

Collaborative Program in Neuroscience (CPIN)

University of Toronto

Newsletter – Vol. 32, No. 6 – February 2016

Featured In This Issue

Announcement The **2016 Collaborative Program In Neuroscience (CPIN) Research Day** will be held on **Thursday, May 19, 2016 at the Medical Sciences Building at the University of Toronto**. Further event details will be forthcoming on the CPIN website: http://www.neuroscience.utoronto.ca/events/CPIN_Research_Day.htm

2016 Toronto Brain Bee The **18th Annual Toronto Brain Bee** that will be held on **Friday, April 1, 2016** at the University of Toronto. For further details and to volunteer at the event, please visit: <http://www.neuroscience.utoronto.ca/events/brainbee.htm>

News – CPIN Faculty Members Congratulations to CPIN member **Dr. Kang Lee** (University Distinguished Professor, APHD, OISE) for recently speaking about his research at the TED2016 event in Vancouver. We would like to welcome **Dr. Steven Miller** (Professor, Paediatrics & IMS) as a new faculty member to the CPIN community. Congratulations to **Dr. Janice Robertson** (Associate Professor, LMP; Tanz Centre for Research in Neurodegenerative Diseases) on the recent publication from her laboratory in the January issue of the journal *Brain*. Congratulations to **Dr. James Rutka** (Professor & Chair, Surgery) on being recently reappointed as Chair of the Department of Surgery at U of T for a second five-year term, beginning April 1, 2016. Please see page 2 & 3 for details.

News – CPIN Trainees Congratulations to CPIN PhD student member **Laura MacNair** (LMP, Supervisor Dr. Janice Robertson) on her recent publication that was featured as the Editor's Choice in the January issue of the journal *Brain*. Congratulations to CPIN student member **Timothy Zeyl** (IBBME; Supervisor Dr. Tom Chau) on recently completing the CPIN requirements and graduating from his PhD program. Please see page 4 for details.

CPIN NeuroCentricArts Competition CPIN is organizing a free-form art competition that is open to everyone. Please see page 5 for details.

Suggested Reading Congratulations to CPIN member **Dr. Elise Stanley** (Senior Scientist, The Krembil Institute, University Health Network; Professor, Physiology) on her recent review article publication in the journal *Trends In Neurosciences*. Please see page 6 for details.

2015-16 CPIN Distinguished Lectureship Series

<http://www.neuroscience.utoronto.ca/events/lectureship.htm>



Speaker | **Dr. Michael Thaut**, Professor, Director of the Music and Health Research Collaboratory (MaHRC), Faculty of Music, U of T
Title | *Music and the Brain: From Neuroscience to Clinical Translations*
Date and Time | **Tuesday, February 23, 2016, 1:00pm**
Location | Walter Hall, Faculty of Music, Edward Johnson Building, 80 Queens Park, U of T
Host | Dr. Lee Bartel, Professor, Associate Director of MaHRC, Director of the Canadian Music Education Research Centre (CMERC), Faculty of Music, U of T
Co-sponsor | Faculty of Music, U of T



Speaker | **Dr. Tim Bussey**, Western Research Chair, Molecular Medicine Research Group, Robarts Research Institute & Dept. of Physiology and Pharmacology, Schulich School of Medicine & Dentistry, Western University, London, ON, Canada; The Brain and Mind Institute, Western University, London, ON, Canada; Professor of Behavioural Neuroscience, Dept. of Psychology, University of Cambridge UK
Title | *Strategies for cognitive translation from animals to humans: neurogenesis, neurodegenerative and neuropsychiatric disease*
Date and Time | **Wednesday, March 30, 2016, 11:00am**
Location | Rm. 2172, Medical Sciences Building, 1 King's College Circle, U of T
Host | Dr. Graham Collingridge, Chair and Professor, Department of Physiology, U of T
Co-sponsor | Department of Physiology, U of T

CPIN Newsletter

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Lead Faculty
Faculty of Medicine

CPIN Participating Units
Applied Psychology & Human Development
Biochemistry
Biomaterials & Biomedical Engineering
Cell & Systems Biology
Computer Science
Dentistry
Laboratory Medicine & Pathobiology
Medical Biophysics
Medical Science
Music
Pharmaceutical Sciences
Pharmacology & Toxicology
Physiology
Psychology
Rehabilitation Science

Contributors:

Human Biology Program
Krembil Research Institute
St. Michael's Neuroscience Research Program

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2015-16 CPIN Distinguished Lectureship Series (contd.)

