Lorenzo¹, Charalampos Labrakakis², Erica Bridgwater³, Beverly Orser³, Yves De Koninck¹

¹CRUSMQ, Université Laval, ²University of Ioannina, ³University of Toronto

2-D-124 Spatial transformations of the vestibular control of standing balance

*Brandon Rasman*¹, Brian Dalton², J Timothy Inglis¹, Jean-Sébastien Blouin¹

¹University of British Columbia, ²University of Oregon

2-D-125 Role of the Cav3-Kv4 complex in mediating synaptic learning in cerebellar granule cells

*Arsalan Rizwan*¹, Gerald Zamponi¹, Ray Turner¹

¹The University of Calgary

2-D-126 Natural scene movie responses are more precise in synchronized than desynchronized cat V1

*Martin Spacek*¹, Nicholas Swindale¹

¹University of British Columbia

2-D-127 The functional organization of local neural networks providing input to single cortical neurons

*Adrian Wertz*¹, Stuart Trenholm¹, Botond Roska¹

¹FMI

E - Homeostatic and Neuroendocrine Systems

2-E-128 cFos expression in newborn chicks: relationship to sleep and waking

*Aimee Chan*¹, Si Han Li¹, Maria Pompeiano¹

¹McGill University

2-E-129 Hypothalamic CRH neurons are an entry point for a circuit that drives stress coping behavior

*Tamás Füzesi*¹, Jaclyn Wamsteeker Cusulin¹, Jaideep Bains¹

¹University of Calgary

2-E-130 The Role of Ghrelin in the Mediation of the Stress Response in Female Mice

*Rim Khazall*¹, Zack Patterson¹, Meheria Arya¹, Alfonso Abizaid¹

¹Carleton University

2-E-131 Sex-specific consequences of neonatal stress on laryngeal chemoreflex stimulation in rat pups: Contribution of excitatory currents onto key brainstem regions

*Richard Kinkead*¹, Cécile Baldy¹, Simon Chamberland¹, Richard Kinkead¹

¹Université Laval

2-E-132 D2 autoreceptor function is intact after diet induced obesity

*Kimberley Pitman*¹, Michael Drysdale², Manpreet Kaur², Jennifer Thompson², Stephanie Borgland²

¹University of British Columbia, ²HBI University of Calgary

F - Cognition and Behavior

2-F-133 Probing procedural strategy with a spatial working memory task: A potential marker of intact frontal function

*Alenka Bullen*¹, Robert Marino¹, Ron Levy¹

¹Queen's University

2-F-134 Morphine withdrawal critically involves spinal P2X7 receptors

*Nicole Burma*¹, Tuan Trang¹

¹University of Calgary

2-F-135 Variations in brain activity as a function of hand/target visual feedback availability

*Darian Cheng*¹, Krista Fjeld¹, Gordon Binsted¹

¹University of British Columbia

2-F-136 Disruption of AMPA receptor endocytosis blocks context-dependent behavioral sensitization to amphetamine

*Fiona Choi*¹, Yu Tian Wang², Anthony Phillips³

¹Institute of Mental Health, UBC, ²UBC, ³Institute of Neurosciences, Mental Health and Addiction, UBC

2-F-137 Stress and personality interact to modulate the neural response to food cues

*Selin Neseliler*¹, Kevin Larcher¹, Beth Tannenbaum¹, Maria Zacchia¹, Jens Pruessner¹, Alain Dagher¹

¹McGill University

2-F-138 A novel procedure for establishing appetitive latent inhibition that is unaffected by disruption of regulated AMPA receptor endocytosis

*Carine Dias*¹, Donovan Ashby¹, Yu Tian Wang¹, Anthony Phillips¹

¹University of British Columbia

2-F-139 Neural networks in attention and reading

Marla Mickleborough¹, Layla Gould¹, Chelsea Ekstrand¹, Eric Lorentz¹, Tessa McKibben¹, Ron Borowsky¹

¹University of Saskatchewan

2-F-140 Hippocampal activity during contextual learning and virtual navigation in non-human primates

