PHYSIO PROGRESS

Dr. John F. MacDonald Memorial Fund

John Ferguson MacDonald was the quintessential Canadian scientist. A visionary and an insightful researcher who transformed the field of neuroscience; John was a man whose humility, generosity, and deeply rooted respect for all transcended his outstanding scientific achievements. John passed away April 22, 2014 (obituary on page 4).

The Department of Physiology at the University of Toronto has created the Dr. John F. MacDonald Memorial Fund, in honour of our friend and colleague. This fund will be used to enhance the educational experience of Neuroscience trainees in the Department of Physiology. Through this fund, we will ensure that Dr. MacDonald's legacy continues to inspire future leaders in Neuroscience. We welcome any contributions to this fund.

Donations can be made on-line at: https://donate.utoronto.ca/give/show/101

THE FRASER MUSTARD INSTITUTE FOR HUMAN DEVELOPMENT - *Lighting a brighter path for the children of tomorrow* - *page 6*

Physio Progress *alumni newsletter*

Interim Chair - Dr. Steffen-Sebastian Bolz

The Department of Physiology is delighted to announce the appointment of Dr. Steffen-Sebastian Bolz as the Interim Chair of Physiology effective October 1st, 2014.

Steffen-Sebastian Bolz is a Professor and cross-appointed to the Heart & Stroke Richard Lewar Centre of Excellence in Cardiovascular Research. He is also an Associate Scientist in the Keenan Research Centre / Li Ka Shing Knowledge Institute at St. Michael's Hospital; Director of the Toronto Centre for Microvascular Medicine; and serves on a number of Faculty of Medicine committees; including the Dean's Advisory Committee on Research and the Taskforce on Biomedical Science Research Renewal.

Dr. Bolz's research focuses primarily on the molecular mechanisms that regulate peripheral resistance in the vascular system under physiological and pathophysiological conditions. He is the recipient of a number of research distinctions and awards, including the 2013 Heart and Stroke Foundation of Ontario Career Investigator Award and has been awarded numerous grants and published 39 peer reviewed papers, abstracts, and other scholarly work. In addition, he has supervised more than 30 trainees and teaches at both the graduate and undergraduate level.

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Celebration for the Outgoing Chair, Dr. Stephen Matthews

On September 23rd, the Department of Physiology hosted a celebration at the Faculty Club to thank Dr. Stephen Matthews for his immense contributions during his term as Chair. Dr. Matthews served as Interim Chair from 2007-09 and was the Ernest B. and Leonard B. Smith Professor and Chair from 2009-2014.

Dr Matthews was recently appointed Director of Research at the Fraser Mustard Institute for Human Development, a University-wide transdisciplinary initiative focused towards determining the early-life origins of health, learning and social function (more on page 6).

During his chairmanship, Dr. Matthews continued to advance research through integration and collaboration; revitalization of our education programs; strengthened and enriched faculty development; enhanced our profile, and fostered greater communications in the medical research and health care community.

Dr. Matthews played a pivotal role in establishing the Mats Sundin Fellowship in Developmental Health between the University of Toronto and the Karolinska Institute in Stockholm, Sweden. This fellowship will provide scientific exchange and training that will develop future health leaders in both countries.

"It's become increasingly clear that the early environment of the fetus and infant can have major influences on susceptibility to developing cardiovascular, metabolic and mental health disorders in later life. These elite Sundin research fellows will help advance our understanding of this complex relationship and assist our efforts to build trajectories towards health and away from disease.'

- - - - Dr. Stephen Matthews - - - -

Selected excerpts from well wishers

Dr. Catharine Whiteside (Dean of Medicine, Vice Provost Relations with Health Care Institutions, University of Toronto): Steve, I think you can be very, very proud to see all that you have accomplished and the impact on so many of the folks in this great Department. I have been very pleased to be the Dean at a time when the Department of Physiology has taken a great leap forward under the leadership of Steve Matthews.

Dr. Steffen-Sebastian Bolz (Interim Chair): You are not only effective and productive, you are a passionate leader and I have learned a lot from you.

Dr. John Challis (former Chair): So I want to thank and congratulate you on all these great accomplishments but also for being a close work colleague and collaborator over many years.

Vasilis Moisiadis (PhD trainee Matthews lab, representing the Graduate Association for Students in Physiology): I would like to thank Dr. Matthews and say that it's really been an honour to be part of your laboratory and continue to be part of your laboratory. Dr. Matthews always makes time for his students and graduate students in general.

Dr. Stephen Lye (Executive Director, FMIHD; Associate Director, Lunenfeld-Tanenbaum Research Institute, Mount Sinai Hospital, Professor, Ob-Gyn, Physiology and Medicine): Steve, thanks for all your effort, commitment, and dedication to making this department not only a success within U of T, but nationally and internationally.

Steve Lye, Stephen Matthews and Jenny Katsoulakos

Jenny Katsoulakos (Executive Assistant to the Chair): Steve, it's been a really great privilege working for you the last seven plus years. YOU are a great leader!

Dr. John Kingdom (Chair, Dept. of Obstetrics & Gynaecology, Professor, Ob/Gyn, Medical Imaging, Pathology & Physiology): It's truly been a special privilege to be one of your great friends and to watch the truly great impact you've had on this Department.

Stephen Matthews and Steffen-Sebastian Bolz

IN MEMORIAM - Dr. John F. MacDonald

It is with great sadness that we announce the passing of Professor John MacDonald, a distinguished Emeritus Professor in the Department of Physiology. John served as the Ernest B. and Leonard B. Smith Professor and Chair of the Department of Physiology for seven years (2001-08).

John Ferguson MacDonald was the quintessential Canadian scientist. A visionary and an insightful researcher who transformed the field of neuroscience; John was a man whose humility, generosity, and deeply rooted respect for all transcended his outstanding scientific achievements. John died April 22, 2014.

