

# Collaborative Program in Neuroscience (CPIN)

## University of Toronto

Newsletter – Vol. 31, No. 6 – February 2015

### Featured In This Issue

**Welcome New CPIN Students** Please see below for details.

**Welcome New CPIN Postdoctoral Fellow** Please see below for details.

**Welcome New CPIN Faculty Members** **Dr. Romina Mizrahi** (Associate Professor, Depts. of Psychiatry, Institute of Medical Science and Pharmacology & Toxicology) and **Dr. Iva Zovkic** (Depts. of Psychology, Cell & Systems Biology). Please see page 3 for more details.

**News – CPIN Faculty Members – Publications** Congratulations to CPIN faculty member **Dr. Min Zhuo** (Professor, Department of Physiology) on the recent publication from his laboratory on the link between anxiety and chronic pain through the delineation of mechanisms in the brain's anterior cingulate cortex (ACC). Please see page 2 for more details.

**News – CPIN Students** Congratulations to CPIN student members **Aaron Kucyi** (Institute of Medical Science) & **Chloe McDonald** (Institute of Medical Science) on recently completing the CPIN requirements and graduating from the program. Please see page 2 & 3 for more details.

**CPIN Neurotalk** The CPIN Graduate Executives will host a Neurotalk on **Thursday, February 26, 2015**. Please see page 4 for details.

### Neuroscience Distinguished Lectureship

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



Speaker | **Dr. Luis de Lecea**, Department of Psychiatry and Behavioral Sciences, Stanford University

Title | *To sleep or not to sleep: optogenetics of arousal*

Date | **Friday, March 6, 2015**

Time | 2:00 pm

Location | 610 Auditorium, Health Sciences Building (155 College St.), University of Toronto

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 & Biological Rhythms Toronto*

Sponsors | (i) Department of Cell and Systems Biology, University of Toronto;

(ii) CIHR Team Research and Training Program: *Sleep & Biological Rhythms Toronto*

**Note: CPIN Trainees should fill the online lecture report form following the lecture**

### Welcome New CPIN Students

Last Name	First Name	Home Unit	Degree	Supervisor
Dragas	Rachel	Institute of Medical Science	MSc	Michael Fehlings
Knezevic	Dunja	Institute of Medical Science	MSc	Romina Mizrahi
Urban	Karolina	Rehabilitation Science	PhD	Michelle Keightley

### Welcome New CPIN Postdoctoral Fellow

Last Name	First Name	Department/Institution	Supervisor
Muesch	Kathrin	Psychology	Christopher Honey

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

### CPIN Newsletter

Zhong-Ping Feng  
Director  
CPIN  
Graduate Studies

Suhail Asrar  
Administrator  
CPIN Office

CPIN Graduate Executives

### CPIN Office

[p.neuroscience@utoronto.ca](mailto:p.neuroscience@utoronto.ca)

Tel.: 416 978 8637

### 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:

St. Michael's Neuroscience  
Research Program

Toronto Western Research  
Institute

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## University of Toronto

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### News - CPIN Faculty Members - Publications

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



Congratulations to CPIN faculty member **Dr. Min Zhuo** (Professor, Department of Physiology) on the recent high profile publication from his laboratory in the journal *Neuron* on the link between anxiety and chronic pain through the delineation of mechanisms in the brain's anterior cingulate cortex (ACC).

**Citation: Koga K, Descalzi G, Chen T, Ko HG, Lu J, Li S, Son J, Kim T, Kwak C, Huganir RL, Zhao MG, Kaang BK, Collingridge GL, Zhuo M. Coexistence of Two Forms of LTP in ACC Provides a Synaptic Mechanism for the Interactions between Anxiety and Chronic Pain. *Neuron*. 2015 Jan 21;85(2):377-89. doi: 10.1016/j.neuron.2014.12.021. Epub 2014 Dec 31.**

Dr. Zhuo is the Michael Smith Chair in Neuroscience and Mental Health, & the Canada Research Chair Tier I in Pain and Cognition. He earned his B.A. degree in Biophysics from University of Science & Technology in China & Ph.D. degree in Pharmacology from University of Iowa under the guidance of Prof. Gerald Gebhart. He received his postdoctoral trainings at Columbia University with Prof. Eric R Kandel & Stanford University with Prof. Richard W. Tsien. He held a faculty position of full professor at Washington University in St. Louis, before he moved to University of Toronto. He helped to establish the center for Pain research in Washington University in St Louis, & acted as chief for basic research.