*Roberto Gulli*¹, Guillaume Doucet¹, Benjamin Corrigan¹, Sylvian Williams¹, Julio Martinez-Trujillo²

¹McGill University, ²University of Western Ontario

2-F-141 Locomotor effects of cocaine are enhanced by ghrelin delivered directly into the Nucleus accumbens

*Marianne Klein*¹, Lindsay Hyland², Alexander Edwards², Alfonso Abizaid²

¹University of São Paulo, ²Carleton University

2-F-142 Remembering in quadrants: Non-linear representation of mnemonic space in the primate brain

*Matthew Leavitt*¹, Adam Sachs², Julio Martinez-Trujillo³

¹McGill University, ²Ottawa Hospital Research Institute, University of Ottawa,

³University of Western Ontario

2-F-143 How to achieve and stay at the top percentile: practices pattern analysis from mobile computerized cognitive trainings

*Conny Lin*¹, Mark Baxter², Catharine Rankin¹, Paul Nussbaum³

¹University of British Columbia, ²Fit Brains By Rosetta Stone, ³University of Pittsburgh School of Medicine

2-F-144 Sensory Afferents Activated by Gentle Touch Contribute to Self-Grooming and Social Behaviour

*Mireille Desrochers-Couture*¹, Robert Bonin¹, Yves De Koninck¹, Anna Lomanowska¹

¹Laval University

2-F-145 Feeling 'blue' and seeing 'red': Associations of emotion and colour in variants of the Stroop task

*Eric Lorentz*¹, Marla Mickleborough¹, Layla Gould¹, Chelsea Ekstrand¹, Ron Borowsky¹

¹University of Saskatchewan

2-F-146 A glycine receptor subunit homologue, AVR-14, alters short-term memory in an interstimulus interval-dependent manner in *C. Elegans*

*Troy McDiarmid*¹, Evan Ardiel¹, Catharine Rankin¹

¹University of British Columbia

2-F-147 CaMKII mediates input-specific early odor preference learning in rats

*Shirin Modarresi*¹, Qi Yuan¹

¹Memorial University of Newfoundland

2-F-148 The synthetic tetrahydroprotoberberine d-Govadine facilitates extinction of conditioned place preference induced by d-amphetamine or food reward

*Maya Nesbit*¹, Carine Dias¹, Anthony Phillips¹

¹University of British Columbia

2-F-149 Approach-avoidance processing: the role of nucleus accumbens shell D2 receptors in conflict resolution

*David Nguyen*¹, Victoria Fugaru¹, Suzanne Erb¹, Rutsuko Ito¹

¹University of Toronto

POSTER SESSION 2 – TUESDAY, MAY 26, 2015

2-F-150 The effect of reduced neurogenesis on visuo-spatial learning and memory in the GFAP-TK rat.

Timothy O'Leary¹, Jason Snyder¹

¹University of British Columbia

2-F-151 Catching the same wave: Successful teamwork is linked to between-brain synchrony

Ana Pesquita¹, Caroline Szymanski², Allison Brennan³, Dionysios Perdiki², James Enns¹, Müller Viktor², Ulman Lindenberger²

¹University Of British Columbia, ²Max Planck Institute for Human Development, ³Simon Fraser University

2-F-152 Toluene, Hippocampus Structure and Recognition Memory: adult and adolescent rats

Nino Pochkhidze¹

¹Ilia state university, I.Beritashvili center of Experimental Biomedicine

2-F-153 Adult neurogenesis increases preference for future rewards

Desiree Seib¹, Ru Qi Yu¹, Stan Floresco¹, Jason Snyder¹

¹University of British Columbia

2-F-154 ERPs differentially reflect automatic and deliberate processing of the functional manipulability of objects

Christopher Madan¹, Yvonne Chen¹, Anthony Singhal¹

¹University of Alberta

2-F-155 Effects of an acute bout of moderate-intensity aerobic exercise on motor learning in a continuous tracking task.