John was born in Vancouver where he spent most of his formative years. He received his undergraduate education at the University of British Columbia and completed a PhD degree in the University's Department of Physiology in 1975 under the supervision of Tony Pearson. After a postdoctoral stint with Glen Cottrell at the University of St. Andrews, John moved to the laboratory of Kris Krnjevic at McGill University. He also trained in the neurophysiology laboratory of Jeff Barker at the National Institute of Neurological and Communicative Disorders and Stroke (now the National Institute of Neurological Disorders and Stroke) in Bethesda, Maryland. John was recruited back to Canada in 1979 where he opened his own lab in what was then the Playfair Neuroscience Unit at the Toronto Western Hospital. John took up his first appointment at the University of Toronto, as an Assistant Professor in the Department of Pharmacology. He was promoted to Full Professor in 1991 in the Departments of Pharmacology and of Physiology. He successfully served as the Chair of the Department of Physiology from 2001-2008. Having shown not only outstanding scientific acumen but also great skill in administering academics, John was coaxed to London, Ontario to take the leadership of the Robarts Research Institute where he remained until retiring in 2013.

During his postdoctoral work, John developed a deep interest in chemical neurotransmitters in the brain. When he formed his own lab, he decided to focus his studies on the actions of excitatory amino acids such as glutamate, a decision that proved to be a turning point in cellular neuroscience. Although with his typical humility John often quipped that he made the decision to study excitatory amino acids because 'no one else was doing this', the move was nonetheless prescient as John discovered the voltage-dependence of a specific class of receptors in the mammalian central nervous system. These receptors (eventually termed NMDA receptors) were later found to be required for long-term synaptic modifications thought to underlie some forms of learning. By virtue of their voltage-dependence, NMDA receptors act as molecular coincidence detectors, a characteristic which, as depicted in virtually every textbook of neuroscience, allows a neuron to 'learn' to associate its firing activity with incoming synaptic signals.

Over the ensuing decades, John made many additional important contributions in the broad field of ion channels where he focused on their regulation by cell signaling pathways. He discovered the regulation of glutamate receptors by phosphorylation and postsynaptic scaffolding proteins. John also made major contributions that included the identification of nonselective cation channels in neuronal injury and the regulation of dopamine receptors by growth factor receptors. John published more than 200 scientific articles, many in top-tier journals, including Science, Nature, and Cell. His work was consistently supported by grants from the Canadian Institutes of Health Research, the Heart and Stroke Foundation of Canada, and the Natural Sciences and Engineering Research Council of Canada. His research contributions were recognized by his election to the Royal Society of Canada and to the Canadian Academy of Health Sciences. John's research has broad implications for understanding the cellular basis of stroke, pain, and neuronal injury. He was a co-founding member of NoNO Inc, a biotechnology company that is developing new therapies

John MacDonald with close friends & colleagues Mike Salter & Lu-Yang Wang

for stroke and pain. His contributions to the field of neuroscience have been extraordinary.

In addition to his scientific achievements, John has mentored a generation of neuroscientists. More than 50 postdoctoral fellows and graduate students who trained with him are now working in various laboratories around the world. Through John, these trainees learned sound scientific principles, openness to new theories, experimental rigour, and the importance of collegial collaboration. His open-mindedness also provided fertile ground for highly productive collaborations with clinician-scientists. John empowered all his collaborators, as well as his trainees, to see beyond the ordinary and to boldly challenge dogma and the status quo. John's tremendous scientific impact will endure long into the future.

Even more important than his science was his family – John was an outstanding husband and father. He and his wife Lidia had a relationship of love, respect and humour which was the envy of all who know them. He loved his daughter Kathy and son Jamie, unconditionally. He was extremely proud of Kathy's exceptional talent as an animator and her deep love for her family. His son Jamie was also his pride and joy; he is a talented musician, extremely successful MBA graduate and a profoundly loving son.

John MacDonald was an outstanding scientist and colleague, a loving husband and father, and a dear friend. His passion for life, his warmth, his dry wit and his charm are greatly missed.

Physiology Alumni Event - CAN Montreal

Our first University of Toronto, Department of Physiology Alumni reception was held in Montreal at the 2014 meeting of the Canadian Association of Neuroscience. The event welcomed former and current members of our department, students, and faculty. It also provided an opportunity to remember our friend and colleague, Dr. John MacDonald, the former Chair of the Department.

It was a wonderful gathering of over 100 people. Thank you to everyone who attended and to those who were unable, we hope to see you soon. What a wonderful tribute to our friend, colleague, teacher and collaborator.

As we mentioned, the Department has created the Dr. John F. MacDonald Memorial Fund in support of our students. We welcome all contributions and look forward to awarding the inaugural award next year (https://donate.utoronto.ca/give/show/101).

As a neuroscience family we have enjoyed reconnecting with everyone over the course of this conference. Neurotree is a great way that we can continue to track our linkages and maintain networks. Please take a minute to add your profile at www.neurotree.org.

Thank you to our alumni, trainees and friends for a successful inaugural event!

Drs. Stephen Matthews, Lu-Yang Wang, Beverley Orser, and Mike Salter

APPOINTMENT of Professor Graham Collingridge as Chair of Physiology (2015-2020)

Congratulations to Professor Graham Collingridge on his appointment as the new Chair of the Department of Physiology for a 5-year term effective May 1, 2015.

Graham Collingridge has been a faculty member at the University of Bristol since 1994, where he is a full professor of Neuroscience in Anatomy in the School of Physiology and Pharmacology. He served as Departmental Chair of Anatomy (1997-1999) and then Director of the MRC Centre for Synaptic Plasticity (1999-2012). From 1990 until 1994 he was the Departmental Chair in Pharmacology at the University of Birmingham.

A leading neuroscientist, Professor Collingridge's research focuses on the mechanisms of synaptic plasticity in health and disease, in particular, understanding synaptic plasticity in molecular terms and how pathological alterations in these processes may lead to major disorders, such as Alzheimer's disease.

