



## January

**Structural Biology: New Method of Investigation:** Exciting findings from OCI's Drs. [Mitsuhiko Ikura](#) and [Vuk Stambolic](#) show that nuclear magnetic resonance (NMR)—a technique used to study the structural features of molecules—can monitor structural changes over time in the protein Rheb. Such information is essential for understanding how cancer-specific, abnormal Rheb signals govern tumour progression. This methodology will allow investigators to view changes in protein structure and activity in 'real-time'. [[Pubmed abstract](#)]

**Cardiology: Tackling Kidney Risk Factors:** TGRI's Dr. [Keyvan Karkouti](#) with Drs. [Terrence Yau](#), [Stephen Froles](#), [Stuart McCluskey](#), [Scott Beattie](#), and Duminda Wijeyesundera identified modifiable risk factors of acute kidney injury (AKI) following cardiac surgery that could greatly affect patient outcome. Study findings showed that preoperative anemia, red blood cell transfusions and surgical reexploration are three factors independently associated with AKI that can be controlled by health care teams. [[Pubmed abstract](#)]

## February

**Regenerative Medicine: Discovering New Lung Repair Methods:** A new population of bone marrow cells has the potential to reconstruct damaged airways and to be developed as a novel method of cell-based or regenerative therapies for lung disease. TGRI's Dr. [Thomas Waddell](#), Amy Wong (PhD student) and Dr. [Armand Keating](#) discovered the population of cells expressing the Clara cell secretory protein (CCSP)—a marker of airway progenitor and stem cells—through a series of experiments. When these CCSP-expressing cells were injected into naphthalene-damaged lungs, they preferentially migrated to the damaged areas and developed into multiple airway cell types. [[Pubmed abstract](#)]



### *A selection of honours conferred this year.*

#### **OCI Investigator Wins Rawls Prize**

Dr. Geoffrey Liu was awarded the 2008 William E. Rawls Prize sponsored by the Canadian Cancer Society. The award—presented to a young investigator—recognizes Dr. Liu's research contributions in pharmaco-genetic epidemiology and medical oncology which have led to important advances in cancer control within the past decade.



#### **Five Canada Research Chairs Renewed**

UHN congratulates Drs. Kevin Kain (Tier I Canada Research Chair in Molecular Parasitology); Alejandro Jadad (Tier I Canada Research Chair in eHealth Innovation); Dr. Claire Bombardier (Tier I Canada Research Chair in Knowledge Transfer for Musculoskeletal Care); Peter Cheung (Tier II Canada Research Chair in Chromatin Regulation); and Allen Volchuk (Tier II Chair in Diabetes) on the renewal of their Canada Research Chairs.

In addition, Dr. Bombardier was awarded funds from the Canada Foundation for Innovation to establish the "Post-Marketing Surveillance Infrastructure for Arthritis: Supporting the Optimal Use of Therapies and Best Practices for Rheumatologic Care in Canada"

#### **Alcon Research Institute Celebrates OCI Investigator**

Dr. Brenda Gallie was recognized by the Scientific Selection Committee of the Alcon Research Institute (ARI) for her outstanding research in the study of vision. The ARI supports global advancements in eye health by honouring those who make outstanding research contributions to the vision sciences.



## March

**Cancer: Deciphering Important Gene Patterns:** Tumour stage is currently the best predictor of patient survival in non-small cell lung cancer (NSCLC); however, findings from a study led by Dr. [Igor Jurisica](#), his graduate student Paul Boutros, and Drs. [Frances Shepherd](#), [Ming-Sound Tsao](#) and [Linda Penn](#) may have important prognostic information that could affect treatment strategies. The team developed an algorithm and used it to analyze data from four previous lung cancer studies. The algorithm could accurately predict patient survival outcomes, a result validated in four external datasets, and the largest pooled data set from eight separate NSCLC studies. [[Pubmed abstract](#)]



**Neurology: New Tools Investigating Development:** Dr. [Philippe Monnier](#) and colleagues engineered several specific antibodies (scFvs) to study proteins in the brain. They found that the scFvs could maintain regions of proteins in an orientation that allowed the proteins to be studied over a two week period. The antibodies also specifically recognized RGMa, the protein responsible for regulating proper axon pathfinding during development. These new tools will be used in future studies to help us better understand vision and where treatment strategies for vision loss can be used. [[Pubmed abstract](#)]

