

# Collaborative Program in Neuroscience (CPIN)

## University of Toronto

Newsletter – Vol. 37, No. 1 – September 2020



Wasp and Goldenrod, Iulia Park

## Featured In This Issue

**News – CPIN Trainees** Congratulations to CPIN student members **Kenya Costa-Dookhan**, **Melisa Gumus**, and CPIN alumna and Postdoctoral Fellow, **Dr. Catharine Mielnik** on their achievements. Please see pages 2 and 3 for details.

**Neuroscience Opportunities** Please see page 3 for details.

**Welcome New CPIN Students** Please see page 4 for details.

**Congratulations CPIN Graduating Students** Please see page 5 for details.

**News – CPIN Faculty** We would like to welcome **Dr. Tony George** as a new faculty member to the CPIN community. We congratulate **Dr. Karen Davis** and **Dr. Walter Swardfager** on their achievements. Please see pages 5 and 6 for details.

## 2020-21 CPIN Distinguished Lectureship Series

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



### CPIN Distinguished Lecture/Physiology Seminar Series

Speaker | **Andrea Fleig**, PhD, MBA / Associate Director of Biomedical Research, The Queen's Medical Center, Honolulu, USA, and Researcher (Professor) University of Hawaii

Title | *Natural Products as Modulators of Calcium Signaling in Inflammation and Neurological Pain*

Date | **Thursday, October 8, 2020, 4:00 PM**

Location | Online; connection details TBA

Host | Dr. Hong-Shuo Sun, Associate Professor, Departments of Surgery, Physiology, and Pharmacology, IMS, and Leslie Dan Faculty of Pharmacy, U of T



### CPIN Distinguished Lecture/ Tator-Turnbull Symposium Keynote

Speaker | **Wolfram Tetzlaff**, MD (Essen), PhD, Professor, Departments of Zoology & Surgery, University of British Columbia

Title | *From Diet to Cells: Preclinical Strategies for Spinal Cord Injury*

Date | **Friday, October 23, 2020, 3:00 PM**

Location | Online; connection details TBA

Host | Dr. Michael Fehlings, Co-Director U of T Spinal Program & Vice Chair Research, Department of Surgery, U of T

Co-Sponsors | Spinal Cord Injury Ontario; Brain Canada Foundation; Ontario Neurotrauma Foundation; Inteligex; Barbara Turnbull Foundation

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

## CPIN Newsletter

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CPIN  
Graduate Studies

Iulia Park  
Administrator  
CPIN Office

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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  
Public Health  
Rehabilitation Science

Contributors:  
Heart & Stroke/Richard  
Lewar Centre of Excellence in  
Cardiovascular Research

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

### News – CPIN Trainees

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[http://www.neuroscience.utoronto.ca/communications/news\\_cpिन\\_students.htm](http://www.neuroscience.utoronto.ca/communications/news_cpिन_students.htm)



Congratulations to CPIN student member **Kenya Costa-Dookhan** (Institute of Medical Science, Dr. Margaret Hahn) on recently completing the CPIN requirements and graduating from her MSc program.

Kenya's primary research with Dr. Hahn explored the interplay between psychotic spectrum disorders, antipsychotic medications, and cardiovascular disease risk. Her thesis project investigated the role of the gut microbiome in metabolic and cognitive dysfunction in antipsychotic naive patients with DSM-5 diagnoses of mood or psychosis disorders. In addition to her MSc work, she has also explored bariatric surgery and psychosocial care with Drs. Sanjeev Sockalingam and Stephanie Cassin.

During her MSc, Kenya was the recipient of federal (CIHR CGS-M), provincial (Ontario Graduate Scholarship), and local (Banting and Best Novo Nordisk Graduate Studentship, CAMH Discovery Fund, Cleghorn fellowship) awards.

She has authored 7 peer-reviewed publications, 3 of which she is the first author on. Her work has been presented at international and national conferences in schizophrenia, biological psychiatry, and bariatric surgery.