<http://www.neuroscience.utoronto.ca/events/lectureship.htm>



Speaker | **Dr. Clifford B. Saper**, James Jackson Putnam Professor of Neurology and Neuroscience, Harvard Medical School; Chairman, Department of Neurology, Beth Israel Deaconess Medical Center

Title | *Genetic manipulations of hypothalamic circuitry for regulation of sleep*

Date and Time | **Friday, April 15, 2016, 2:00pm**

Location | 103 Main Lecture Room, FitzGerald Building, 150 College Street, U of T

Hosts | (i) Dr. John Peever, Professor, Departments of Cell & Systems Biology and Physiology, Director, Centre for Brain Sciences, Vice-President, Canadian Sleep Society; (ii) Dr. Richard Horner, Professor, Departments of Medicine and Physiology, Canada Research Chair in Sleep and Respiratory Neurobiology, Director, *Sleep and Biological Rhythms Toronto*

Sponsor | CIHR Team Research and Training Program: *Sleep & Biological Rhythms Toronto*

News - CPIN Faculty Members

http://www.neuroscience.utoronto.ca/communications/news_cpिन_faculty_members.htm



Congratulations to CPIN member **Dr. Kang Lee** (University Distinguished Professor, Applied Psychology and Human Development, OISE) for recently speaking about his research at the TED2016 event in Vancouver.

Link: <https://conferences.ted.com/TED2016/program/speakers.php>

Dr. Kang Lee is a Tier 1 Canada Research Chair at the University of Toronto and a Researcher (Professor Rank) at the Center for Human Development and Department of Psychology, University of California, San Diego. He is a fellow of the Association for Psychological Science. Dr. Lee served for two years as an elected Council Member of the American Psychological Association, and two years as the scientific director of the Board of Directors of the Canadian Psychological Association. Further, he served for ten years as an associate editor of *Developmental Science*, a leading international journal in the field of developmental psychology. Dr. Lee uses behavioral and neuroimaging methods to study the development of verbal deception and that of face processing with more than 200 peer-reviewed publications in such journals as *Psychological Science*. He is a PI of grants from NIH, NSF and the Canadian Foundation for Innovation. His work has led to a new law in Canada in 2006 that determines how child witnesses are admitted into the criminal court to testify.



We would like to welcome **Dr. Steven Miller** (Professor, Department of Paediatrics and Institute of Medical Science) as a new faculty member to the CPIN community.

Dr. Miller is also the Head of the Division of Neurology and the Centre for Brain & Mental Health at the Hospital for Sick Children and Senior Scientist in the Neuroscience & Mental Health Program at the Research Institute of SickKids. He holds the Bloorview Children's Hospital Foundation Chair in Paediatric Neuroscience, and was previously a Canada Research Chair in Neonatal Neuroscience.

Leading a multidisciplinary team, his research program focuses on better understanding brain injury and development in the newborn. He and his team use advanced brain imaging and detailed long-term follow-up to help children who were born early or with conditions that put them at risk of neurological and developmental deficits. He has contributed to our understanding of brain abnormalities caused directly by premature birth, perinatal asphyxia or indirectly by congenital heart disease. The ultimate goal of his team's work is to promote strategies to prevent brain injury, and to promote recovery if the brain is injured to improve the lifelong health of children and their families. He is passionate about supporting the career development of young child health researchers and recently completed his tenure as President of the Society for Pediatric Research.

News - CPIN Faculty Members (contd.)

http://www.neuroscience.utoronto.ca/communications/news_cpिन_faculty_members.htm



Congratulations to CPIN faculty member **Dr. Janice Robertson** (Associate Professor, Department of Laboratory Medicine and Pathobiology; Tanz Centre for Research in Neurodegenerative Diseases) on the recent publication from her laboratory entitled "*MTHFSD and DDX58 are novel RNA-binding proteins abnormally regulated in amyotrophic lateral sclerosis*" that was featured as the Editor's Choice in the January issue of the journal *Brain*.

The first author of the publication is CPIN PhD student Laura MacNair (Laboratory Medicine and Pathobiology, Robertson lab).

Citation: <http://brain.oxfordjournals.org/content/139/1/86.long>

Dr. Robertson received her Ph.D. studying cytoskeletal abnormalities in Alzheimer's disease at the Institute of Psychiatry (IoP), Kings College London. She undertook her postdoctoral training to study the molecular mechanisms causing Amyotrophic Lateral Sclerosis (ALS) firstly as a Wellcome Trust Neurotoxicology Training Fellow at the IoP, then as a Wellcome Trust Prize Travelling Fellow at McGill University.