Dr. Zhuo's research interests are cellular and molecular mechanisms of synaptic plasticity, cortical & spinal neuronal circuits, & implications of these plastic changes in physiological and pathological conditions. They include chronic pain, fear, anxiety, fragile X disease, & mood disorders. He has published more than 200 articles in professional journals such as Nature, Science, Nature Neuroscience, Neuron, Science Translational Medicine, Science Signaling, PNAS, Trends in Neuroscience, & more than 20 review articles. His H-factor is 60. He is the founding editor & editor-in-chief for the online journal of Molecular Pain (IF=3.53), & the founding & executive editor for Molecular Brain (IF=4.35). From 2013, he will also act as Deputy Chief Editor for J Neurochemistry. He is the Editor of the first text book of Molecular Pain. He was Chang Jiang (Li Ka Shing) Scholar in Fudan University, Shanghai (2005-2008) & is currently the WCU\_Seoul National University visiting Professor, Korea. In 2009, he was elected as a Fellow of the Royal Society of Canada. Recently, he has helped to establish the center for Neuron & Brain Disease in Xian Jiao-Tong University in China, & he acts as the director for the center as well as the first director for Frontier life science institute. He is the founder & president of association for Neuron & Brain Disease (or called AND), & has organized annual meetings in promoting the exchanges of novel neurobiological discoveries globally since the year of 2006. In 2014, he was also invited to join the editorial board for Philosophical Transactions of the Royal Society in UK.

### News - CPIN Students

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



Congratulations to CPIN student member **Aaron Kucyi (Institute of Medical Science, Supervisor Dr. Karen Davis)** on recently completing the CPIN requirements and graduating from the program.

Aaron received his PhD from the University of Toronto (11/2014) where he conducted neuroimaging research on pain, attention, and their interactions in the brain. He is now a postdoctoral fellow at Harvard Medical School/Massachusetts General Hospital. Aaron has interests in the role of spontaneous brain activity in consciousness and in brain disorders. As a PhD student, he developed new approaches to study "mind wandering" away from pain and fMRI data analyses of brain network dynamics. He was invited to speak at numerous conferences and presented his work in Italy, Germany, Argentina and several Canadian and

U.S. cities. Aaron received various awards (e.g. CIHR, OGS) and published first-author papers in high-impact journals including PNAS, Trends in Neurosciences, and Journal of Neuroscience.

Aaron is highly engaged in science leadership, outreach and education. He led research committees and initiatives at Toronto Western Research Institute and University of Toronto Centre for the Study of Pain. He spoke publically about neuroscience, served as a teaching assistant, and lectured at public schools. He is an active science communicator on Twitter, with over 4200 followers. Aaron was recently appointed to an international leadership position, Chair of the Organization for Human Brain Mapping Student and Postdoc Group.

#### Select Publications:

**Kucyi, A., Davis, K.D** (2015). The dynamic pain connectome. *Trends in Neurosciences* 38(2):86-95.

**Kucyi, A., Davis, K.D** (2014). Dynamic functional connectivity of the default mode network tracks daydreaming. *NeuroImage* 100:471-80.

**Kucyi, A., Moayed, M., Weissman-Fogel, I., Goldberg, M., Freeman, B., Tenenbaum, H., Davis, K.D** (2014). Enhanced medial prefrontal-default mode network functional connectivity in chronic pain and its association with pain rumination. *Journal of Neuroscience* 34(11):3969-3975.