Professor Collingridge obtained his undergraduate degree in Pharmacology from the University of Bristol and a PhD from the School of Pharmacy at University College London. He was a postdoctoral fellow in the Department of Physiology at the University of British Columbia and in the Department of Physiology and Pharmacology at the University of New South Wales in Sydney Australia.

Professor Collingridge has held visiting Professorships at the University of British Columbia and at Seoul National University. He served as Editor-in-Chief of Neuropharmacology from 1993 until 2010. In 1997 he was elected a Founder Fellow of the European DANA Alliance; and in 1998 he was elected a Founder Fellow of the Academy of Medical Sciences (UK). In 2001 he was elected a Fellow of The Royal Society, and from 2007 until 2009 he served as President of the British Neuroscience Association. Professor Collingridge has won several prizes including the Sharpey-Shafer Prize of the Physiological Society, the Gaddam Memorial Prize of the British Pharmacological Society, and the Feldberg Prize.

We look forward to Professor Collingridge's arrival in May.

The Fraser Mustard Institute for Human Development - lighting a brighter path for the children of tomorrow

Evidence is mounting that what happens to us in the first 2,000 days of life—from conception to age six—can be critical to our long-term well-being. However, as a society we still don't do enough to provide every child the opportunity to have the best start in life by optimizing this important developmental period. Too many of our kids are left behind academically, grow up to be overweight or obese, are at risk of developing health or mental health problems, or are otherwise not afforded the opportunities to develop to their full potential. This lost potential has an enormous cost to humans and society.

The Fraser Mustard Institute for Human Development (www.humandevelopment.utoronto.ca) is a bold and necessary response to this challenge, and is trying to meet it in ways that are innovative and groundbreaking in the academic world. The Institute brings together University of Toronto researchers from a variety of disciplines— education, medicine, economics, psychology, biology and social work - and the result of these combined transdisciplinary synergies is that academic silos are broken down and we generate new knowledge on early human development.

The Institute is named after Dr. J. Fraser Mustard (1927-2011) who received his M.D. from the University of Toronto in 1953, and was awarded his Ph.D. from Cambridge in 1956. His illustrious career included numerous remarkable accomplishments: among other triumphs, he was a founding member of McMaster University's medical school in 1966, and the founding president of the Canadian Institute for Advanced Research in 1982. In 1993, he was named a Companion of the Order of Canada.

Dr. Mustard was instrumental in propelling the subject of early child development into the national and international spotlight. One of his final projects was imagining and creating the Institute for Human Development at the University of Toronto.

Collaboration, Innovation and Impact

Dr. Mustard knew that academic development alone is not enough to make a difference in children's lives. There is a strong commitment at the Institute to unite all those responsible for the well-being of our children to create and share knowledge – researchers, policy makers, educators, social workers, health care providers, as well as families and caregivers, together as equal partners in making sure all children get the best possible start in life.

The Institute's directors and researchers are embedded within the University of Toronto's faculties of Education, Medicine, Social Work, Arts and Science, and includes others with cross-appointments to cutting-edge institutions and broader clusters such as the Toronto Academic Health Science Network and international partners, such as the Aga Khan University and the Karolinska Institutet in Stockholm, Sweden.

This concentration of knowledge and resources is one of the most advanced in the world and enables the Institute to embark upon an ambitious three-fold mission:

- To generate new transdisciplinary knowledge in early human development.

- To transmit this knowledge to affect change by working with practitioners and policy makers as well as the ultimate stakeholders: children and their families.

- To grow research and academic capacity through education and training of new generations of transdisciplinary researchers.

The Institute's research goals are organized along four main themes: Aboriginal Health and Well-being, World's Child, Healthy Kids, Developing Brain, and Human Potential. These four themes are supported by a core resource platform that includes an ambitious cohort study. In addition to its research goals, the Institute is equally committed to its education and knowledge mobilization strategies.

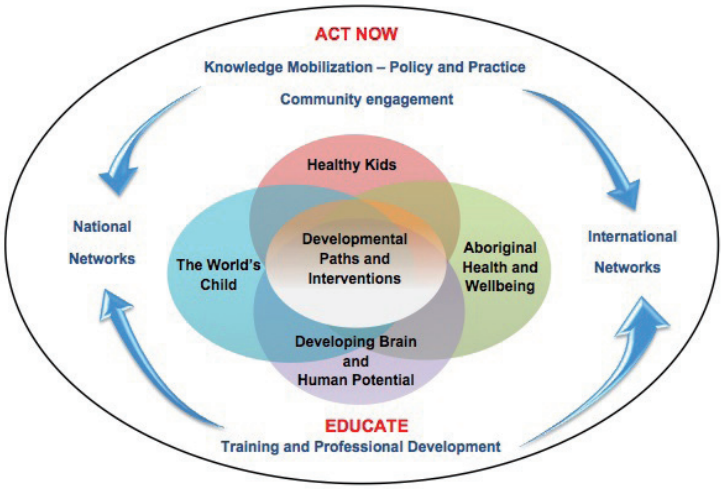

Dr. Stephen Matthews

In fact, the first cohort of students in a new Collaborative PhD Program in Human Development have just finished their year-end assignments. These students come from all the disciplines affecting early human development research and together they are learning the new language of transdisciplinary scholarship.

Knowledge mobilization is a core value of this program and of the Institute in general. Through key partnerships with policy makers and practitioner and communities the Institute is actively engaged in making sure new knowledge is translated into policies and practices that will start affecting children immediately. Indeed, the founding principles of the Institute include a commitment to an evidence-based approach to building the society of tomorrow.

Boundless Potential

The Institute is engaged in a $20 million fundraising campaign which is an integral part of the University of Toronto's unprecedented $2 billion Boundless campaign, the largest fundraising initiative for a university in Canadian history. This fundraising goal includes a promise to fulfill the boundless potential unique to U of T and provide international leadership in early human development. The goal of these extensive fundraising efforts is to create a permanent home on campus with the research infrastructure to allow transdisciplinary synergies to flourish.



