

39TH ANNUAL

FRONTIERS IN 2019 PHYSIOLOGY

MAY 2ND | MOUNT SINAI HOSPITAL

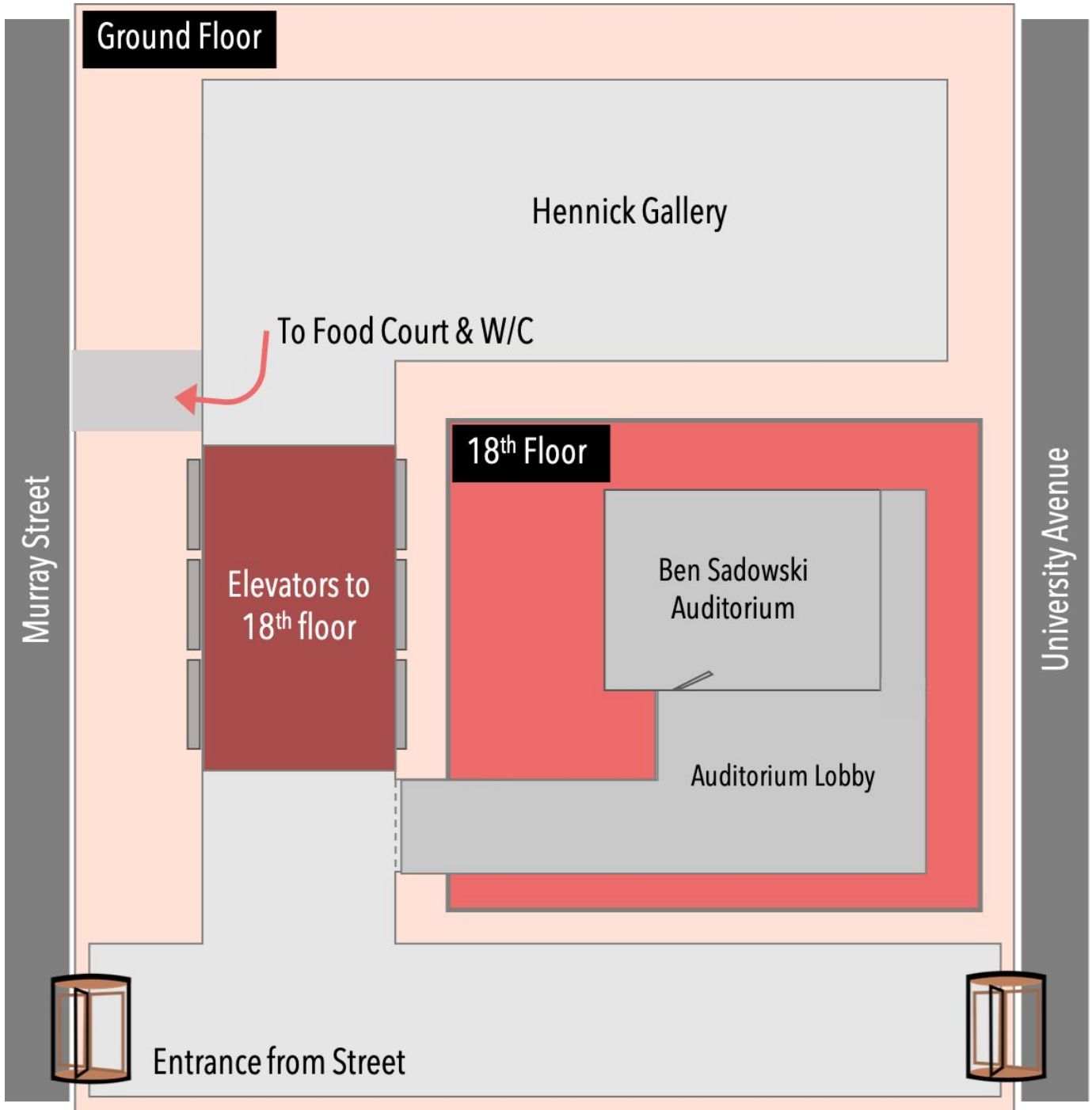


UNIVERSITY OF
TORONTO

Graduate Association for
Students in Physiology

CONFERENCE MAP

Mount Sinai Hospital



CONFERENCE PROGRAM

THURSDAY MAY 2ND, 2019
Mount Sinai Hospital

REGISTRATION & BREAKFAST

Hennick Family
Gallery

8:00AM – 8:45AM — CONTINENTAL BREAKFAST
8:30AM – 8:45AM — WELCOME ADDRESS
DR. SCOTT HEXIMER, FIP Co-Chairs

MORNING

9:10AM – 10:10AM — POSTER SESSION 1
Hennick Family Gallery
10:20AM – 11:20AM — ORAL SESSION 1
Ben Sadowski Auditorium (18th fl.)
Moderator: Ursula Nosi
11:20PM – 12:20PM — POSTER SESSION 2

KEYNOTE LECTURE

Ben Sadowski Auditorium
(18th fl.)

12:20PM – 1:20PM — INSIGHTS INTO CONDITIONED TASTE AVERSION
DR. RICHARD PALMITER
1:20PM – 1:35PM — DEPARTMENTAL PHOTO

LUNCH

Ben Sadowski Auditorium
(18th fl.)

1:40PM – 2:10PM — LUNCH (continued into Poster Session2)

AFTERNOON

Ben Sadowski Auditorium &
Lobby (18th fl.)

2:10PM – 3:10PM — POSTER SESSION 3
3:20PM – 4:20PM — ORAL SESSION 2
Moderator: Xavier Lee