Outside of her studies, Kenya was a CPIN mentor, involved in the IMS magazine as a journalist and writer, and fundraised for charities supporting mental health organizations through local runs and cycling events.

She is currently a first-year medical student at the University of Toronto.

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Congratulations to CPIN student member **Melisa Gumus** (Institute of Medical Science, Dr. Maria Carmela Tartaglia) on recently completing the CPIN requirements and graduating from her MSc program.

Melisa's MSc thesis combined computational neuroscience and neurodegenerative research. Post-concussion syndrome (PCS) is having persistent symptoms following a concussion, yet, there is no diagnostic biomarker for this condition. Melisa developed a machine learning pipeline that predicted neuropsychiatric and symptom reports of patients based on their individual structural (DWI) and functional (resting-state-fMRI) connectivity. She identified 2 PCS subtypes; a mild group with similar connectivity and behavioural profiles as healthy controls, and a severe group that showed great deviations from mild patients. Her work provided a novel technique that can help neuroscientists understand heterogeneity in many neurodegenerative diseases.

Melisa received Ontario Graduate Scholarship and Canadian Traumatic Brain Injury Research Consortium Training Grant. She presented at national and international conferences and authored 4 publications during her MSc, 3 of which she is the first author while 2 additional first-author publications are in preparation.

Besides her studies, Melisa worked as a teaching assistant in Medical Science and Human Biology and as a mentor on different initiatives including the Summer Mentorship Program, the Faculty of Medicine and the Foundation for Student Science and Technology Research Co-op Program.

She hopes to continue with a doctoral training and pursue a career in research and teaching in academia.

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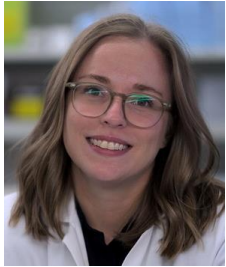
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### News – CPIN Trainees

[http://www.neuroscience.utoronto.ca/communications/news\\_cpिन\\_students.htm](http://www.neuroscience.utoronto.ca/communications/news_cpिन_students.htm)



Congratulations to CPIN alumna and Postdoctoral Fellow **Dr. Catharine Mielnik** from the lab of Dr. Amy Ramsey in the Department of Pharmacology & Toxicology on her recent publication in *Molecular Psychiatry*.

The study, authored by several CPIN members and students and entitled “Consequences of NMDA Receptor Deficiency Can be Rescued in the Adult Brain”, was published in *Molecular Psychiatry* on August 17, 2020. This study was the culmination of Dr. Catharine Mielnik’s doctoral dissertation in Dr. Amy Ramsey’s laboratory; from generation of the novel mouse model to the characterization of its rescue. It was a large collaborative study that included other CPIN members (Drs. Evelyn Lambe, Ali Salahpour, and Ruth Ross) and students (Mary Binko, Yuxiao Chen, Katheron Intson, and Rehnuma Islam).

The study addressed a critical question in the treatment of neurodevelopmental disorders: when is the best time to treat these types of disorders? Following the development of a novel mouse model, and assessing multiple developmental ages for intervention, they found that Cre-mediated reversal of gene knockdown led to robust molecular, biochemical and behavioural improvements. Excitingly, genetic rescue in adult mice was as effective at improving cognition as interventions in juvenile and adolescent mice. This finding provides evidence that adult interventions for neurodevelopmental disorders like autism and schizophrenia can be effective, even for cognitive deficiencies that are historically treatment-resistant. The implications of this work are long-ranging: what was originally believed to be a rigid and static adult brain is actually quite plastic and responsive to change.