## April

**Malaria: Discovering Diagnostic Tools:** An international study led by TGR1's Dr. [Kevin Kain](#) discovered promising biomarkers for cerebral malaria (CM) that may one day serve as a prognostic test for severe malaria. Findings showed that protein levels of ANG-1 and the ratio of ANG-2:ANG-1 had a sensitivity and specificity of 100% for distinguishing CM in Thai adults and 70% and 75% respectively for Ugandan children. Low levels of the ANG-1 protein predicted subsequent mortality in children. As such, ANG-1 and ANG-2 proteins may play a role in the pathogenesis of CM and are accurate biomarkers to discriminate CM from uncomplicated malaria. [[Pubmed abstract](#)]



## May

**Cancer: Boosting the Body's Immune System:** Drs. [Pamela Ohashi](#) and [Tak Mak](#) devised a method that can boost the body's immune system and direct it to specifically target cancer cells. The team combined a viral vaccine with interleukin-7—an important protein necessary for proper immune development—to show that the combination was able to significantly improve the ability of key immune cells to attack tumours. [[Pubmed abstract](#)]

**ADHD: Identifying the Interplay of Genetics:** Dr. [Cathy Barr's](#) study of children with reading disabilities (RD) and attention-deficit/hyperactivity disorder (ADHD) revealed the possible contribution of shared genetic factors to these disorders. Genetic testing of specific regions of chromosome 6—a region known to hold a risk gene for RD—found that the VMP/DCDC2 gene region is strongly associated with inattention and hyperactivity symptoms in children with ADHD. This suggests that, in addition to RD, this region on chromosome 6 may contribute to ADHD. [[Pubmed abstract](#)]

## June

**Primary Biliary Cirrhosis: Surveying Disease Genetics:** Genome-wide studies by Drs. [Katherine Siminovitch](#) and [Jenny Heathcote](#) showed that changes in the HLA, IL12A and IL12RB2 genes were strongly associated with risk for primary biliary cirrhosis (PBC), an autoimmune disease of the liver targeting the small bile ducts. The study confirmed a major role for the immune system in the

## OCI Director Honoured with Prestigious Award

Dr. Benjamin Neel received one of two prestigious Premier's Summit Awards in Medical Research. Dr. Neel was recognized for his significant and distinguished ongoing contributions to the field of cell signaling in several human diseases, including those associated with developmental defects and cancer.



Over the next five years, the Province will provide Dr. Neel with \$2.5M in funding support towards expanding a research program to determine the detailed pathophysiology underlying developmental disorders associated with several types of childhood and adult leukemias. The award will support studies to elucidate the mechanisms underlying HER2+ breast tumour development.

## Society Recognizes TWRI Researcher

Dr. Karen Davis was inducted as a new member of the Johns Hopkins Society of Scholars. The induction recognizes her as a former Johns Hopkins postdoctoral fellow who has gained marked distinction in her field of research. Her work has significantly increased the understanding of pain, attention and plasticity associated with neurological and psychiatric disease.



## American Society of Hematology Lauds UHN

Dr. John Dick was awarded the E. Donnall Thomas Lecture and Prize from the American Society of Hematology in recognition of his pioneering research achievements in the field of hematology. Dr. Dick was recognized for his work in developing a human blood stem cell assay using immune-deficient mice and for leading the team that identified leukemia stem cells.



## CIHR Noble Awarded to UHN Researcher

Dr. Brian Wilson was presented with the Canadian Cancer Society's 2009 Robert L. Noble Prize. The prize is awarded annually to a Canadian investigator who has made outstanding



development of PBC and identified the IL12 pathway as a potential therapeutic target. Drugs regulating this pathway are available and this study paves the way for a new approach to treating PBC patients. [[Pubmed abstract](#)]

## July

**AL-amyloidosis: Finding New Treatment Strategies:** Phase I study findings from Dr. [Donna Reece](#) showed that the drug bortezomib demonstrated a good safety profile when administered once- or twice-weekly in relapsed patients with AL-amyloidosis (AL). AL is a protein conformational disorder related to multiple myeloma where the structure of certain proteins becomes mutated and abnormally deposited in organs and/or tissues. Phase II studies of bortezomib's activity and tolerability in AL are currently underway. [[Pubmed abstract](#)]

