



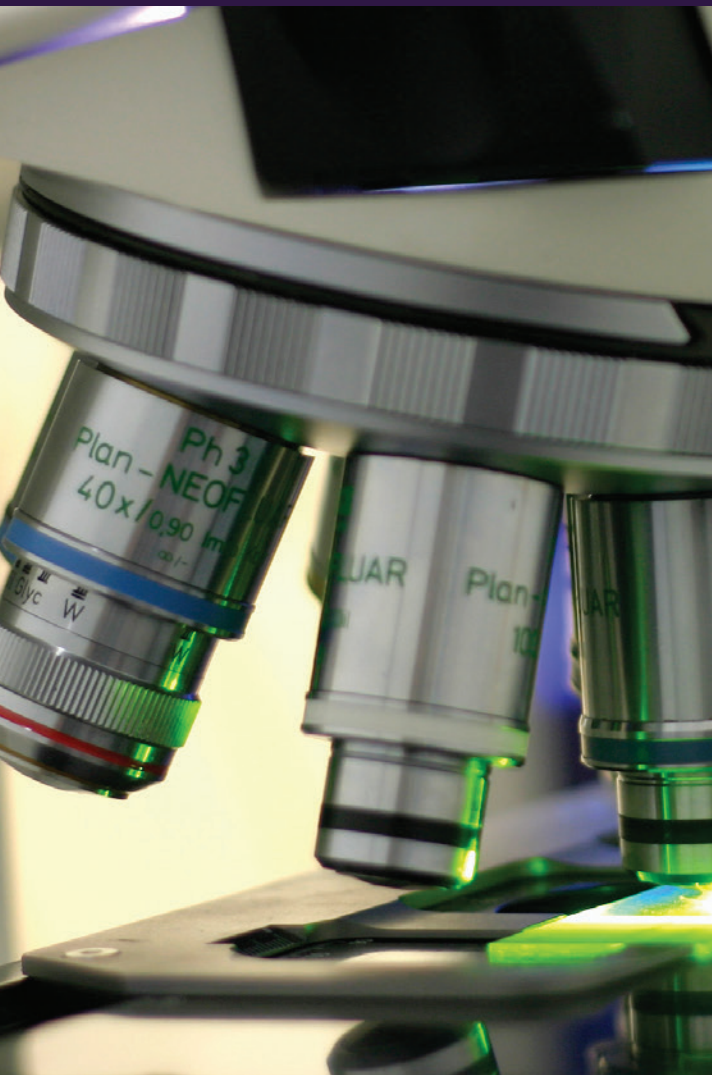
RESEARCH AND INNOVATION

Faculty of Medicine | Research Office
ANNUAL REPORT 2015-2016



uOttawa

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Research and Innovation, Faculty of Medicine

Annual Report 2015-2016

I am pleased to present the 2015-2016 Research Office Annual Report for the Faculty of Medicine where you will discover the vast array of research initiatives taking place and highlights from the past year. The 2015/2016 academic year resulted in significant achievements, opportunities, and continued growth for our major, broad-based research initiatives which focus on the brain and mind; cardiovascular/vascular science; epidemiology, public health, preventive medicine; and immunology, infection and inflammation. Major recruitment efforts continue to build our capacity in these areas of priority, capitalizing on emerging opportunities and increasing integration with our research institute partners while also promoting interactions across clinical and non-clinical departments. These invaluable partnerships throughout the Faculty of Medicine allow us to attract the best and the brightest candidates from around the world. Together, our collective vision has allowed for greater optimization of human and operational resources as well as better infrastructure planning and support. To match this unprecedented growth, further expansion of our campus to the Peter Morand buildings will accommodate the new School of Epidemiology, Public Health and Preventive Medicine (SEPHPM), the Department of Innovation in Medical Education, and the Office of Internationalization while on-going construction within the Roger Guindon building will provide much needed state-of-the-art space for wet lab-based research and expansion of core facilities (a total of 3000m²).