Nick Snow¹, Cameron Mang¹, Marc Roig², Michelle McDonnell³, Kristin Campbell¹, Lara Boyd¹

¹University of British Columbia, ²McGill University, ³University of South Australia

2-F-156 Single-trial Decoding of Visual Attention from Local Field Potentials in the Primate Lateral Prefrontal Cortex

Sébastien Tremblay¹, Guillaume Doucet¹, Florian Pieper², Adam Sachs³, Julio Martinez-Trujillo⁴

¹McGill University, ²University Medical Center Hamburg-Eppendorf,

³University of Ottawa, ⁴Western University

2-F-157 Targeted pharmacogenetic interrogation of a fear memory network

Gisella Vetere¹, Anne Wheeler¹, Justin Kenney¹, Leonardo Restivo¹, Sheena Josselyn¹, Paul Frankland¹

¹Hospital for Sick Children

2-F-158 Long-term memory formation is required for training-associated changes in brain structure volume

Dulcie Vousden¹, Matthijs van Eede¹, Adelaide Yiu¹, Leigh Spencer Noakes¹, Brian Nieman¹, Mark Henkelman¹, Sheena Josselyn¹, Paul Frankland¹, Jason Lerch¹

¹University of Toronto

2-F-159 Effects of pre and post-training administration of glucose and fructose: the importance of non-specific interpretations for memory consolidation

Paul Marshall¹, Thomas Horman¹, Francesco Leri¹

¹University of Guelph

G - Novel Methods and Technology Development

2-G-160 Development of an intravital multi-plane multiphoton microscopy platform for functional cellular imaging in living mice

Erik Bélanger¹, Feng Wang¹, Sylvain Côté¹, Daniel Côté¹, Yves De Koninck¹

¹Université Laval

2-G-161 Self-directed, high-throughput, and automated mouse motor-learning home cage assays

Federico Bolaños¹, Gergely Silasi¹, Jamie Boyd¹, Jeff LeDue¹, Stephen Scott¹, Timothy Murphy¹

¹UBC

2-G-162 Assessing connectivity in real neuronal networks from cellular activity

Patrick Desrosiers¹, Simon Labrecque¹, Paul De Koninck¹, Daniel Côté¹

¹Université Laval

2-G-163 MiniPromoters Driving PAX6-like Retinal Expression Designed from Bioinformatically Predicted Regulatory Regions

Jack Hickmott¹, Chih-yu Chen¹, David Arenillas¹, Yifeng Li¹, Laurie Molday¹, Andrea Korecki¹, Siu Ling Lam¹, Russell Bonaguro¹, Michelle Zhou¹, Alice Chou¹, Sanford Boye², William Hauswirth², Robert Molday¹, Wyeth Wasserman¹, Elizabeth Simpson¹

¹University of British Columbia, ²University of Florida

2-G-164 Localized light-induced stimulation of hippocampal neurons with cell surface-bound gold nanoparticles

Flavie Lavoie-Cardinal¹, Eric Bergeron², Charleen Salesse¹, Michel Meunier², Paul De Koninck¹

¹Université Laval, ²Ecole Polytechnique de Montréal

2-G-165 A Cortical Thickness Growth Model for Neurodegenerative Analysis

Poay Hoon Lim¹, Wee Keong Lim²

¹Polytechnique Montreal & CHU Sainte-Justine, ²Dawson College & Marianopolis College

2-G-166 NeuroFluor CDr3: A Novel Tool for the Detection of Live CNS and Human Pluripotent Stem Cell-Derived Neural Stem and Progenitor Cells

Carmen Mak¹, Vivian Lee¹, Sam Lloyd-Burton¹, Allen Eaves², Terry Thomas¹, Sharon Louis¹

¹STEMCELL Technologies Inc., ²Terry Fox Laboratory, BC Cancer Agency

2-G-167 Effective Gene Silencing in Brain and Spinal Cord In Vivo Models Mediated by Lipid Nanoparticle Technology

James Taylor¹, Oscar Seira², Jie Liu², Aysa Ansari¹, David Zwaenepoel¹, Colin Walsh¹, Anitha Thomas¹, Timothy Leaver¹, Andre Wild¹, James Taylor¹, Euan Ramsay¹, Pieter Cullis², Wolfram Tetzlaff²