The publication is available here:

<https://doi.org/10.1038/s41380-020-00859-4>

Catharine Mielnik is currently a Postdoctoral Fellow at the University of Toronto in the Department of Pharmacology & Toxicology, with CPIN member Dr. Ruth Ross. Her Postdoctoral work has focused on pre-clinical validation of cannabinoid-targeting pharmacological compounds in models of neuropsychiatric disorders. With the recent legalization of cannabis in Canada, the implication of this work is broad: from what do constituents of cannabis do to the brain, to novel drug discovery in targeting the cannabinoid system in disease states. This work has garnered attention at local and international conferences, winning the International Cannabinoid Research Society Presentation Award, and also an Excellence in Poster Presentation Award through CPIN. This work has also led to a patent for a novel allosteric modulator of Cannabinoid Receptor 1 (CB1), resulted in a first-author paper in *Neuropsychopharmacology*, and sparked numerous local and international collaborations for the newly developed research program.

### Neuroscience Opportunities

[http://www.neuroscience.utoronto.ca/communications/Positions\\_Available.htm](http://www.neuroscience.utoronto.ca/communications/Positions_Available.htm)

#### Scientist, Psychiatry Winterlight Labs

**Description:** Winterlight is currently seeking a research scientist to oversee our internal and external research projects in psychiatry, including our work in depression and schizophrenia.

[Click here for position and application details.](#)

# Collaborative Program in Neuroscience (CPIN)

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### Welcome New CPIN Students

<http://www.neuroscience.utoronto.ca/students/currentstudents.htm>

CPIN extends a warm welcome to the following new CPIN Trainees:

Last Name	First Name	Home Unit	Degree	Supervisor
Bao	Wenfu	REHSC	PhD	Dr. Monika Molnar
Borges	Jazlyn	PSL	MSc	Dr. Benjamin Steinberg
Brockie	Sydney	IMS	MSc	Dr. Michael Fehlings
Choi	Sun Eui	MBP	MSc	Dr. Brian Nieman
Chu	Annie	MUS	MA	Dr. Michael Thaut
Cole	Lauren	MUS	PhD	Dr. Michael Thaut
Dingwell	Dylan	MBP	PhD	Dr. Charles Cunningham
Gugustea	Radu	PSL	PhD	Dr. Zhengping Jia
Hong	Yoo Kyung (Cindy)	CSB	MSc	Dr. Junchul Kim
Hoorn	Annie Annelies	PSL	PhD	Dr. Sheena Josselyn
Huang	Leo	PSY	MA	Dr. Randy McIntosh
Hyde	Molly	IMS	PhD	Dr. Sakina Rizvi and Dr. Sidney Kennedy
Kates	Jeffrey	CSB	MSc	Dr. Rutsuko Ito
Khellaf	Abdelhakim	IMS	MSc	Dr. Michael Cusimano
Kim	Ain	LMP	MSc	Dr. Gabor Kovacs
Kim	Kyungwook (Gerard)	CSB	MSc	Dr. John Peever
Lee	Jiwon	IMS	MSc	Dr. Margaret Hahn
Phung	Thanh	CSB	PhD	Dr. Ashley Monks
Poorganji	Mohsen	IMS	MSc	Dr. Jeff Daskalakis and Dr. Daniel Blumberger
Reda	Anas	CSB	MSc	Dr. Iva Zovkic
Rosanally	Sana	PSL	MSc	Dr. Etay Hay
Sadek	Marawan	IMS	MSc	Dr. Aylin Reid
Sanmuganathan	Vaidhehi	IMS	MSc	Dr. Karen Davis
Santos	Alexandra	BME	MASc	Dr. Peter Carlen
Smith	Emily	IMS	MSc	Dr. Margaret Hahn
Sujanthan	Sajeevan	IMS	MSc	Dr. Richard Swartz
Tan	Melissa	MUS	PhD	Dr. Michael Thaut
Teich	Jessica	MUS	PhD	Dr. Michael Thaut
Tsai	Pascale	IMS	MSc	Dr. Mojgan Hodaie
Uthayakumar	Biranavan	MBP	MSc	Dr. Charles Cunningham
Walker	Madison	IMS	MSc	Dr. Michael Cusimano
Yao	Heng Kang	PSL	MSc	Dr. Etay Hay

Students interested in applying to CPIN are encouraged to apply within a month of starting their degree.