**Kucyi, A., Salomons, T.V., Davis, K.D** (2013). Mind wandering away from pain dynamically engages antinociceptive and default mode brain networks. *Proc Natl Acad Sci USA* 110(46):18692-7.

## News - CPIN Students (contd.)

[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 **Chloe McDonald (Institute of Medical Science, Supervisor Dr. Kevin C. Kain)** on recently completing the CPIN requirements and graduating from the program.

Chloe joined CPIN in January 2010 shortly after completing a Master's degree at Queen's University Centre for Neuroscience Studies. She is a recent CPIN graduate, having received her PhD from IMS in August 2014, studying under the supervision of Dr. Kevin C. Kain.

Her doctoral research focused on the impact of malaria infection in pregnancy on in utero neurodevelopment. Using a mouse model of malaria in pregnancy, Chloe studied the role of the complement cascade, specifically complement component C5a, in maternal infection-induced changes in neurodevelopmental outcomes. As a doctoral student Chloe received an Ontario Graduate Scholarship

in Science and Technology, a PEO International Chapter Scholar's Award, a CIHR doctoral award and a CIHR Michael Smith Foreign Study Supplement to work abroad in Tororo, Uganda.

Chloe is currently a postdoctoral fellow at the Harvard School of Public Health working with Dr. Wafaie W. Fawzi.

### Select Publications:

Darling A.M., **McDonald, C.R.**, et al. Relationship of angiogenic and inflammatory biomarkers in mid-pregnancy to smallness for gestational age in a prospective cohort of Tanzanian women. *AJOG* (2014)

Serghides, L., **McDonald, C.R.**, et al. PPAR $\gamma$  agonists improve survival and neurocognitive outcomes in experimental cerebral malaria and induce neuroprotective pathways in human malaria. *PLoS Pathogens* (2014)

**McDonald, C.R.**,\* Cressman, A.M.,\* et al. Experimental Malaria Infection Alters the Expression of Hepatobiliary and Placental Drug Transporters in Mice. *Drug Metabolism and Disposition* (2014) \*Indicates co-first authors

**McDonald, C.R.**,\* Elphinstone, R.L.,\* Kain, K.C. The impact of placental malaria on neurodevelopment of exposed infants: a role for the complement system? *Trends in Parasitology* (2013) \*Indicates co-first authors.

## Welcome New CPIN Faculty Members



**Dr. Romina Mizrahi's** (Associate Professor, Departments of Psychiatry, Institute of Medical Science and Pharmacology & Toxicology) research focuses on developing a better understanding of how the brain functions in-vivo. She has received funding from the Canadian Institutes of Health Research (CIHR) and the Ontario Mental Health Foundation (OMHF) to study dopamine using positron emission tomography (PET) in early psychosis and in those at risk for the disease. She also leads a new line of research to use a new F-18 radioligand to image neuroinflammation in-vivo and was in charge of translating this radioligand from the bench to the bedside at CAMH. This novel line of research received support of the Scottish Rite Charitable Foundation, the Alzheimer Society of Canada and the Brain & Behavior Research Foundation to carry out the first human experiments.

Using this new radioligand, her lab is currently investigating neuroinflammation in schizophrenia, clinical high risk for psychosis, Alzheimer's disease and mild cognitive impairment. Dr. Mizrahi has recently been awarded a \$1.6 million grant from the National Institutes of Mental Health (NIMH) to follow up on her neuroinflammation work.

Dr. Mizrahi has also just started the first human imaging studies of endocannabinoid metabolism in schizophrenia and clinical high risk for psychosis. This work has received initial pilot funding from the Brain & Behavior Research Foundation.



**Dr. Iva Zovkic's** (Assistant Professor, Departments of Psychology and Cell and Systems Biology) research is focused on epigenetic mechanisms of learning and memory. The overarching goal of her research is to clarify the role of chromatin dynamics in the initial process of memory acquisition and the protracted process of memory maintenance.