4:20PM – 4:30PM — COFFEE BREAK
4:30PM – 5:30PM — ORAL SESSION 3
Moderator: Sammy Cai

RECEPTION & AWARDS

Hennick Family
Gallery

5:30PM – 6:30PM — RECEPTION
Award Ceremony


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MARTIN PRONOVOST, MBA
Directeur Développement des Affaires
Modèles et Services de Recherche

324 Rang Saint-Régis Nord, Saint-Constant, Québec, Canada J5A 2E7
Cell: 438 425 1749
martin.pronovost@crri.com • www.criver.com



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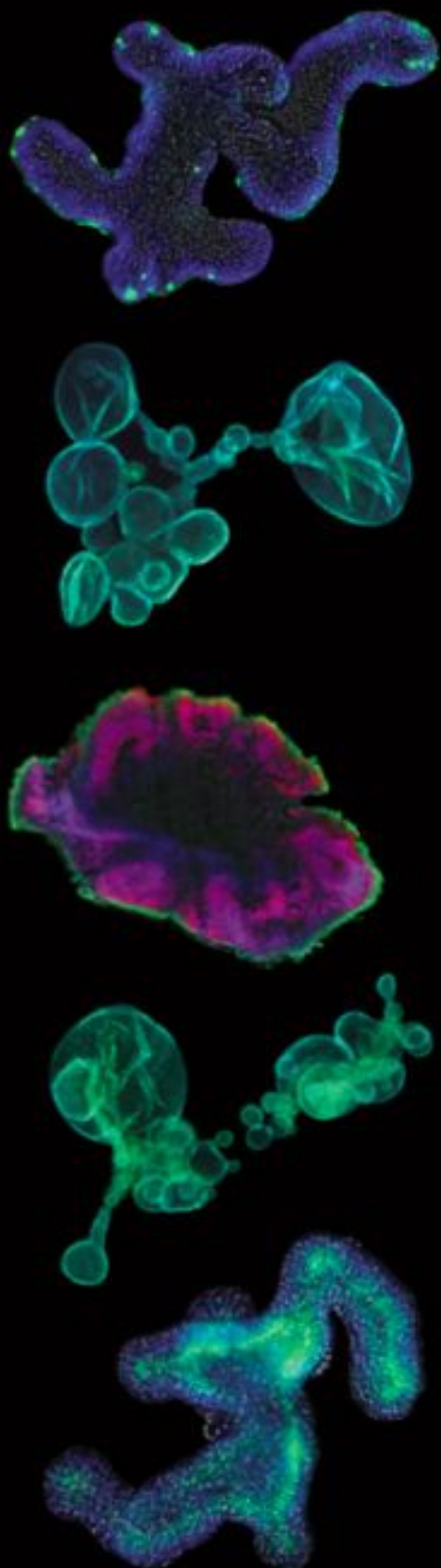


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ORAL SESSION 3



DR. RICHARD PALMITER

Howard Hughes Medical Institute, University of Washington

Dr. Richard Palmiter has been an Investigator at Howard Hughes Medical Institute since 1976 and a Professor of Biochemistry and Genome Sciences at the University of Washington School of Medicine since 1974. A native of Poughkeepsie, New York, he earned his BA in Zoology at Duke University in 1964. He then went on to complete his PhD in Biological Sciences at Stanford University in 1968.