The application form is available here:

[http://www.neuroscience.utoronto.ca/students/cpin\\_student\\_application\\_form.htm](http://www.neuroscience.utoronto.ca/students/cpin_student_application_form.htm)

The requirements and expectations for the program are available here:

<http://www.neuroscience.utoronto.ca/CSIN/requirements2010.htm>

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### Congratulations CPIN Graduating Students

<http://www.neuroscience.utoronto.ca/students/currentstudents.htm>



**Analyssa Cardenas**  
Program: MSc  
Rehabilitation  
Sciences  
Supervisor:  
Dr. Darcy Fehlings

**Thesis Title:** Inpatient Rehabilitation Exergames for Children with Cerebral Palsy following Lower Extremity Orthopaedic Surgery



**Shiron Lee**  
Program: MSc  
Pharmaceutical  
Sciences  
Supervisor:  
Dr. David Hampson

**Thesis Title:** Delivery of Sodium Channel Subunits via Viral Vectors to Ameliorate Seizures in Dravet Syndrome Mice



**Susan Zhou**  
Program: MSc  
Physiology  
Supervisor: Dr.  
Zhengping Jia

**Thesis Title:** The Role of PAK Signaling in Social Memory

Last Name	First Name	Home Unit	Degree	Supervisor
Ahmed	Mashal	IMS	MSc	Dr. Isabelle Boileau and Dr. Stefan Kloiber
Alemu	Robel	IMS	MSc	Dr. Karen Gordon
Al-Ozzi	Tameem	PSL	MSc	Dr. William D. Hutchison
Atwi	Sarah	MBP	PhD	Dr. Bradley MacIntosh
Gaudette	Erin	IMS	MSc	Dr. Isabelle Boileau
Szigeti	Zara	REHSC	MSc	Dr. Emily Nalder
Truong	Jennifer	IMS	MSc	Dr. Isabelle Boileau and Dr. Stephen Kish

### News – CPIN Faculty Members

[http://www.neuroscience.utoronto.ca/communications/news\\_cpिन\\_faculty\\_members.htm](http://www.neuroscience.utoronto.ca/communications/news_cpिन_faculty_members.htm)



Congratulations to CPIN Faculty member **Dr. Karen Davis** for her election into The Royal Society of Canada (RSC). Dr. Davis is one of eighty-seven new Fellows in the Academies of Arts and Humanities, Social Sciences, and Science who have been elected by their peers for their outstanding scholarly, scientific and artistic achievement. Recognition by the RSC is the highest honour an individual can achieve in the Arts, Social Sciences and Sciences.

Dr. Karen Davis is internationally recognized for her pioneering and influential neuroscientific research using electrophysiology, psychophysics, and brain imaging approaches that has improved our understanding of the mechanisms that underlie pain and its modulation. Through mentorships and leadership roles, and as president of the Canadian Pain Society she has advanced the pain and

neuroscience fields and advocated for strategies and neuroethics policies that impact people who are living with chronic pain.

Dr. Davis' lab investigates the brain mechanisms underlying chronic pain, pain-attention interactions, how the brain responds to traumatic injuries, plasticity associated with treatment and recovery, and the individual factors that contribute to disease vulnerability and recovery. Dr. Davis has given over 200 invited lectures and published over 200 papers and book chapters. She is currently a Full Professor in the Department of Surgery and the Institute of Medical Science at the University of Toronto, and is Heads of the Division of Brain, Imaging and Behaviour at the Krembil Brain Institute of the University Health Network. Dr. Davis sits on the CIHR Advisory Board for the Institute of Neuroscience, Mental Health and Addiction, the Scientific Advisory Council of Brain Canada, and is the current President of the Canadian Pain Society. Dr. Davis was inducted into the Johns Hopkins Society of Scholars and is a fellow of the Canadian Academy of Health Sciences.