She then obtained ALS training fellowships from the UK Motor Neurone Disease Association and American ALS Association before taking up her appointment at the University of Toronto where she obtained an Early Researcher Award and Canada Research Chair Tier 2. Dr. Robertson has made significant contributions to the understanding of the pathomechanisms causing ALS, identifying and developing therapeutic strategies targeting misfolded superoxide dismutase-1 (SOD1) and was one of the first teams to show abnormalities of RNA metabolism in disease affected neurons. Dr. Robertson's ongoing research focuses on the genetic causes of the disease, in particular mutations in SOD1, TDP-43 and C9orf72, using multidisciplinary approaches including in vitro and in vivo modeling, neuronal specific transcriptional/translational profiling and biomarker analysis of clinical samples.



Congratulations to **Dr. James Rutka** (Professor & Chair, Surgery) on being recently reappointed as Chair of the Department of Surgery at U of T for a second five-year term, beginning April 1, 2016.

Born in Toronto, and educated at Princeton University (1975-1977), and Queen's University Medical School (1977-1981), Dr. Rutka did an internship at McGill University (1981-1982) before entering the U of T Neurosurgery Training Program in 1982. His training included a research fellowship at the Brain Tumor Research Centre, the University of California San Francisco where he obtained his PhD in Experimental Pathology (1984-1987). Dr. Rutka did a clinical fellowship in microvascular neurosurgery

with Dr. Kenichiro Sugita at the University of Nagoya, and a post-doctoral research fellowship in molecular immunology at Juntendo University, Tokyo (1990).

Dr. Rutka assumed his appointment in the Department of Surgery, Division of Neurosurgery in 1990, and has been on the surgical staff at the Hospital for Sick Children in the Division of Pediatric Neurosurgery since that time. Dr. Rutka's primary research and clinical interests relate to the science and surgery of human brain tumors. His recent clinical interests have centred on the surgical treatment of epilepsy in children. He has over 400 peer reviewed publications. In 1999, Dr. Rutka was promoted to Professor in the Department of Surgery, and was appointed Chairman of the Division of Neurosurgery at U of T. In 2011, he became a Fellow of the Royal Society of Canada, and the Canadian Academy of Health Sciences. In 2013, Dr Rutka was inducted as a Member of the Order of Ontario, and became the first Canadian to be appointed as Editor-in-Chief of the *Journal of Neurosurgery*. In 2015, he received the Robert L. Noble Award from the Canadian Cancer Society, the Margolese National Brain Disorders Prize from the University of British Columbia, and became an Officer of the Order of Canada.

News - CPIN Trainees

http://www.neuroscience.utoronto.ca/communications/news_cpिन_students.htm



Congratulations to CPIN PhD student member **Laura MacNair** (Laboratory Medicine and Pathobiology, Robertson lab) on her recent publication entitled “*MTHFSD and DDX58 are novel RNA-binding proteins abnormally regulated in amyotrophic lateral sclerosis*” that was featured as the Editor’s Choice in the January issue of the journal *Brain*.

The senior author of the publication is Dr. Janice Robertson (Associate Professor, Department of Laboratory Medicine and Pathobiology; Tanz Centre for Research in Neurodegenerative Diseases).

Citation: <http://brain.oxfordjournals.org/content/139/1/86.long>

Laura used a technique called Translating Ribosome Affinity Purification (TRAP) coupled with microarray analysis to identify changes in mRNAs actively being translated in motor neurons in a mouse model of ALS. This analysis identified two novel RNA-binding proteins that were abnormally regulated in spinal cord motor neurons in ALS cases. Laura has also received several scholarships and awards including the Theodore I. Sherman Award in Neuroscience, CRND Graduate student Aid Endowment, School of Graduate Studies Conferences Grant, 1st place for a scientific poster at the 24th International Symposium on ALS/MND, and a Bowringer Ingelheim sponsored 1st place award for ‘Creating Life Sciences Products (BTC1850H)’ to initiate funding of a group business proposal. Laura thanks all members of the Robertson Lab, the Tanz Centre for Research in Neurodegenerative Diseases, the CPIN program and the department of Laboratory Medicine and Pathobiology for supporting her research.

Select publications:

MacNair L., Xiao S., Miletic D., Ghani M., Julien J.P., Keith J., Zinman L., Rogaeva E., Robertson J. (2015). MTHFSD and DDX58 are novel RNA-binding proteins abnormally regulated in amyotrophic lateral sclerosis. *Brain*. 139(1): 86-100. doi: 10.1093/brain/aww308

Xiao S., **MacNair L.**, McGoldrick P., McKeever P., McLean J.R., Zhang M., Keith J., Zinman L., Rogaeva E., Robertson J. (2015). Isoform specific antibodies reveal distinct subcellular localizations of C9orf72 in amyotrophic lateral sclerosis. *Ann. Neurol*, 78(4): 568-583. doi: 10.1002/ana.24469.