The Department of Physiology played a major role in the development of the FMIHD. Professor Stephen Matthews (former Chair of Physiology) is the Director of Research and Professor Stephen Lye (cross-appointed to Physiology) is the Executive Director of the Institute. The Department of Physiology was also instrumental to the creation of the Collaborative PhD Program in Human Development.

The FMIHD Administrative Offices are based on the 7th floor of OISE, 252 Bloor Street West. For more information go to www.humandevelopment.utoronto.ca

HONOURS and AWARDS

We are delighted to announce the creation of the Christopher Perumalla Award which will be presented to the 'top' Physiology Major Student each year.

The Christopher Perumalla Award and the Colin Bayliss Award were presented by Drs. Michelle French and Patricia Brubaker at the annual Student Achievement Awards held on June 5th.

Professor Christopher Perumalla

2014 CIHR Synapse Mentorship Award: Professor Christopher Perumalla

Congratulations to Christopher Perumalla who is the recipient of the Canadian Institutes of Health Research (CIHR) Synapse Mentorship Award, which recognizes leaders who are dedicated to promoting health research among Canadian secondary school students. The Mentorship Awards identify the importance of mentors in developing Canada's next generation of health researchers. They honour persons who have made exceptional contributions to the promotion of health research among Canadian secondary school students.

Professor Perumalla is renowned for his dedication to students in the Faculty of Medicine and beyond. In his role as Director, Division of Teaching Laboratories, he is incorporating new research technologies to enhance the experience of undergraduate students. Chris was recognized in the individual accomplished researcher category in recognition of his efforts for designing and delivering the MED Youth Summer Program (YSP).

Christopher Perumalla Physiology Award

Congratulations to Jessie MacDonald who is the inaugural winner of the Christopher Perumalla Award for the top graduating Major student in Physiology.

Colin Bayliss Physiology Specialist Student Award

Congratulations to Rodolfo Benavides Guajardo who is this year's winner of the Colin Bayliss Award for the top graduating Specialist student in Physiology.

Faculty of Medicine Education Achievement Celebration, May 7, 2013 at Hart House

The 11th Annual Education Achievement Celebration was held on May 7, 2013 at the Great Hall in Hart House, University of Toronto. Faculty members from the Department of Physiology were highly successful in receiving a number of prestigious Faculty Awards.

Left-Right: Dr. Richard Horner., Dr. Heyu Ni, Dr. Carin Wittnich, Dr. Chris Perumalla, Dr. Nohjin Kee, Dr. Anthony Gramolini. Missing from photo: Dr. Stephen Matthews

©2013 Gustavo Toledo Photography

Excellence in Undergraduate Teaching in Life Sciences Award 2014: Nohjin Kee PhD

Congratulations to Dr. Nohjin Kee who is the 2014 recipient of the Excellence in Undergraduate Teaching in Life Sciences Award. The award recognizes sustained excellence in teaching, coordination and/or development of undergraduate lecture or seminar courses in Arts and Science offered by the Basic Sciences Departments in the Faculty of Medicine. The award was presented at the Faculty of Medicine's 12th annual Education Achievement Celebration on May 13, 2014.

David Keeling Award

The Department of Physiology is delighted to announce that Paula Smellie, Business Manager, Department of Physiology, was the recipient of the 2014 David Keeling Award for Administrative Excellence, Faculty of Medicine. This award, presented by Tim Neff and Dr. Cathy Whiteside, Dean, recognizes an individual who has demonstrated a sustained contribution of excellence over a period of at least five years and displays the core values of the Faculty of Medicine. In addition to providing outstanding administrative management, Paula has played a major role in co-ordination of the Department's renovations in the Medical Sciences Building, which are now approaching completion. Congratulations!

ALUMNI RECEPTION AND MACALLUM LECTURESHIP 2015

Please hold the date! Wednesday, May 13, 2015

We are delighted to announce that Dr. Mitchell Lazar, Chief, Division of Endocrinology, Diabetes, and Metabolism at the University of Pennsylvania is the 2015 Macallum & FIP lecturer.

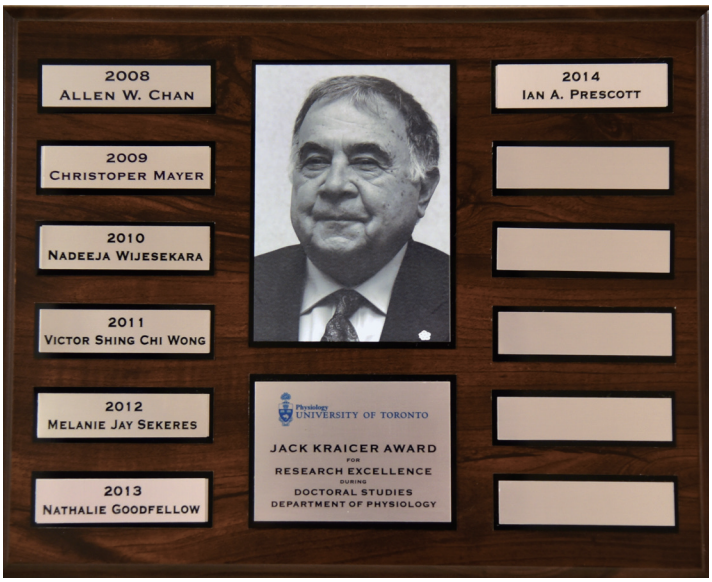
Dr. Lazar will deliver the Macallum Lecture on Wednesday, May 13th (4:00 p.m., J.J.R. MacLeod Auditorium, Medical Sciences Building, 1 King's College Circle) and will spend Thursday, May 14th with students and faculty for Physiology's annual research day, Frontiers in Physiology (FIP).