Dr. Palmiter's work spans from molecular biology to animal physiology. In the 1970's, he began his career focused on examining the molecular mechanisms through which steroid hormones regulate gene transcription, finding that sex hormones regulate gene transcription required for egg white production in hens. He then explored the regulation and function of metallothionein genes, products of which bind heavy metals to protect against metal toxicity and oxidative damage.

Dr. Palmiter was the first to clone and introduce genes and proceeded to elucidate their regulatory elements. Dr. Palmiter is perhaps best known for his collaborative work with Dr. Ralph Banister at the University of Pennsylvania. They were the first to introduce functional genes into the genome of mice, rabbits, sheep and pigs. Together, they pioneered studies generating thousands of transgenic mouse models in order to examine many biological questions, including growth control, spermatogenesis, immunology and cancer.

More recently, Dr. Palmiter has used genetic and viral transduction techniques to discern neural circuits and neurotransmitter signaling that control behavior in mice. He is particularly interested in the regulation of neural circuits that control appetite. Specifically, it was discovered that feeding is inhibited by selective stimulation of parabrachial nucleus neurons that express calcitonin gene-related peptide (CGRP). He is currently focused on identifying downstream targets of CGRP neurons and how they mount appropriate responses to various threats. The functions of other parabrachial nucleus neurons that transmit taste, and salt and water balance signals are also being examined in his lab.

Dr. Palmiter has received numerous awards over the course of his career and has been a member of the National Academy of Sciences since 1984. With support from the National Institutes of Health, the Michael J. Fox Foundation and the Klarman Family Foundation, among others, he has published nearly 500 papers. The Department of Physiology and the Graduate Association of Students in Physiology at the University of Toronto are honored to welcome Dr. Richard Palmiter as the keynote lecturer for the 39th Annual Frontiers in Physiology Symposium.




MESSAGE FROM THE CHAIR

On behalf of the Department of Physiology, it gives me great pleasure to welcome everyone to the annual “Frontiers in Physiology Research Day”. This Annual Symposium highlights the outstanding research and leadership efforts of our graduate trainees, who have organized and run this event for the past 39 years. Today will showcase the exciting and innovative work conducted by our trainees, who represent the future of Physiology in Canada, and around the world. We are extremely proud of their accomplishments and dedication to science and research, and look forward to an outstanding day of presentations.

It is also my pleasure to welcome Dr. Richard Palmiter to the Department of Physiology. Dr. Palmiter is an internationally recognized Investigator of the Howard Hughes Medical Institute and Professor of Biochemistry and Genome Sciences at the University of Washington School of Medicine in Seattle. Among his many accomplishments, Dr. Palmiter was Elected to the National Academy of Sciences in 1998 and was the recipient of the prestigious Julius Axelrod Medal in 2004. His ground-breaking work aims to understand the neural circuits involved in feeding behaviours and appetite control. The novel genetic tools and techniques that he has developed to study the functional role of different neuronal subtypes in this process have made him one of the world’s leading experts in this area. Dr. Palmiter has published over 120 scientific articles and his work has been cited over 8,000 times by researchers in the field.

Special thanks and acknowledgement is owed today to Ms. Elizabeth Eng, Ms. Bona Kim, and Mr. Scott Frendo-Cumbo, FIP co-Chairs and Vice-Presidents of the Graduate Association of Students in Physiology (GASP). Elizabeth, Bona, Scott and their team have done a brilliant job in spearheading the process to ensure the success of this day. A special thank you also to Mr. Sammy Cai, President of GASP, and to everyone who helped make this year’s research day possible.

We hope you enjoy the day. We invite you to take full advantage of this opportunity for cross-platform interaction and collaboration between members of our exceptional scientific community.