¹Precision NanoSystems Inc., ²University of British Columbia

2-G-168 Neuromodulatory opto-fMRI

Bechara Saab¹, Joanes Grandjean², Edward Mann³, Markus Rudin²

¹University of Zürich, ²Swiss Federal Institute of Technology, ³University of Oxford

2-G-169 A deterministic, rapid-access microscope and monitoring system for high-throughput data acquisition of neuron activity in the awake brain

Kelly Sakaki¹, Kurt Haas¹

¹Djavad Mowafaghian Centre for Brain Health

2-G-170 Plasma Soluble Prion Protein as a Potential Biomarker for the Traumatic Brain Injury

Nam Pham¹, Thomas Sawyer², Yushan Wang², Rhonda Shishkin¹, Changiz Taghibiglou¹

¹University of Saskatchewan, ²Defence Research and Development Canada

2-G-171 Genome-wide association for sensory neuron function in *C. elegans* using an automated behavioural tracking system.

Tiffany Timbers¹, Katherine Lee¹, Donald Moerman², Michel Leroux¹

¹Simon Fraser University, ²University of British Columbia

2-G-172 Mesoscale transcranial cortical imaging with fast kinetic genetic-encoded glutamate sensor - iGluSnFr

Yicheng Xie¹, Timothy Murphy¹

¹University of British Columbia

IBRO – International Brain Research Organisation

2-IBRO-175 Nociceptive hypersensitivity induced by Herpes Simplex-1 is a consequence of leukocyte migration and production of inflammatory mediators at infected dorsal root ganglia

Jaqueline Silva¹, Jhimmy Talbot¹, Alexandre Lopes¹, Thiago Cunha¹, Fernando Cunha¹

¹Ribeirao Preto Medical School of University of Sao Paulo

2-IBRO-176 Effects of Cold Exposure on Behavioral and Electrophysiological Parameters. Related with Hippocampal Function in Rats

Hajar el Marzouki¹, Youssef Aboussaleh¹, Sonar Bitiktas², Cem Suer², Aise Seda Artis³, Nazan Dolu², Ahmed Ahami¹

¹Ibn Tofail University Faculty of Sciences, Kénitra, ²Erciyes University School of Medicine, ⁴Istanbul Medeniyet University Medical Faculty

2-IBRO-177 The neuroprotective effects of recombinant erythropoietin isoform with low glycosilation is mediated by activation of BCL2 pathway

Carolina Castillo¹, Angela Hidalgo¹, Tiare Silva-Grecchi¹, Jorge Fuentealba¹, Jorge Toledo¹

¹Universidad de Concepción

2-IBRO-178 Cell-type specific chloride dynamics in epilepsy.

Hayley Tomes¹, Lauriston Kellaway¹, Joseph Raimondo¹

¹University of Cape Town

2-IBRO-179 Characterization of TDP43 misfolding in an experimental model of ALS/FTD

Leslie Bargsted¹, Danilo Medinas¹, Pablo Rozas¹, Claudio Hetz¹, Soledad Matus²

¹University of Chile, ²Neurounion Foundation



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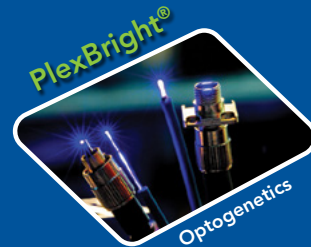
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Blackrock Microsystems Booth 203

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Booth 210

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Parkinson Society Canada - Société Parkinson Canada

Table Top 6

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Booth 109

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Society for Neuroscience Booth 105

The Society for Neuroscience (SfN) is a nonprofit membership organization of nearly 38,000 scientists and physicians from around the world who study the brain and nervous system. The Society publishes The Journal of Neuroscience, the most-cited journal in the field, as well as the new open-access journal eNeuro. Embodying an emerging scientific vision that offers a new experience for authors and readers, eNeuro publishes high-quality, broad-based, peer-reviewed research focused solely on the field of neuroscience. Stop by stand 43 to learn about becoming a member of SfN and sharing your research with the global scientific community.