## August

**Lung Cancer: Enhancing the Decision-Making Process:** Dr. [Natasha Leigh](#) and colleagues Drs. [Frances Shepherd](#) and [Andrea Bezjak](#) examined non-small-cell lung cancer patients' perceptions of value pertaining to their health outcomes during and after adjuvant chemotherapy treatment. Over the long term, chemotherapy not only improved overall survival, but also improved a patient's quality of survival. [[Pubmed Abstract](#)]

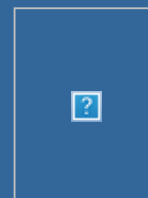
## September

**Diabetes: New Protein Targets the Gut:** Dr. [Tony Lam](#) discovered that activating receptors of the CCK protein hormone in the gut rapidly, and potently, lowered blood glucose levels by triggering a signal to the brain, and then to the liver, to lower glucose or sugar production. In the same experiment, CCK failed to lower blood glucose in a high-fat diet. Learning how to overcome CCK-resistance in the gut so that blood sugars can be lowered could be a new therapeutic approach to diabetes and obesity. [[Pubmed Abstract](#)]

achievements in cancer research. Dr. Wilson was recognized for his pioneering research in developing various optic tools that can be used for minimally invasive cancer treatment and early diagnosis.

### TGRI Researcher Awarded an ERA

Dr. Tony Lam received an Early Researcher Award in Round 5 of the Ontario's Ministry of Research and Innovation competition. The award supports Dr. Lam's research program in understanding the physiology and molecular aspects of central nervous system sensing and its potentially novel role in the regulation of blood cholesterol levels. His work also aims to identify new molecular candidates and strategies targeting the brain to lower blood cholesterol levels in cardiovascular disease, diabetes and obesity.



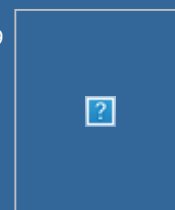
### Canada Research Chairs Renewed

UHN congratulates Drs. Claire Bombardier (Tier I Chair in Knowledge Transfer for Musculoskeletal Care) and Allen Volchuk (Tier II Chair in Diabetes) on the successful renewal of their Canada Research Chairs.

In addition, Dr. Bombardier was awarded funds from the Canada Foundation for Innovation to establish the "Post-Marketing Surveillance Infrastructure for Arthritis: Supporting the Optimal Use of Therapies and Best Practices for Rheumatologic Care in Canada".

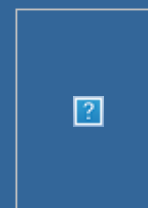
### UHN Lupus Researcher Recognized

Dr. Murray Urowitz was the recipient of the 2009 Evelyn V. Hess Award from the Lupus Foundation of America. Dr. Urowitz was recognized for his contributions to advancing our understanding of the pathophysiology, etiology, epidemiology, diagnosis and treatment of lupus.



### TWRI Researcher Captures CIHR Award

Dr. Nizar Mahomed was one of eight recipients of the Canadian Institutes of Health Research (CIHR) – Canadian Medical Association Journal (CMAJ) Top Canadian Achievements in Health Research awards. In this inaugural award round, Dr.



## October

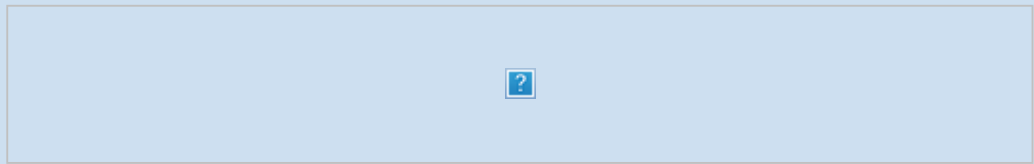
**Atherosclerosis: Understanding the Beginnings of Disease:** Dr. [Myron Cybulsky](#) surveyed how immune cells accumulate in artery walls to form the initial lesions of atherosclerosis (in response to a high-fat diet). The study showed that immune cells, in the artery wall divide and more immune cells are recruited from the blood into the artery wall, thus thickening the wall. The team also discovered that the GM-CSF protein is responsible for immune cell division in early lesions. This provides evidence for future treatments targeting GM-CSF to specifically prevent immune cell division that contributes to the inception of atherosclerosis. [[Pubmed abstract](#)]