T  make this day an enormous success!

Best regards,
Scott P. Heximer
Interim Chair, Department of Physiology
Faculty of Medicine
University of Toronto

MESSAGE FROM THE VPs

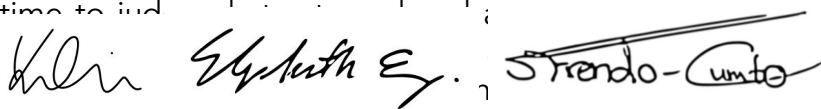
On behalf of Graduate Association for Students in Physiology (GASP) and the Frontiers in Physiology Planning Committee (FIP Comm), we are very excited to present the 39th annual Frontiers in Physiology (FIP) Research Symposium. Today, trainees from all four Physiology platforms come together to showcase their cutting-edge research and celebrate the diverse achievements within the Department of Physiology. We hope that this symposium increases intradepartmental awareness of the innovative work being done in our various platforms and that all attendees benefit from the exchange of scientific ideas as well as the development of new collaborations.

This year, we are honoured to welcome Dr. Richard Palmiter as the FIP keynote lecturer. Dr. Palmiter is an investigator at the Howard Hughes Medical Institute and a Professor of Biochemistry at the University of Washington. He is world renowned for his work in the development of transgenic mouse models and his use of these models to dissect neural circuits involved in innate behaviours. We are very excited to learn more about his research. On behalf of the Department of Physiology, we would like to take this opportunity to thank Dr. Palmiter for accepting our invitation and welcome him to the University of Toronto.

In addition to our esteemed keynote speaker, the success of FIP 2019 is dependent on the combined efforts of several individuals and groups. We would like to extend our gratitude to everyone involved in the planning, organizing and running of FIP. We are especially grateful to everyone on FIP Comm for their hard work and dedication in planning FIP as well as to everyone on GASP for their support. Special thanks to Dr. Denise Belsham for her help and guidance in planning FIP. We are also thankful for the support of the Department of Physiology, and all of the platforms for their equal contributions to this event. Thank you to our former Chair, Dr. Graham Collingridge, our interim Chair, Dr. Scott Heximer, the Graduate Coordinators, Drs. Zhong-Ping Feng and Douglas Tweed, and administrative staff Paula Smellie, Jenny Katsoulakos, Rosalie Pang and Colleen Shea. Thank you to all of those who generously volunteered their time to help make this event a success.

We appreciate all of your support and thank you for sharing your time with us. But certainly not least, thank you to all of our institutional and commercial sponsors for their support. Without such support of research and training, FIP 2019 would not be possible.

Sincerely,



POSTER SESSION 1
9:10 am – 10:10 am
Hennick Family Gallery

P1-B. Using Weight Mirrors to Improve Feedback Alignment

Mohamed Akrouf, Collin Wilson, Peter Humphreys, Timothy Lillicrap, Douglas Tweed

P2-B. Using Weight Mirrors to Improve Feedback Alignment

Dhekra Al-Basha, Steven A. Prescott

P3-B. The role of endogenous cellular prion protein in brain synaptic function

Aeen Ebrahim Amini, John Georgiou, Changiz Taghibiglou, Graham L. Collingridge

P4-B. Persistent cognitive impairment after a double-hit of inflammation and general anesthesia

Shahin Khodaei, Dian-Shi Wang, Beverley A. Orser

P5-B. Ketamine prevents an anesthetic-triggered persistent increase in extrasynaptic GABAA receptor activity via NMDA receptor-independent mechanisms

Winston Li, Agnes Crnic, Dian-Shi Wang, Beverley A. Orser

P6-B. Genome-wide association study (GWAS) of word reading: overlap with risk genes for neurodevelopmental disorders

Kaitlyn Price, Karen G Wigg, Yu Feng, Kirsten Blokland, Margaret Wilkinson, Gengming He, Elizabeth Kerr, Sharon Guger, Maureen W Lovett, Lisa Strug, Cathy L Barr

P7-B. Mapping gap junctions in the developing *C. elegans* connectome

Christine Rehaluk, Ben Mulcahy, Daniel Witvliet, Douglas Holmyard, Richard L. Schalek, Jeffrey W. Lichtman, Aravinthan D.T. Samuel, Mei Zhen