Jack Kraicer Award

The Jack Kraicer Award has been named in Dr. Jack Kraicer's honour for his dedication and contribution to the academic excellence of the Department's Physiology students for many years. Through his directorship of the CIHR grant writing course (PSL1066) he has established a tradition recognized as a highlight of our PhD program in the Department.

This award was established in 2007 and is awarded annually to the best PhD graduate to recognize excellence in scholarship during doctoral studies in the Department of Physiology. The criteria for nominations include overall accomplishment in terms of publications, teaching and extracurricular activities that contribute to the department. Each year the award winner receives an inscribed plaque and $1,000.

Jack obtained his MD and PhD (Physiology) from the University of Toronto. This was followed by postdoctoral training at Université Laval and Université Libre de Bruxelles. His first academic appointment was in Physiology at Queen's where he remained for 19 years. In 1984 he moved to the University of Western Ontario as Chair of Physiology. In 1993, he accepted the position of Director of Research Grants followed by a position as Senior Director of Scientific Affairs, the Human Frontier Science Program in Strasbourg, France. Jack's career came full circle with his return to the University of Toronto in 1997.



Jack's scientific activities focused on basic research in neuro-endocrinology, with a special interest in the actions and regulation of secretion of the pituitary gland hormones. He has held a number of scientific appointments and elected offices, serving on review committees of national and international granting agencies, councils of national and international scientific societies, and editorial boards of scientific peer reviewed journals. He has served as Editor of the Canadian Journal of Physiology and Pharmacology, and was President of the Canadian Physiological Society. Honours have included Visiting Scientist Awards from the MRC, the Prize for Excellence in Research from Queen's University, and the Sarrazin Lectureship of the Canadian Physiological Society.

The winner of the 2014 Jack Kraicer Award was presented to Dr. Ian Prescott by Dr. Martin Wojtowicz

Ian Prescott with supervisor William Hutchison & presenter Martin Wojtowicz

Ian Prescott completed his PhD thesis entitled "Synaptic Plasticity of Basal Ganglia Output Neurons in Movement Disorders" under the supervision of Dr. William Hutchison. Ian had six papers published, 1 accepted and 1 submitted. He received the Queen Elizabeth II Scholarships in Science and Technology and is presently working as a Postdoctoral Fellow at Queens University, Kingston, Ontario with Dr. Ron Levy.

This year's honourable mentions are Gabriella Rozanski (Stanley Lab) and June Guo (Giacca Lab).

Gabriella Rozanski completed her PhD thesis: "The Sandwich Synapse: Trans-glial Signalling Between Neuronal Somata in the Dorsal Root Ganglion" with Dr. E. Stanley. She is 1st author of four papers in J. Physiol. and Eur. J. Neurosci. and had received the CIHR doctoral research award.

June Guo completed her PhD thesis: "Effects of Insulin and Insulin Sensitizers on Neointimal Formation After Arterial Injury in Rodent Models" with Dr. A. Giacca. She had 5 papers published and 3 first author papers in revision or in preparation. She had a Doctoral Research Award from the Canadian Diabetes Association.

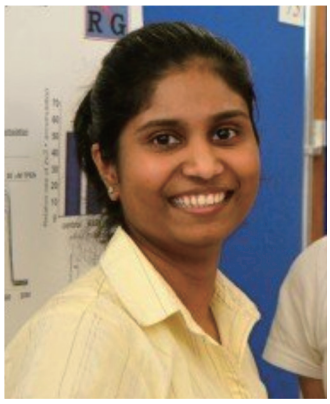
Past Winners of the Jack Kraicer Award

2013
Dr. Natalie Goodfellow
(Lambe Lab)

2012
Dr. Melanie Jay Sekeres
(Josselyn Lab)

2011
Dr. Victor Shing Chi Wong
(Brubaker Lab)

2010
Dr. Nadeeja Wijesekara
(Wheeler Lab)



2009
Dr. Christopher Mayer
(Belsham Lab)

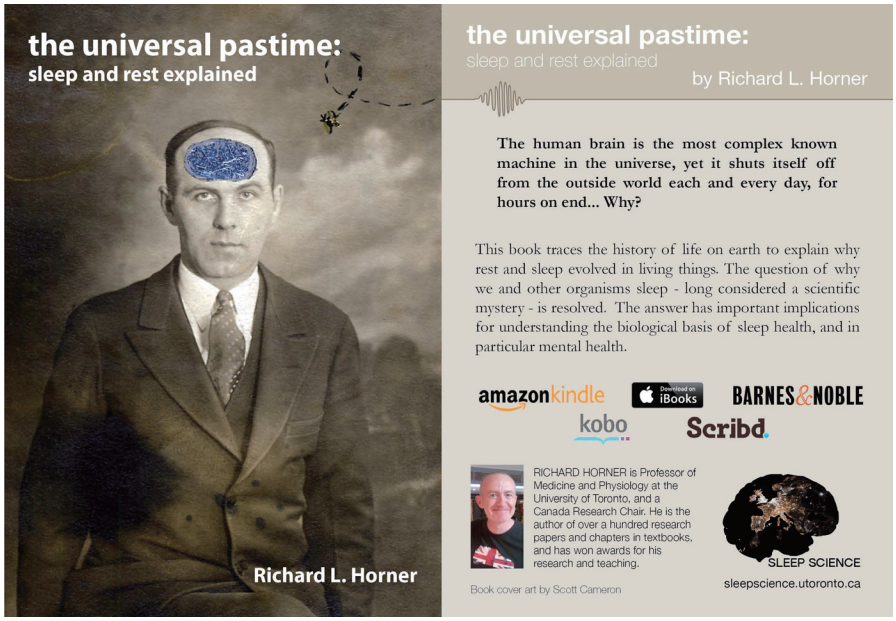
2008
Dr. Allen W. Chan
(Stanley Lab)

Congratulations to Dr. Richard Horner on the recent publication of his book:

The universal pastime: sleep and rest explained

About the author

Richard Horner received his undergraduate degree in Physiology from the University of Sheffield, UK in 1986. He then completed his PhD at the University of London, UK in 1991 followed by postdoctoral work in the Department of Medicine at the University of Toronto (1991-1994) and the University of Pennsylvania (1994-1997). He returned to a faculty position at the University of Toronto in 1997 where he is now Professor of Medicine and Physiology and a Canada Research Chair.