**Stroke: Protein Suppression Prevents Brain Cell Death:** Findings from the lab of TWRI's Dr. [Michael Tymianski](#) are helping investigators prevent brain cell death that can occur after stroke when the brain is deprived of oxygen. The team used a gene therapy approach in an animal model to specifically block the production of TRPM7—a protein responsible for causing cell death—in the hippocampus, a region of the brain responsible for high level functions such as learning, memory and emotion. By selectively blocking TRPM7 in the hippocampus (a region very sensitive to oxygen deprivation), the team was able to prevent irreversible brain cell death following a stroke. [[Pubmed abstract](#)]

## November

**Lung Transplantation: Gene Therapy Repairs Injured Lungs:** Dr. [Shaf Keshavjee](#) and his team were the first to successfully use gene therapy to repair previously unsuitable donor lungs for transplantation. Conducted outside the body, animal and human models of end-stage lung disease were used to probe inflammation and organ rejection, two main complications after transplant surgery. Lungs treated with IL-10 gene therapy had significantly improved blood flow throughout the organ and were considerably better at taking in fresh oxygen and removing carbon dioxide. The effect was so significant it lasted up to 30 days post-surgery. [[Pubmed abstract](#)]

**Parkinson's Disease: 'Stimulating' Ways to Prevent Falls:** A TWRI team is pioneering the use of deep-brain stimulation (DBS) of the pedunculopontine nucleus (PPN)—a region of the brain involved in posture and gait control—to help prevent falls in patients with advanced Parkinson's Disease (PD). TWRI's Dr. [Andres Lozano](#) along with Drs. [Elena Moro](#), [Jonathan Dostrovsky](#) and [William Hutchison](#), conducted a double-blind study that found that patients that had undergone surgery to implant the electrodes for DBS in the PPN reported a significant reduction in the number of falls two years post-surgery. Significant improvements were also noted in walking and other non-motor features such as rapid eye movement sleep. [[Pubmed abstract](#)]



## April

**UHN and UT Welcome New Institute:** The new University of Toronto Transplantation Institute opened May 4, 2009, which created an Institute of the highest academic and clinical quality to support innovative and transformative research, education and patient care in the field of transplantation. The new institute builds upon the 20-year history of the Multi-Organ Transplant (MOT) Program's experience and leadership in transplantation excellence.

UHN's Dr. [Gary Levy](#) will act as Founding Director and will be guided by a 12-

Mahomed was recognized for having led 35 hospitals in the introduction of new procedures for hip and knee surgery. These procedures have reduced wait times, cut rehabilitation stays and dramatically improved patient outcomes.

### UHN Researcher Wins Clifford Prize

Dr. John Dick was awarded the prestigious 2009 Clifford Prize for Cancer Research for his pioneering work in cancer stem cell research. Dr. Dick's finding that not all cancer cells are the same has helped propel cancer research into new and revolutionary directions.

### OCI's Dr. James Till Honoured

UHN congratulates Dr. James Till for being one of the inaugural inductees into the new Innovators Hall of Fame—created by the University of Saskatchewan's Brett Wilson Centre for Entrepreneurial Excellence—which recognize researchers with a connection to the university who have changed the way people live, work and play.

This induction recognizes Dr. Till for being a proponent of open access technology for medical journals related to cancer.

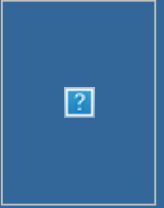
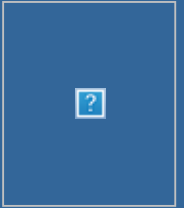
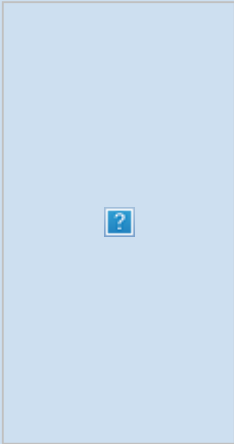
### TWRI Researcher Receives Olivecrona Medal

On December 4, 2009, UHN's Dr. Michael Fehlings received the 2009 Olivecrona Medal at the Karolinska University Hospital in Stockholm, Sweden. Dr. Fehlings was selected to receive the prestigious award for his significant contributions to spinal cord research.

Established in 1976, the award honours Dr. Herbert Olivecrona and acknowledges outstanding neurosurgeons/neuroscientists who contribute excellence to the neurosurgical field, based on development of microsurgical techniques, pedagogical skills or scientific contributions.



### Welcome Dr. Muthuswamy



member advisory board.