P8-B. Costate-focused multitask reinforcement learning

Collin Wilson, Bitu Behrouzi, Xuefei Liu, Douglas Tweed

P9-R. Differential DNA Methylation from Various Time-To-Freeze Periods of Dried Blood Spots

Bona Kim, Aya Sasaki, Alisa Kostaki, Kellie Murphy, Stephen Matthews

P10-C. Whole-cell proteomic characterization of region-specific cardiac fibroblasts isolated from adult mice subjected to myocardial infarction

Haisam Shah, Alison Hacker, Dylan Langburt, Bilal Hussain, Shin-Haw Lee, Meghan McFadden, Uros Kuzmanov, Hangjun Zhang, Yu-Qing Zhou, Anthony Gramolini, Scott P. Heximer



POSTER SESSION 1
9:10 am – 10:10 am
Hennick Family Gallery

P11-E. The Role of Secretagoin in Circadian Glucagon-like Peptide-1 Secretion

Andrew Biancolin, Alexandre Martchenko, Emilia Mitova, Everan Michalchyshyn, Jennifer Chalmers, Alessandro Doria, Josyf Mychaleckyj, Fiona Gribble, Frank Reimann, Brian Cox, Patricia Brubaker

P12-E. Vitamin B6 and N-acetylcysteine protect hypothalamic neurons from bisphenol A-mediated induction of neuropeptide Y gene expression

Neruja Loganathan, Emma K Mcllwraith, Denise D Belsham

P13-E. Specific microRNAs are regulated in hypothalamic neurons after exposure to the saturated fat palmitate and endocrine disrupting chemical bisphenol A

Emma K Mcllwraith, Denise D Belsham

P14-E. The role of Serotonin in postprandial lipid absorption and lipoprotein metabolism

Fitore Raka, Khosrow Adeli

P15-E. Role of the Intestinal Epithelial Insulin-Like Growth Factor-1 Receptor in Dietary Lipid Absorption

Arjuna Srikrishnaraj, Melanie Markovic, Patricia Brubaker

P16-E. Nitric Oxide Induces Spexin (Spx), Galanin Receptor 2 (GalR2) and Galanin Receptor 3 (GalR3) mRNA Independently of the cGMP/PKG Pathway and Enhances C/EBP- β Binding to the Spx 5' Regulatory Region

Andy Tran, Denise Belsham

P17-E. Effects of GABA and regulation of GABA synthesizing enzymes in hypothalamic neurons involved in energy homeostasis

Oriana Wong, Neruja Loganathan, Denise D Belsham

P18-R. The Intergenerational Effects of Synthetic Glucocorticoid Exposure During the Paternal Preconception Period

Christopher Casciaro, Alisa Kostaki, Stephen Matthews

P19-R. MRI, histochemical, and biochemical analyses show regional differences in the murine cervix during pregnancy

Antara Chatterjee, Lindsay Cahill, Kartik Jhaveri, John Sled, Wendy Whittle, Stephen Lye, Oksana Shynlova

P20-R. Development of Placenta specific gene sets to improve Gene Set Enrichment Analysis utility

Kendra Naismith, Brian Cox



ORAL SESSION 1
10:20 am – 11:20 am
Ben Sadowski Auditorium

O1-B. Multifaceted roles of the Fragile X Mental Retardation Protein in the developmental plasticity of postsynaptic receptors in the brainstem

Ankur Bodalia, Lu-Yang Wang

O2-B. MicroRNAs regulate cardiomyocyte proliferation in the early postnatal period

Shelly Chauhan, Shanna Stanley-Hasnain, Ludger Hauck, Daniela Grothe, Filio Billia

O3-E. Elucidating the Interactions between the Microbiome, Intestinal Immunity, and Circadian GLP-1 Secretion

Sarah Wheeler, Alexandre Martchenko, Dave Prescott, Patricia Brubaker

O4-R. Creating a 3D culture system using extracellular matrix derived from decellularized kidney and human induced pluripotent stem cells

Tonya Bongolan, Theresa Chow, Jennifer Whiteley, Laura Mazilescu, Matyas Hamar, Markus Selzner, Ian Rogers



POSTER SESSION 2
11:20 am – 12:20 pm
Ben Sadowski Auditorium Lobby

P21-B. Subthalamic nucleus neuronal activity during a choice-preference decision-making task in Parkinson's disease patients

Tameem M. Al-Ozzi, L.F. Botero Posada, A.L. Lopez Rios, W.D. Hutchison

P22-B. Sex differences in spinal DNA methylome and transcriptome after peripheral nerve injury.