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STEMCELL Technologies, Inc. Booth 108

STEMCELL Technologies Inc. is a leader in the development of specialty cell culture media, cell separation products and ancillary reagents to support life science research. The NeuroCult™ product line includes nearly 30 different media products, culture assays and differentiation kits for primary mammalian neural stem cells, as well as media supplements for primary neuronal culture. The STEMdiff™ Neural System is a suite of reagents for derivation, expansion and cryopreservation of human pluripotent stem cell-derived neural progenitor cells. Learn from NeuroCult™ and STEMdiff™ protocols, educational videos, webinars and mini-reviews at www.stemcell.com.

Email info@stemcell.com
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Stoelting Co. Booth 103

Stoelting Co. has been an innovator in producing superior neuroscience research equipment since 1886. Our unique product line includes a variety of behavioral testing equipment, including ANY-maze™ video tracking software, behavior apparatuses, stereotaxic equipment and surgical instruments. As the exclusive North American distributor of Ugo Basile products, Stoelting Co. is better able to serve customers, offering the finest, most extensive pain product line in the industry. At Stoelting, we have a strong commitment to support scientific research. We seek to offer only high quality, reliable instruments, with prompt, educated customer service from our staff of science professionals!

Email Lauren@StoeltingCo.com
Web www.StoeltingCo.com
Twitter [@StoeltingNeuro](https://twitter.com/StoeltingNeuro)

StressMarq Biosciences Inc. Table Top 1

StressMarq Biosciences Inc. is a life science company which supplies the worldwide research community with high quality reagents, primarily specialized antibodies, proteins, kits and small molecules. It specializes in the cellular stress and neuroscience sectors, with a focus in the latter on ion channel and transporter research products. The main clients are Universities, hospitals, research foundations, pharmaceutical and biotechnology companies all around the world. StressMarq reaches these clients through a wide number of direct and international distribution arrangements covering over 40 countries.

Email info@stressmarq.com
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Ted Pella, Inc.

Booth 111

Ted Pella, Inc. offers microscopy instruments and supplies worldwide, serving Neuroscience laboratories utilizing light, fluorescence, confocal and electron microscopes. We are manufacturer of the new PELCO easiSlicer™ vibratory microtome, the new standard in affordable, quality fresh tissue sectioning. Our instrument line includes Dosaka Microslicers, Motic light microscopes and digital cameras and the PELCO Biowave® Pro Microwave Tissue Processor. We provide brain matrices, surgical supplies, gold conjugates and lab reagents. We offer humidity chambers, wellplate inserts, glassware and glass bottom dishes. We carry PAP pens, microscope slides and coverslips, storage containers and a full line of histology supplies and equipment.

Email isales@tedpella.com
Web www.tedpella.com

TMS International

Booth 202

TMSi is specialized in high quality recording and analysis of a large variety of (electro)physiological parameters. We use unique amplifier technology, especially suited for use in "hostile" measurement environments, such as very noisy surroundings, in demanding ambulatory applications with potential movement artifacts or in cases with very poor electrode impedances. Our systems currently range from 2 to 72 channels.

Email caroline.klumper@tmsi.com
Web www.tmsi.com

Tucker-Davis Technologies Booth 208

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.