## July

**New CFI Funding Announced:** On June 19, 2009, the Canada Foundation for Innovation announced funding to three UHN-led projects totaling \$15.4M in new infrastructure support.

- "Ontario Regional Center for Cell and Vector Production" led by TGRI's Dr. [Armand Keating](#), \$7.3M
- *Robotic Positioning for Image-Guided Surgery and Radiation Therapy*", led by Dr. [David Jaffray](#), \$5.5M
- "NanoMed Fab: A Nanofabrication Centre for Personalized Medicine", led by Dr. [Gang Zheng](#), \$2.4M

In October, the Ministry of Research and Innovation (MRI) also announced matching funding to support these three projects through the Ontario Research Fund - Research Infrastructure Program. Collectively, this equates to approximately \$30.8M in new funding support.

**MRI Awards Support to UHN Researchers:** Drs. [Ming-Sound Tsao](#) and [Igor Jurisica](#) were awarded funding in Round 3 of the Ministry of Research and Innovation's Ontario Research Fund Research Excellence program. Their proposal entitled "Integrated Molecular Pathology of Targeted Cancer Therapy in Lung Cancer", includes team members Drs. [Frances Shepherd](#), [Geoffrey Liu](#), Mike Moran and [Thomas Kislinger](#).

The project will receive upwards of \$4.6M to develop unique, patient-derived xenograft models of lung cancer. It will also help to develop a robust informatics platform to comprehensively define the molecular genetic abnormalities and critical pathways in the disease. It is anticipated that this innovative project will help overcome current challenges in developing effective therapies for non-small cell lung cancer (NSCLC).

**Pfizer and MRI Inject Funds to UHN:** On July 16, 2009, Pfizer Inc. and the Ministry of Research and Innovation announced a new partnership with UHN and the Ontario Institute for Cancer Research that will invest \$6.9M towards finding abnormalities in the genetic makeup of colon cancer cells and developing drugs to target these aberrations.

Led by Dr. [Bradly Wouters](#), the project will develop drugs that target abnormal genes, and aim to develop tests to determine what kind of tumour a patient has and whether the patient is likely to benefit from a particular treatment strategy. The team is also working towards creating tests that evaluate the success of a treatment after it has been administered.

Other investigators involved in the project include: Drs. [John Dick](#) and Catherine O'Brien who are establishing new experimental models of cancer directly from cancer stem cells in patients; and Dr. [Patricia Shaw](#) who runs the tumour bank with tissue from patients treated at TGH.

**Terry Fox Foundation and UHN:** UHN congratulates Drs. [Bradly Wouters](#), [Robert Bristow](#) and [Christopher Paige](#) on their successful Terry Fox Foundation New Frontiers Program Project Grants that will provide new operating and equipment support over the next five years.

Drs. Wouters and Bristow (Program leaders) were awarded \$4.98M to support their project entitled "Hypoxia in Tumours: Clinical and Experimental Studies". Team members include Drs. [Richard Hill](#), [David Hedley](#), [Michael Milosevic](#), [Anthony Fyles](#), Marianne Koritzinsky, [David Jaffray](#), [Ivan Yeung](#), and Christine Allen.

Dr. Senthil Muthuswamy, Senior Scientist and the Lee K. and Margaret Lau Chair in Breast Cancer officially joined the Ontario Cancer Institute. Dr. Muthuswamy's laboratory explores alternative strategies for the treatment of breast cancer. His research is focused on preventing the growth of precancerous lesions before they become malignant tumours.



## Accelerating Neuroscience Drug Discovery: Dr. Barry Greenberg

Dr. Barry Greenberg joined TWRI as the Director of Neuroscience Drug Discovery and Development. He will work to enhance drug development capacity by establishing an integrated platform across the research institutes and clinical programs to promote the discovery and development of new therapeutic compounds.



His background in the pharmaceutical and biotechnology sectors will help identify and develop alliances with external collaborators and industrial partners. Dr. Greenberg will work collaboratively with UHN's Technology Development and Commercialization office to develop all private sector contractual relationships.

## Dr. Shannon Dunn Joins TGRI

UHN welcomed Dr. Shannon Dunn to the Toronto General Research Institute, Division of Cellular and Molecular Biology. Shannon joined UHN from California where she spent a number of years at Stanford University studying Multiple Sclerosis (MS) in Dr. Lawrence Steinman's lab.