Shahrzad Ghazisaeidi, Arun Ramani, Parisa Shooshtari, Amy Tu, Katherine Halievski, David Finn, Sofia Assi, Milind Muley, Vivian Wang, Ameet Sengar, Rosanna Weksberg, Michael Brudno, Michael W Salter

P23-B. Spike initiation properties of pyramidal neuron axons revealed by channelrhodopsin-based photostimulation

Mohammad Amin Kamaledin, Stephanie Ratté, Steven Prescott

P24-B. Characterizing the efficacy of negative allosteric modulators of $\alpha 5$ GABAA receptors in primary hippocampal neurons

Marc Anthony Manzo, Winston W. Li, Dian-Shi Wang, Beverley A. Orser

P25-B. Dysregulation of prefrontal cholinergic signalling in the TgF344 rat model of Alzheimer's disease

Saige K Power, Sridevi Venkatesan, Dr. Daniel W Sparks, Janice McNabb, Dr. JoAnne McLaurin, Dr. Evelyn K Lambe

P26-B. Deletion of complement cascade components C3 or Cd11b does not impact synapse strength or plasticity at Schaffer collateral-CA1 synapses

Eric W Salter, Sun-Lim Choi, Liam T Ralph, Junhui Wang, Fuzi Jin, Graham L Collingridge

P27-B. Chrna5 deletion and its modulation of habenulopeduncular neurotransmission

Sanghavy Sivakumaran, Yupeng Liu, Tianhui Chen, Daniel W Sparks, Evelyn K Lambe

P28-B. Alpha5 nicotinic receptors in the prefrontal cortex: built to resist?

Sridevi Venkatesan, Tianhui Chen, Yupeng Liu, Evelyn K Lambe

P29-C. The role of Alpha 11 Integrin in the initiation of pressure induced myofibroblast transformation and the progression of cardiac fibrosis following Myocardial Infarction.

Patrick Meagher, Robert Civitarese, Jean-Francois Desjardin, Antoinette Bugyei-Twum, Kim Connolly

P30-C. Novel Intracellular Interactors Regulate Membrane-Bound TNF Reverse Signalling

Yasaman Mostafaie, Jeffery T. Kroetsch, Darcy Lidington, Steffen-Sebastian Bolz



POSTER SESSION 2
11:20 am – 12:20 pm
Ben Sadowski Auditorium Lobby

P31-E. Epidermal Growth Factor Enhances Small Intestinal Growth in Combination with Glucagon-like Peptide-2 Independent of the Insulin-like Growth Factor-1 Receptor in Mice

Zivit Fesler, Emilia G. Mitova, Yasaman Nahaei, Patricia L. Brubaker

P32-E. Differential Expression of Intestinal Microvillus Proteins from Intestinal Epithelial Insulin-like Growth Factor-1 Receptor Knockout Mice With and Without Chronic Glucagon-Like Peptide-2 Treatment

Melanie A Markovic, Patricia L Brubaker

P33-E. Circadian Secretion of Glucagon-like Peptide-1 is Essential to Maintaining Diurnal Metabolic Homeostasis

Alexandre Martchenko, Sarah Wheeler, Matthew Clemenzi, Patrick Gurses, Patricia Brubaker

P34-E. The metabolism of palmitate to palmitoyl-CoA, but not ceramide, is required for the induction of spexin, galanin receptor 2, but not galanin receptor 3 mRNA in Hypothalamic neurons

Lu Wang, Andy Tran, Denise D Belsham

P35-E. Modeling Cystic Fibrosis Disease and Therapies in Patient Derived Tissues

Sunny Xia, Onofrio Laselva, Michelle Di Paola, Claire Bartlett, Tanja Gonska, Christine E. Bear, Nicola L. Jones