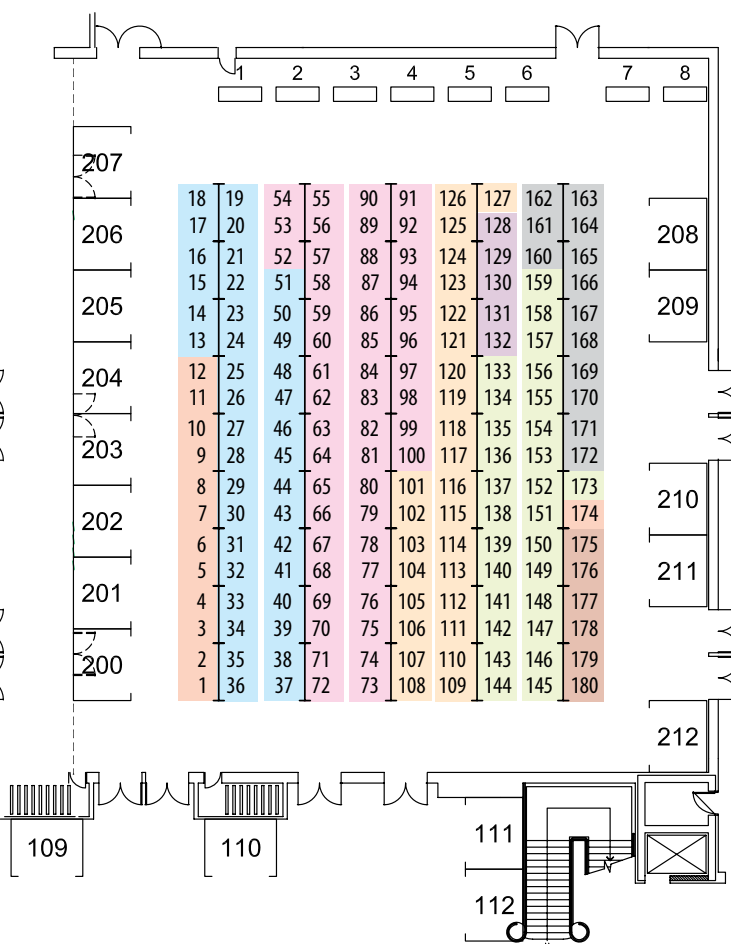
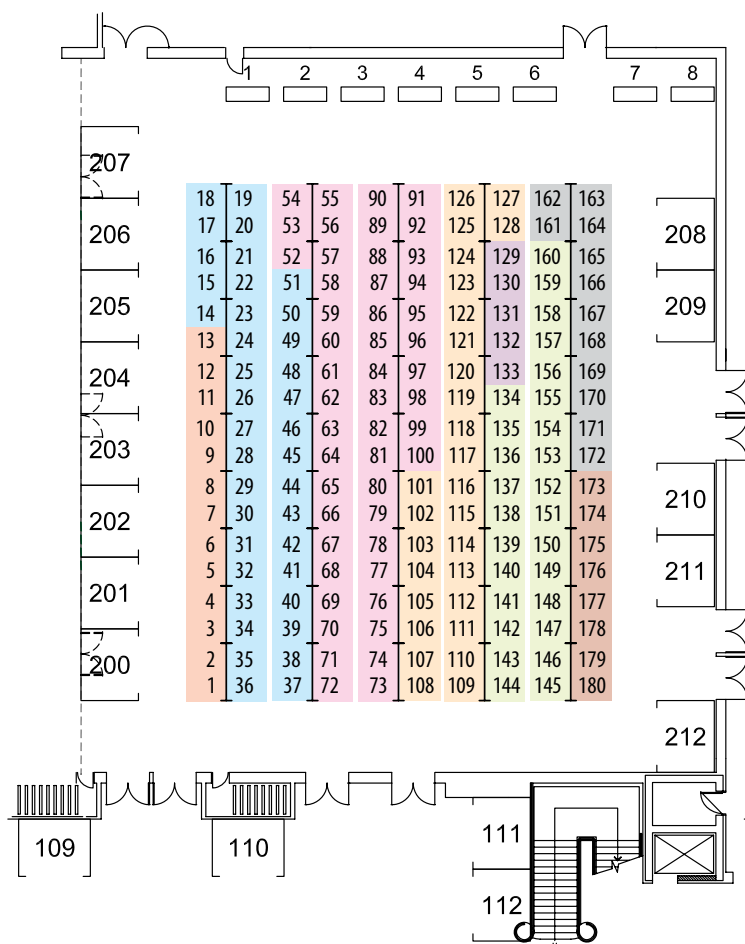
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Bayshore Ballroom DEF

Day 1 – Monday, May 25

Day 2 – Tuesday, May 26



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

IBRO International Brain Research Organisation



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