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

## News – CPIN Faculty Members

[http://www.neuroscience.utoronto.ca/communications/news\\_cpín\\_faculty\\_members.htm](http://www.neuroscience.utoronto.ca/communications/news_cpín_faculty_members.htm)



We would like to welcome **Dr. Tony George** (Professor, Department of Psychiatry, Institute of Medical Science, University of Toronto; Clinician Scientist and Head, Biobehavioural Addictions and Concurrent Disorders Research Laboratory, Campbell Family Mental Health Research Institute, CAMH ) as a new faculty member to the CPIN community.

Dr. Tony George has over 220 peer-reviewed publications, book chapters and other reports, and is a Fellow of the American College of Neuropsychopharmacology (ACNP). He is Deputy Editor of ACNP's journal *Neuropsychopharmacology*, and contributed the chapter on Nicotine and Tobacco to Cecil Textbook of Medicine in the 2011 and 2015 editions. He is a member of the Scientific Advisory Council of the Canadian Council on Substance Abuse (CCSA), co-editing its report on

Cannabis and Youth in 2015.

Dr. George completed his undergraduate and medical school training at Dalhousie University in Halifax, Nova Scotia, graduating with his MD degree in 1992, and then completed psychiatry residency training (1992-96) and a fellowship in translational neuroscience (1996-98) at the Yale University School of Medicine in New Haven, Connecticut.

From 2008 to 2012, he was Clinical Director of the CAMH Schizophrenia Program, and from 2012 to 2016, he was Chief of the Schizophrenia Division and Medical Director of the Complex Mental Illness Program at CAMH. He was also the inaugural holder of the Chair in Addiction Psychiatry at the University of Toronto from 2006 to 2012, and Co-Director of the Division of Brain & Therapeutics from 2012-2018. From 2016 to 2018, he was also Chief of the CAMH Addictions Division.

Dr. George directs a program of research focused on understanding the biological basis of addiction comorbidity in serious mental illness, with a focus on tobacco and cannabis use in schizophrenia. His research is supported by the Canadian Institutes of Health Research (CIHR), the National Institutes of Health (NIH) and Canada Foundation for Innovation (CFI).



Congratulations to CPIN Faculty member **Dr. Walter Swardfager** (Assistant Professor, Department of Pharmacology & Toxicology, University of Toronto; Scientist, Evaluative Clinical Sciences, Sunnybrook Research Institute) on his team's study which shows that a common diabetes medication may have the potential to slow memory loss in patients with Alzheimer's disease.

The findings suggest that metformin was associated with improved memory performance among 1192 cognitively normal people with type 2 diabetes, but that the dipeptidyl peptidase-4 (DPP4) inhibitors were associated with a slower rate of memory decline among 807 people with Alzheimer's disease. The study further suggested that the ApoE epsilon 4 allele, the strongest known genetic risk factor for Alzheimer's disease, may moderate some drug effects on memory decline.

The findings were presented at the Alzheimer's Association International Conference by lead author Che-Yuan (Joey) Wu, a graduate student in the Swardfager lab, and published in *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*.

<https://alz-journals.onlinelibrary.wiley.com/doi/full/10.1002/alz.12161>

Dr. Swardfager is the Principal Investigator of the Sunnybrook Type 2 Diabetes Study (S2DS), which aims to understand relationships between neuroendocrine changes, mood, and cognitive complications in people with type 2 diabetes, an increasingly prevalent risk factor for stroke, Alzheimer's disease and vascular dementia. The lab's interdisciplinary clinical research group uses fluid biomarkers, genomics, neuroimaging, and cognitive assessments to elucidate mechanisms underlying brain aging and neurodegeneration. The lab's pharmacoepidemiology group aims to understand how individual patient factors and medications used to control vascular and metabolic risk factors moderate dementia risk.