P36-E. JNK1 plays a causal role in palmitate-induced β -cell dysfunction in vivo

Justin Hou Ming Yung, Lucy Shu Nga Yeung, Ashraf Nahle, Khajag Koulajian, Adria Giacca

P37-R. Examining the maturation potential of ECM-specific coatings in the culture of pancreatic

Progenitors

Amanda Fantin, Jennifer Whiteley, Jorge Castillo-Prada, Ian Rogers

P38-R. Optimization and Evaluation of Autologous Human Platelet Lysate Isolation as a Novel Treatment for Recurrent Implantation Failure and Thin Endometrium

Tina Tu-Thu Ngoc Nguyen, Mitchell MacDougall, Stewart J. Russell, Clifford Librach

P39-R. Models demonstrate network properties of co-occurring polymorphisms can detect variants contributing to polygenic diseases

Andreea Obersterescu



POSTER SESSION 3
2:10pm – 3:10pm
Ben Sadowski Auditorium Lobby

P41-B. Are pallidal neurons involved in cognitive functions? : Preliminary Analysis
Erhan I. Alanazi, T.M. Al-Ozzi, K. Cheung, M. Hodaie, S. Kalia, A.M. Lozano, W.D. Hutchison

P42-B. The role of P2X7 signalling in sensory pain neurons
Megan Drupals, K. Halievski, A. Chen, M.W. Salter

P43-B. Synaptic mechanisms underlying the network state-dependent recruitment of the interneuron-specific interneurons in the mouse CA1 hippocampus
Xiao Luo, Alexandre Guet McCreight, Vincent Villette, Ruggiero Francavilla, Simon Chamberland, Frances K Skinner, Lisa Topolnik

P44-B. Anesthetic activation of GABAA receptors in astrocytes triggers a persistent increase in tonic inhibitory current in neurons through an IL-1 β and p38 MAPK pathway
Arsène Pinguelo, Kirusanthy Kaneshwaran, Gang Lei, Dian-Shi Wang, Beverley A. Orser

P45-B. Investigating molecular mechanisms through which SAD-1 kinase regulates synapse development
Neeraja Ramakrishnan, Jun Meng, Wesley Hung, Mei Zhen

P46-B. The role of autophagy in neuropathic pain
Theresa H. Tam, Michael W. Salter

P47-B. UBP714, a positive allosteric NMDAR modulator, restores long-term potentiation in a model of Fragile X Syndrome
Rasa Volianskis, John Georgiou, Guangyu Fang, Mark Irvine, Daniel T. Monaghan, David Jane, Graham L. Collingridge

P48-C. Generation of Phenotype-Stable Alveolar Epithelial Type II Cells from Human Induced Pluripotent Stem Cells
Ryungrae (Benedict) Kim, Ya-Wen Chen, Haibo Zhang

P49-E. Hepatic Fgf21 expression is under the regulation of the canonical Wnt signaling pathway
Yasaman Badakhshi, Weijuan Shao, Lili Tian, Tianru Jin

P50-E. Inflammatory and circadian mediators of orexigenic gene expression in the hypothalamus
Jim T. C. Chen, Andy Tran, Denise D. Belsham



POSTER SESSION 3
11:20 am – 12:20 pm
Ben Sadowski Auditorium Lobby

P51-E. Glucoregulatory Impact of Glucose Sensing in the Dorsal Vagal Complex
Jing Wen Li, Song-Yang Zhang, Battsetseg Batchuluun, Mona A. Abraham, Tony K. T. Lam

P52-E. Cell-specific vascular effects of insulin in models of restenosis
Xuefei Liu, Yusaku Mori, Simon Chiang, Luke Dingwell, June Guo, Prasad Dalvi, Mansoor Husain, Adria Giacca

P53-E. Using hESC to model pancreatic patterning and specification
Emily McGaugh, Cathy Iorio, Robert Screaton, Maria Cristina Nostro

P54-E. Deciphering the signaling pathways driving β -cells from human pluripotent stem cells
Frankie Poon, Roman Korytnikov, Yasaman Aghazadeh, Paraish S. Misra, M. Cristina Nostro