Congratulations to CPIN student member **Timothy Zeyl** (Institute of Biomaterials and Biomedical Engineering; Supervisor Dr. Tom Chau) on recently completing the CPIN requirements and graduating from his PhD program.

Tim’s research on applied neuroimaging was conducted at the Holland Bloorview Kids Rehabilitation Hospital. Tim’s focus was on developing brain-computer interfaces based on electroencephalography for eventual use as communication devices for people with severe motor impairments, or who are locked-in. Specifically, he used signal processing and machine learning techniques to detect error-related potentials that were evoked in response to brain-computer interface mistakes. He showed that these signals were useful for optimizing brain-computer interface performance throughout time and automatically correcting mistakes as they occurred. Throughout his PhD, Tim contributed to six accepted journal articles, three as first author, with a fourth that is under consideration. Tim won several competitive scholarships including the Ontario Graduate Scholarship, the NSERC CREATE CARE scholarship, and the Holland Bloorview Foundation Graduate Student Award. Following his PhD, Tim is pursuing biomedical data analysis opportunities and plans to participate in the development of wearable- and neuro-technologies.

Select Publications:

Zeyl T, Yin Y, Keightley M, Chau T. Adding real-time Bayesian ranks to error-related potential scores improves error detection and auto-correction in a P300 speller. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, In Press. doi:10.1109/TNSRE.2015.2461495

Zeyl TJ, Chau T. A case study of linear classifiers adapted using imperfect labels derived from human event-related potentials. *Pattern Recognition Letters* 2014;37(0):54–62. doi:10.1016/j.patrec.2013.05.020

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2015-16 CPIN Neurotalk

<https://www.facebook.com/groups/CPINneurotalk/>

<http://www.neuroscience.utoronto.ca/events/Neurotalk.htm>

CPIN Neurotalk 18: The Neuroscience of Creativity

****NOTE: LOCATION STILL AT GRAD ROOM FOR THIS MONTH ** - Grad Room, northeast corner of Spadina & Harbord, in the Second Cup, downstairs.**

Date & time: Friday, Feb. 26 at 4:00pm

Moderated by: Tsukiko Miyata, Dept. of Medical Biophysics

Our everyday life is surrounded by creativity. We go to an art gallery, and harmonies of colours melt our heart. We go to a concert and let our body move to our favourite music. We go to a movie and chew over the quality of the story and effects. Scientists let their imaginations drive their research toward groundbreaking discoveries and inventions.

Creativity is one of the few unique traits us human beings have acquired to embellish our lives. What triggers us to appreciate innovative and/or aesthetic experiences? Is artistry a faculty anyone can achieve? What sparks creative thinking?

This month, we are going to explore these questions with help of current knowledge in Neuroscience. Let's rack our brains about why our brain is hungry for creativity!

Collaborative Program in Neuroscience (CPIN) Neurotalk presents
Neurotalk 18

The Neuroscience of Creativity

Moderated by Tsukiko Miyata
Department of Medical Biophysics
University of Toronto



**4 PM, February 26th
Grad Room
(Second Cup, downstairs)
66 Harbord St, Toronto ON
M5S 1G2**

This month we will explore the following topics with the help of current research in neuroscience:

¹ The neuroscience of music, creativity, and art.

² Do musicians and artists have different brain connectivity patterns compared to the general population?

³ What has research in neuroscience revealed about the perception of beauty in art?

for more information visit
[facebook.com/groups/CPINneurotalk](https://www.facebook.com/groups/CPINneurotalk)
[neuroscience.utoronto.ca/events/Neurotalk](http://www.neuroscience.utoronto.ca/events/Neurotalk)

CPIN NeuroCentricArts Competition

<http://www.neuroscience.utoronto.ca/events/neurocentricarts.htm>

UNIVERSITY OF TORONTO | Collaborative Program In Neuroscience (CPIN)
Proudly Presents

NEUROCENTRICARTS COMPETITION
University of Toronto
April 29, 2016

A free-form art competition open to everyone

Please visit the CPIN website for details:
<http://www.neuroscience.utoronto.ca/>

Open Call: CPIN is organizing a free-form art competition that is open to everyone (both neuroscientists or non-neuroscientist artists of every level). Prizes will be awarded to the best submissions.