His research focuses on the brain cells and circuits controlling the states of sleep, drug-induced sedation and anesthesia, and their impact on vital functions such as breathing. He has over one hundred peer reviewed scientific publications and chapters in textbooks. Dr. Horner is also active in undergraduate and graduate teaching at the University of Toronto. He has won awards for these courses, as well as awards for linking teaching with research.

the universal pastime: sleep and rest explained by Richard Horner was released in December 2014 and it is now available at all major online bookstores.

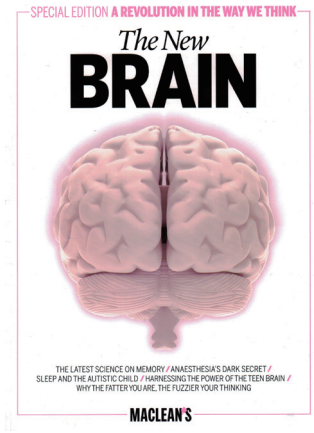
IN THE NEWS

Professor Stephen Lye was recently interviewed by several news agencies in relation to his recent manuscript on early labour:

Heng YJ, Pennell CE, Chua HN, Perkins JE, Lye SJ (2014) Whole Blood Gene Expression Profile Associated with Spontaneous Preterm Birth in Women with Threatened Preterm Labor. PLoS ONE 9(5): e96901. doi:10.1371/journal.pone.0096901

BBC (http://www.bbc.com/news/health-27407443)

Canadian Press (which was reported in CTV, CBC and Global) http://globalnews.ca/news/1333375/new-test-could-tell-if-early-contractions-means-woman-to-deliver/



Congratulations to Dr. Beverley Orser who had a terrific article published in a special issue of MacLean's Magazine entitled **"A Revolution In the Way We Think, The New BRAIN".**

In The New Brain, Maclean's presents some of the most intriguing science about the most complex organ of the body. Dr. Orser talks about how she and her colleagues are doing groundbreaking neuroscience research that will impact the way we think about general anesthesia. A very accessible read for both scientists and the general public, this article does a great job of articulating the challenges and some of the solutions we currently face in this field.

http://www.physiology.utoronto.ca/Assets/Physiology+Digital+Assets/Department+of+Physiology/Physiology+Digital+Assets/About/PhysioLINK/The+New+BRAIN.pdf

Nasal spray delivers new type of depression treatment

March 24, 2014 – Research from the Centre for Addiction and Mental Health (CAMH) shows a nasal spray that delivers a peptide to treat depression holds promise as a potential alternative therapeutic approach.

The study, led by CAMH's Dr. Fang Liu, is published online in *Neuropsychopharmacology*

Journal Reference:

Virginia Brown, Fang Liu. Intranasal Delivery of a Peptide with Antidepressant-like Effect. Neuropsychopharmacology, 2014; DOI: 10.1038/npp.2014.61

PRESS RELEASE - Cell Metabolism

April 1, 2014 - **Factor Present in Gestational and Type 2 Diabetes Could Provide New Treatment Options**

New research reveals that both pregnant women with diabetes and individuals with type 2 diabetes have high levels of a fat metabolite that impairs pancreatic cells from secreting insulin. The findings, which are published in the April 1 issue of the Cell Press journal Cell Metabolism, suggest that blocking the effects of this fat metabolite may help prevent and treat diabetes.

Journal Reference:

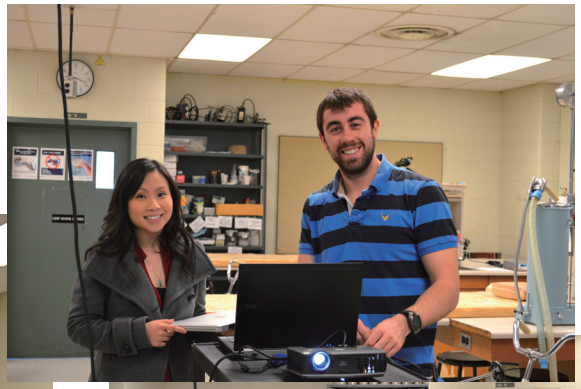
Kacey J. Prentice, Lemieux Luu, Emma M. Allister, Ying Liu, Lucy S. Jun, Kyle W. Sloop, Alexandre B. Hardy, Li Wei, Weiping Jia, I. George Fantus, Douglas H. Sweet, Gary Sweeney, Ravi Retnakaran, Feihan F. Dai, Michael B. Wheeler. The Furan Fatty Acid Metabolite CMPF Is Elevated in Diabetes and Induces β Cell Dysfunction. Cell Metabolism, 2014; 19 (4): 653 DOI: 10.1016/j.cmet.2014.03.008

5th Annual Physiology Day

On May 6, 2014, the Department of Physiology hosted the 5th Annual Physiology Day in cooperation with Graduate Association for Students in Physiology (GASP), Let's Talk Science, and the Division of Teaching Labs. Seventy grade 11 students from ten schools across Toronto attended to participate in three labs exploring the concepts of lung volume, blood pressure, and genetics. An outstanding team of twelve graduate students from the Department of Physiology led students through the experiments and provided guidance to students preparing for university after high school graduation. Students had a unique opportunity to conduct laboratory experiments in a university setting and appreciated advice from graduate students and faculty members regarding different paths in post-secondary education.

I would like to extend my thanks to all the faculty members who came out to support the students, the Division of Teaching Labs, GASP, and all volunteers involved in making the day-long event a great success!