P55-R. Maternal BMI, breastfeeding and perinatal factors that influence early childhood growth trajectories: a scoping review
Kayla Abrego, Stephen Lye, Cindy-Lee Dennis

P56-R. Antenatal synthetic glucocorticoid programming of post-natal blood-brain barrier function
Elizabeth Eng, Alisa Kostaki, Stephen Matthews

P57-R. Prenatal Glucocorticoid Exposure Modifies Paternal Germ Cell MicroRNA Expression in Adult Male Offspring across Three Generations: Paternal Transmission
Connor Mabbott, Stephen Matthews

P58-R. Evaluating the effects of breastfeeding on carriers of obesity susceptibility genes through quantile regression
Susan Wamithi, Laurent Briollais, Stephen Lye

P59-R. Comprehensive analysis of first trimester human placenta cell lineages with single cell sequencing
Frances Wong and Brian Cox

P60-R. Seasonality and the Immune System during Pregnancy: Implications Child Neurodevelopment and Women with Seasonal Affective Disorder
Cindy Xin Wen Zhang, Robert Levitan, Stephen Matthews



ORAL SESSION 2
3:20pm – 4:20pm
Ben Sadowski Auditorium

O5-B. Towards a cellular-based understanding of theta/gamma rhythms and their cross-frequency coupling in the hippocampus

Alexandra Chatzikalymniou, Frances K. Skinner

O6-C. A Novel Combination Therapy Using First Trimester Perivascular Cells and Endothelial Progenitor Cells Significantly Improves Cardiac Recovery Following Myocardial Infarction

Farwah Iqbal, Alexander Johnston, Poonam Mander, Brandon Wyse, Jun Wu, Ren-Ke Li, Peter Szaraz, Clifford L. Librach

O7-E. Liver-specific p38 MAPK stimulates hepatic fat accumulation and reduces insulin sensitivity in vivo

Sydney L Rivers, HuiQi Wang, Loretta Lam, Adria Giacca

O8-R. Poor preimplantation embryo development potential of coQ-deficient mice is improved with supplements of PQQ

Kyunga Kim, Andrea Jurisicova



ORAL SESSION 3
4:30pm – 5:30pm
Ben Sadowski Auditorium

O9-B. A Pair of Descending Interneurons Control the Motor State Activity

Jun Meng, Wesley Hung, Sonia Mouridi, Marine Mercier, Lili Chen, Xinran Liu, Thomas Boulin, Shangbang Gao, Mei Zhen

O10-E. The regulation of circadian glucagon-like peptide-1 secretion from the intestinal epithelial L-cell by Munc18-1

Jhenielle Campbell, Alexandre Martchenko, Maegan Sweeney, Patricia Brubaker

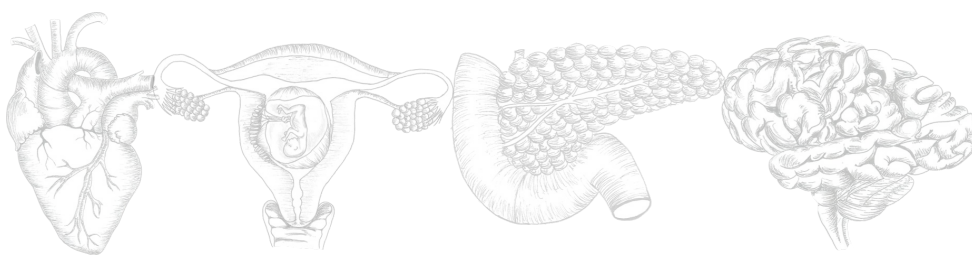
O11-E. RIPK2 inhibitor, GSK583, has protective effects against NOD1-mediated FFA-induced insulin resistance in vivo

Falak Shoaib, Sydney Rivers, Yao Fang Tan, Yusaku Mori, Adria Giacca

O12-R. The adult digit tip regenerative blastema acquires a developing limb mesenchymal precursor like phenotype during regeneration

Neemat Mahmud, Mekayla A. Storer, Dina Karamboulas, Michael J. Borrett, Scott A. Yuzwa, David R. Kaplan, Freda D. Miller





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thanks to:



Cover Illustration: Ms.
Isabelle Fraser



Back cover

CONFERENCE MAP

Mount Sinai Hospital