Dr. Zovkic recently identified histone variant exchange as a novel branch of epigenetics that regulates cognitive function, specifically demonstrating that the histone variant H2A.Z is a memory suppressor in the hippocampus and the cortex (Zovkic et al. 2014). Evidence for histone variant exchange in cognitive function introduces a new level of complexity to experience-induced gene regulation, suggesting that functionally-distinct histone variants can have tremendous consequences for memory strength and stability. Dr. Zovkic is interested in identifying mechanisms that regulate histone variant exchange during the normal process of memory formation and in understanding how this process becomes dysregulated during age-related cognitive decline.

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## Upcoming Events

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### CPIN Neurotalk

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

Speaker | **Vladislav Sekulic**, (Dr. Frances Skinner Lab, Department of Physiology)

Title | *Navigating in physical and memory space: the role of place cells and grid cells*

Date | **Thursday, February 26, 2015**

Time | 5:00 pm

Location | Medical Sciences Building, Room 2173, 1 King's College Circle, University of Toronto

Primary Organizers | CPIN Graduate Executives Vladislav Sekulic and Ayda Ghahremani

Free snacks will be provided!

### Conferences and Meetings

[http://neuroscience.utoronto.ca/events/Conf\\_M.htm](http://neuroscience.utoronto.ca/events/Conf_M.htm)

#### 25th Annual Rotman Research Institute Conference

Event Dates: **March 9-11, 2015**

Metro Toronto Convention Centre, 255 Front Street West, Toronto, ON, Canada

In March 2015 Rotman Research Institute conference will bring luminaries in the fields of neuroscience and psychology together with 500 attendees from around the world.

For the conference program and speaker details, visit: <http://research.baycrest.org/conference>

#### SickKids Centre for Brain & Mental Health's Annual Brain and Mental Health Day Conference on "Generation-Regeneration-Degeneration"

Event Date: **April 23, 2015**

PGCRL Auditorium, with overflow room (686 Bay Street)

The SickKids Centre for Brain & Mental Health hosts an exciting annual spring neuroscience research and education symposium called Brain & Mental Health Day. To find out more about this event, please visit the conference website:

<http://www.cvent.com/events/annual-sickkids-centre-for-brain-mental-health-day/event-summary-520162e584614832819d80508cc3c5c1.aspx>

#### UHN's 3rd International Conference on Knowledge Gaps in Parkinson's Disease & other Movement Disorders

Event Dates: **May 7th-10th, 2015**

Sheraton Centre Toronto Hotel, 123 Queen Street West, Toronto, Ontario, Canada

This conference will focus on aspects of Parkinson's disease (PD) and other movement disorders which are still insufficiently understood or have been recently challenged on genetic, pathogenetic, clinical and/or therapeutic grounds. To find out more about this event, please visit the conference website: [www.gapsinmds.com](http://www.gapsinmds.com)

## Positions Available: Biology Research Associate

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

This Research Associate or technician position is available in April 2015 in the Toronto area for a highly motivated individual with a background and expertise in rodent behavioral assays, microscopy techniques, and rodent surgery. Applicants must have published papers demonstrating expertise in these areas. The project entails the in vivo administration of macromolecules (biological therapeutics) into the rodent CNS. The area of application is in animal models of neurodevelopmental disorders including autism and fragile X syndrome. Please send a detailed CV and cover letter outlining your research experiences to: Dr. David R. Hampson at [d.hampson@utoronto.ca](mailto:d.hampson@utoronto.ca) (use "RA application" in subject heading).

## Reminders

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**Submissions for News Updates** The CPIN Office welcomes 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](mailto:p.neuroscience@utoronto.ca)

**Volunteer Opportunity at the 2015 Toronto Brain Bee** CPIN Faculty and trainee members are invited to volunteer at the **17th Annual Toronto Brain Bee** that will be held on **Friday, March 27, 2015** at the University of Toronto. Please fill out the online volunteer form at <http://www.neuroscience.utoronto.ca/events/brainbee.htm>

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