Her research at TGRI will focus on sex differences in autoimmune diseases. Her studies will expand upon her discovery that Peroxisome Proliferator-Activated Receptor alpha (PPARalpha) is expressed at higher levels in male versus female T cells. Her work has revealed that the expression of this protein is sensitive to the levels of male sex hormones and that PPARalpha has an inhibitory effect on the development of EAE, a mouse model of MS.

## UHN Welcomes Dr. Anna Gagliardi

Dr. Gagliardi's research employs qualitative and quantitative methods to explore factors influencing the effective organization and delivery of cancer



Program leader Dr. Paige will use \$7.56M in awarded funds to investigate the project entitled "Molecular and Cellular Differentiation: New Targets and Treatments". Team members include Drs. [Norman Iscove](#), [John Dick](#), [Benjamin Neel](#), [Robert Rottapel](#), [Tak Mak](#), [Pamela Ohashi](#), and Juan Carlos Zuniga-Pflucker.

## October

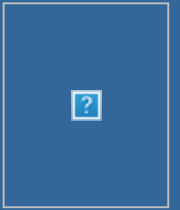
**New California Partnership Spurs Stem Cell Research:** Two multidisciplinary cancer stem cell projects led by UHN researchers Drs. [John Dick](#), [Tak Mak](#) and investigators in California, have been awarded funding through the Collaborative Partnership Program with The California Institute for Regenerative Medicine (CIRM). The two Canada-California collaborative projects on cancer stem cells were selected from 31 applications that targeted a broad range of diseases and injury.

Led by Dr. Dick and the University of California, San Diego's (UCSD) Dr. Dennis Carson, one project will focus research efforts on the development of novel drugs to treat leukemia. Dr. Mak and Dr. Dennis Slamon at the University of California, Los Angeles (UCLA) will use a pipeline strategy in the other project to develop new drugs targeting cancer-initiating cells in solid tumour cancers.

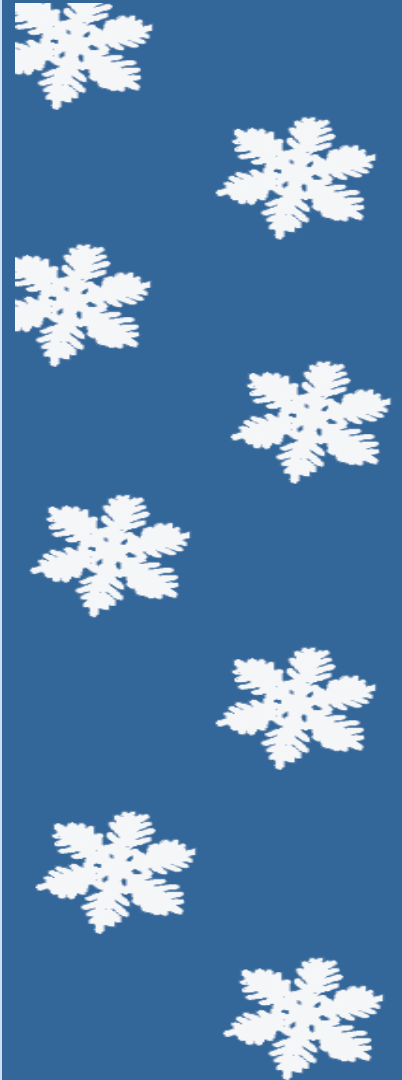
Each Canadian team has requested close to \$20M over four years, with their Californian partners requesting similar levels of funding from CIRM. Funding for the Canadian scientists is being provided by the Canadian Institutes of Health Research and Genome Canada.



services, and the design and implementation of strategies to optimize quality of care. Her laboratory's work attempts to find ways to improve the quality of care cancer that patients receive by evaluating practices at all levels of the organizational structure, including the practice of health care professionals.



Dr. Gagliardi completed her PhD in Health Policy Management and Evaluation at the University of Toronto where she is Assistant Professor in the Departments of Surgery and Health Policy, Management and Evaluation in the Faculty of Medicine.



[Feedback/To Unsubscribe](#)

Happy Holidays! *Net Results EXPRESS* is brought to you by UHN Research Communications. We hope you have enjoyed receiving this message. If you have any feedback, or if you wish to unsubscribe, please email [kkarakas@uhnresearch.ca](mailto:kkarakas@uhnresearch.ca).