Frances Wong – Graduate student, Cox Lab
Outreach Coordinator, GASP



Physiology
UNIVERSITY OF TORONTO

Your gift to the Physiology Annual Fund will support our Department's mission to excel in Research and Education

I am enclosing a gift of $ _____ in support of the Physiology Annual Fund (#0560007962)

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City: _____

Province: _____

Postal Code: _____

☐ Cheque enclosed
Made payable to the University of Toronto, Department of Physiology

☐ Visa ☐ MasterCard ☐ AMEX

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New Faculty Profiles

Darius J. Bägli, MDCM, FRCSC, FAAP, FACS

Dr. Darius Bägli is a Senior Attending Pediatric Urologist and the Associate Surgeon-In-Chief at The Hospital for Sick Children, and Senior Associate Scientist in the Division of Developmental & Stem Cell Biology at the SickKids' Research Institute. For many years, he has led translational cell and molecular biology research into the microenvironments regulating smooth muscle mechanotransduction and cell signaling. His lab is currently focused on the epigenetic mechanisms underlying cell-matrix interaction, urinary tract infection, and genital maldevelopment. He is also a Professor of Surgery at the University of Toronto and a full member of the graduate school's Institute of Medical Science. Dr. Bägli obtained his MDCM from McGill University, completed an NIH Research Fellowship and Urology Residency training at Harvard Medical School, and Pediatric Urology Fellowship training at the University of Washington. He has received peer reviewed funding from CIHR, the NIH, the Ontario Physicians Services Foundation, the Kidney Foundation of Canada, and the American Urological Association Research Foundation (AUAF). Dr. Bagli was recently named by his peers as the AUAF 2012 Distinguished Mentor, in recognition of his outstanding record of contributions to research and training in the field of urology and related sciences. This was the first time the award was given to a scientist in Canada, and the first ever to a Pediatric Urologic Surgeon.

Research Platform: Reproduction and Development
Contact: darius.bagli@sickkids.ca

R. Loch Macdonald, MD, PhD, FRCSC, FACS

Dr. Loch Macdonald is Head, Division of Neurosurgery and the Keenan endowed chair and Professor of Surgery, University of Toronto. He went to medical school at the University of British Columbia, trained in neurosurgery at the University of Toronto and undertook his PhD. in experimental surgery at the University of Alberta. He worked at the University of Chicago Division of Neurosurgery from 1993 to 2006 and came back to Toronto in 2007. For the past 25 years, he has been involved in clinical and translational research in subarachnoid hemorrhage and other forms of hemorrhagic stroke and brain injury.

Research Platform: BRAIN
Contact: MacdonaldLo@smh.ca

John Kingdom, MD, FRCSC (ObGyn & MFM), MRCP (UK), FRCOG

Dr. John Kingdom is the Gordon C. Leitch Chair of the Department of Obstetrics and Gynaecology, Faculty of Medicine, University of Toronto. He graduated from Trinity College, Dublin, Medical School in 1984. He then survived dual residency training in Paediatrics and Obstetrics-Gynaecology in Glasgow, Scotland, where he developed his research interest in the placenta. He then moved to University College Hospital, London for his fellowship in maternal-fetal medicine (MFM) in 1994. Four years later he was recruited to his current position in MFM and Obstetrics at Mount Sinai hospital, Toronto in 1998.

Dr. Kingdom's basic and clinical research interests in placental development and pathology are funded by CIHR, the Ontario PSI Foundation and his Rose Torno Chair. He directed the Toronto Royal College MFM fellowship program for 10 years and has received University, Provincial and National teaching awards. Currently he is the Director of Maternal Fetal Medicine Ob-Gyn at the University of Toronto

Research Platform: Reproduction and Development
Contact: jkingdom@mtsinai.on.ca

John Laffey, MD, MA, FCARCSI

Dr. John Laffey is the Anesthetist-in-Chief at St Michael's Hospital, Toronto, he is a Scientist at the Keenan Research Centre at the Li Ka Shing Knowledge Institute at St Michael's Hospital, and is a Full Professor at the University of Toronto (Primary Department: Anaesthesia).

Dr. Laffey's major research interest is centred on investigation of the pathophysiology of, and development of therapeutic strategies for Acute Respiratory Distress Syndrome, a devastating disease which causes severe respiratory failure in critically ill patients, and for which there are currently no specific therapies. Specific interests include the therapeutic potential of stem cells and gene based therapies for Acute Respiratory Distress Syndrome, and the study of the effects and mechanisms of action of hypercapnia in the acutely injured lung.

Research Platform:
Cardiovascular
Contact: Laffeyj@smh.ca

Clifford Librach, MD, FRCS(C), FACOG(REI)

Dr. Clifford Librach is a graduate of University of Toronto, where he completed his undergraduate and his graduate Degree in Medicine. He continued at the University of Toronto to obtain a specialty degree in Obstetrics and Gynecology. Dr. Librach went on to spend 3 years at the University of California in San Francisco becoming a board certified Reproductive Endocrinologist and Infertility Specialist.

Since 1991 Dr. Librach has been an Associate Professor in the Department of Obstetrics and Gynecology at the University of Toronto. He has a clinical position in the Division of Reproductive Endocrinology & Infertility, Department of Obstetrics and Gynecology at Sunnybrook Women's College Hospital and is a Co-Director of the University of Toronto Polycystic Ovarian Syndrome Clinic. He is the principal investigator in various clinical and embryology studies and on-going research at Women's College Hospital and University of Toronto.

Dr. Librach has published numerous research articles and is frequently interviewed for television, radio and print media.

Dr. Librach is the Director of the CReATe Fertility Centre.
Research Platform: Reproduction and Development
Contact: cliffl@ican.net

M. Cristina Nostro, PhD

Dr. Cristina Nostro is the Harry Rosen Chair in Regenerative Medicine and Diabetes Research, a scientist at the Toronto General Research Institute and also a member of the McEwen Centre for Regenerative Medicine, where she is studying the development of the pancreatic lineages from human pluripotent stem cells (hPSCs}.