The Cause: All proceeds from the event will be used to fund CPIN educational activities and outreach programs. Donations boxes and informational pamphlets will be present at the event.

Event Location and Time: University of Toronto, April 29, 2016

Eligible submissions:

* Original art work related/influenced by the brain and neuroscience including (but not limited to) paintings, sketches, original computer generated images or illustrations, original computer animations, sculptures or other 3D constructions, jewelry, knitting work, modified (sterile) laboratory utensils, photography, short films etc.

Submission information:

* Submissions do not have to be scientifically accurate; * All submissions will go through a pre-submission approval process (free of charge) and participants with accepted entries will be notified; * Only accepted submissions for the event will have to pay an entry fee of \$20.; * Accepted entries will be on display at the event; * Only one entry per person accepted.

Artist Registration and Entry Pre-submission: To provide information on your proposed entry and register for the event, please fill [the online participant pre-submission form](#) by **Friday, March 11, 2016**.

Visitor Registration: To attend the event without submitting an entry, please complete [the online visitor registration form](#) by **Friday, April 8, 2016** to ensure free Early-Bird registration.

Please contact the CPIN Office (p.neuroscience@utoronto.ca) if you have any questions. Please feel free to distribute the event information as you deem suitable. We look forward to your participation and submission!

<http://www.neuroscience.utoronto.ca/communications/newsletter.htm>

Collaborative Program in Neuroscience (CPIN) University of Toronto

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Suggested Reading

Congratulations to CPIN member **Dr. Elise Stanley** (Senior Scientist, The Krembil Institute, University Health Network; Professor, Department of Physiology) on her recent review article publication in the journal *Trends In Neurosciences* entitled “*The Nanophysiology of Fast Transmitter Release*”.

Link to the review article : <http://www.cell.com/trends/neurosciences/fulltext/S0166-2236%2816%2900017-5>

Review Article Abstract:

Action potentials invading the presynaptic terminal trigger discharge of docked synaptic vesicles (SVs) by opening voltage-dependent calcium channels (CaVs) and admitting calcium ions (Ca²⁺), which diffuse to, and activate, SV sensors. At most synapses, SV sensors and CaVs are sufficiently close that release is gated by individual CaV Ca²⁺ nanodomains centered on the channel mouth. Other synapses gate SV release with extensive Ca²⁺ microdomains summed from many, more distant CaVs. We review the experimental preparations, theories, and methods that provided principles of release nanophysiology and highlight expansion of the field into synaptic diversity and modifications of release gating for specific synaptic demands. Specializations in domain gating may adapt the terminal for roles in development, transmission of rapid impulse frequencies, and modulation of synaptic strength.

Upcoming Events

U of T Neuroscience Seminars

<http://neuroscience.utoronto.ca/events/seminar.htm>

Conferences and Meetings

http://neuroscience.utoronto.ca/events/Conf_M.htm

Graduate Student Award Opportunity

The **Weston Brain Institute International Fellowships in Neuroscience** will benefit Canada and Canadians by developing leading neuroscientists and enhancing our international competitiveness in the knowledge economy. The Fellowship will provide an award of \$60,000 for each selected student (prorated as needed) for up to 3 Canadian graduate students from the University of Toronto conducting translational research in neurodegenerative diseases of aging. This award will enable outstanding students to travel to and work in world-renowned labs to further their research. The goal is to build international collaborations, foster influential neuroscience research and bring enhanced research capabilities back to Canada.

For further information, please see the following link:

<http://glse.utoronto.ca/news/2016-17-weston-brain-institute-international-fellowships-neuroscience-deadline-march-1-2016>

Reminders

Call for CPIN 2016-2017 Distinguished Lecturer Nominations CPIN trainee & faculty members are welcome to nominate potential speakers for the 2016-2017 Distinguished Lectureship Series. The nominations will be reviewed by the CPIN Executive Committee for approval. Your participation is important and contributes to the multidisciplinary nature of the lectureship. The online form can be found at the following link:

http://www.neuroscience.utoronto.ca/events/lectureship/distinguished_lecturer_nominations.htm

Submissions for News Updates The CPIN Office requests trainee and faculty members to submit updates in research discoveries, events, and other achievements involving CPIN members. Please send your submissions to p.neuroscience@utoronto.ca

CPIN Student Completion Form CPIN graduate students who have completed both their home department and CPIN trainee requirements must fill in the online completion form located at the link below:

http://www.neuroscience.utoronto.ca/students/cpin_student_completion_form.htm