Her long-term goal is to translate the results of her studies to the clinic and to establish in vitro culture systems for disease modeling, drug toxicity and discovery assays. Her future studies at the McEwen Centre will be aimed at further defining the factors that control pancreatic specification with the goal of developing novel stem cell-based therapies for diabetes.

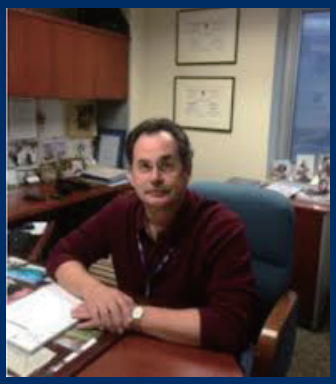
Research Platform: Endocrine and Diabetes Research Group
Contact: cnostro@uhnresearch.ca

Catherine O'Brien, BSc, MD, PhD, FRCSC

Dr. Catherine O'Brien is an Assistant Professor in the Department of Surgery at University Health Network and a Scientist at the Ontario Cancer Institute. She obtained her MD from Queen's University and completed a General Surgery residency at the University of Western Ontario. Dr. O'Brien subsequently went on to complete a fellowship in surgical oncology at University of Toronto, specializing in gastrointestinal malignancies. During her fellowship she also completed a PhD at the University of Toronto studying cancer stem cells in colorectal cancer. The focus of Dr. O'Brien's lab is to identify the molecular pathways responsible for driving tumour growth in colorectal cancer. The ultimate goal being to utilize this knowledge to devise improved therapeutic strategies for colorectal cancer.

Research Platform: Endocrine and Diabetes Research Group
Contact: cobrien@uhnres.utoronto.ca

James W. Scholey, MD, PhD, FRCPC



Dr. James Scholey is a Professor in the Department of Medicine with clinical appointments in the Division of Nephrology at the University Health Network and Mount Sinai Hospital. His laboratory is located in the Medical Sciences Building and he has a graduate school appointment in the Institute of Medical Sciences. He originally obtained his MD from the University of British Columbia and then completed a General Medicine Residency at the University of Toronto and the University of British Columbia.

Dr. Scholey subsequently went on to complete a clinical and research fellowship in the Division of Nephrology at Stanford University School of Medicine, specializing in mechanisms of progression of chronic kidney disease. The focus of his laboratory is the identification of molecular mechanisms responsible for the progression of chronic kidney disease with a special focus on diabetic nephropathy and the renin angiotensin system. His overall goal is to identify new therapeutic targets for the treatment of chronic kidney disease using animal and cell-based model systems.

Research Platform: Endocrine and Diabetes Research Group
Contact: james.scholey@utoronto.ca

Congratulations to Sonia Sugumar (MSc trainee, spv. Dr. Carlen). Sonia was recently featured in an exciting article on brain health and neuroscience.

October 02, 2013

UNLOCKING THE MYSTERIES OF HYPOGLYCEMIC SEIZURES

By: Erin Howe, writer with the Faculty of Medicine at the University of Toronto

It's the part of our body that controls what we think, the ways we move and how our other organs function. Though we know the brain plays an important role in our day-to-day life, there's still a lot to learn about how it works.

Sonia Sugumar is excited to help unlock those mysteries.

"I feel like it's still one part of our human body that we have a very limited understanding of," she says. "We still know relatively little about the brain compared to what we know about the rest of the body."

Sugumar is completing a master's degree in Physiology through the University of Toronto's Collaborative Program in Neuroscience, which includes graduate students from 15 departments in six Faculties at the University of Toronto.

"[The program] really helps bring us all together," says Dr. Peter L. Carlen, Sugumar's supervisor, and a Professor in the Faculty of Medicine's Departments of Medicine (Neurology) and Physiology. "We've got an enormous reservoir of neuroscience talent across the university, and we need something to pull us together and this program does it."

Carlen is also the Senior Scientist in the Division of Fundamental Neurobiology at Toronto Western Research Institute. His lab is the site of several research projects, including work on the cellular mechanisms and nervous system communications in epilepsy, exploring what happens during transition into seizure.

Sugumar is involved in another project within Carlen's lab, and is exploring the ways low blood glucose levels can affect electrical activity within the brain to cause hypoglycemic seizures, which can be the result of an insulin overdose in people with diabetes.

Using mice, the lab is looking at the role of an artificial cerebral spinal fluid composition, which bathes the brain. The group is exploring the various components that make up this fluid and how they affect the brain.

In particular, Sugumar is adding to what is known about gap junctions, which are "bridges" between brain cells that allow the passage of electrical signals in the form of calcium or sodium ion movement, generated by small molecules like glucose. She's zeroing in on how the absence or presence of these "bridges" can affect brain activity in the presence of very low blood glucose levels.

It's an area that's been well-studied in the context of other medical conditions such as epilepsy and ischemic stroke.

Sugumar is passionate about this field of study. She became interested in neuroscience during her undergraduate studies. A summer job at the National Research Council in Ottawa allowed her to gain valuable microscopy techniques that led her into Carlen's lab.

"The aspect of just how much there is left to learn really drew me in to neuroscience," says Sugumar.

With just a short time left before she completes her degree, Sugumar plans to publish her findings in the near future. She's confident that what she's researching today could become a building block for new developments long into the future.

"Even the smallest contribution can have the potential to make a huge difference."

The Department of Physiology values our alumni connections and is proud of your achievements. We're interested in staying in touch and hearing your updates.

Let us know where you are working or studying now, what you've published and where you've presented. Please submit your updates and contact information to medicine.advancement@utoronto.ca and you'll receive news and event invitations from Physiology and U of T Medicine.