Our dedicated Faculty members, leadership, and trainees have many reasons to be proud. The Faculty of Medicine ranks among the nation's best for Research Excellence, a key element of the University of Ottawa's strategic plan, Destination 2020. Impressively, the University of Ottawa ranks #1 in Canada over a fifteen year period in the Medical/Doctoral University category for Research Publication Growth from 2000-2014 (Anniversary spotlight, Research Infosource Top 50) and ranks # 2 for research intensity in receiving Medical/Science grants in Canada (Maclean's 2017). The Faculty of Medicine continues to attract approximately 50% of all external research funds received by the University, making us the most research-intensive Faculty at the University of Ottawa. As we continue to work hard at this level, it allows us to lead the way in developing novel and integrated research initiatives spanning multiple sectors.

In addition to Research Excellence, Internationalization is a major priority for uOttawa's strategic plan. At that level, the Faculty also shines. Our international presence is highly recognized and our cutting-edge research is paving the way for future partnerships based on a preferred model with targeted investments. Our partnership with the Jiao Tong University School of Medicine in Shanghai dates back to 2011, with the creation of a joint research program in medical sciences and education, which ultimately led to the establishment of a joint School of Medicine in Shanghai. The Ottawa-Shanghai Joint School of Medicine (OSJSM) was officially launched in 2014. Through this joint school of medicine and with direct interactions with Shanghai hospitals, translational research and opportunities for Ottawa-based researchers in clinical and laboratory settings are greatly enhanced.

Together, we can look back on what we have accomplished in 2015-2016 as well as our collective achievements of the past decade with a tremendous sense of pride. I look forward to another successful year in 2016-2017 with significant growth and advances in research for the Faculty of Medicine and our partners, along with the excitement in Ottawa as we celebrate **Canada's 150th Anniversary**.



Bernard J. Jasmin, PhD
Vice Dean Research
Faculty of Medicine



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Goals of the Research Office

1

Continue increasing the capacity of the Research Office to support and interact efficiently with all stakeholders including basic and clinical scientists and trainees within the Faculty of Medicine, University and broader scientific community

2

Provide leadership in establishing and promoting the growth of key strategic priorities and international partnerships

3

Actively promote interdisciplinary research activities within the Faculty of Medicine and across other Faculties

4

Lead and operationalize the integrated HR plan for the recruitment of tenure-track professors across Departments and Research Institutes

5

Support submission of applications for Canada Research Chairs and Canada Foundation for Innovation grants (both Innovation Fund and John R. Evans Leaders Fund)

6

Manage and coordinate capital expansion and renovation

7

Enhance the visibility of ongoing research initiatives while promoting scientific accomplishments

8

Provide support and mentoring for new Faculty members in order to ensure a smooth transition to the Faculty of Medicine, the rapid and successful establishment of their research laboratories, and their competitiveness with funding expectations

9

Continue building functional partnerships and develop specific initiatives between the Faculty of Medicine, our Basic and Clinical Departments, other Faculties and hospital-based research institutes

10

Maintain transparent, fair, efficient and comprehensive procedures to prioritize resource allocation according to strategic goals and priorities



Our Departments and Partners

Basic Science Departments

- Biochemistry, Microbiology and Immunology
- Cellular and Molecular Medicine
- Epidemiology and Community Medicine
- Innovation in Medical Education

Clinical Departments

- Anesthesia
- Emergency Medicine
- Family Medicine
- Medicine
- Obstetrics and Gynecology
- Ophthalmology
- Otolaryngology
- Pathology and Laboratory Medicine
- Pediatrics
- Psychiatry
- Radiology
- Surgery

Affiliated Hospital-Based Research Institutes

- Children's Hospital of Eastern Ontario Research Institute
- Bruyère Research Institute
- Institut de recherche de l'Hôpital Montfort
- Ottawa Hospital Research Institute
- University of Ottawa Heart Institute
- University of Ottawa Institute of Mental Health Research

Research Centres and Institutes

- Canadian Partnership for Stroke Recovery
- Centre for Neural Dynamics
- Centre for Neuromuscular Disease
- Kidney Research Centre
- The Ottawa Institute of Systems Biology
- University of Ottawa Brain and Mind Research Institute
- University of Ottawa Eye Institute

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Research Priorities of the Faculty

STRATEGIC, BROAD-BASED RESEARCH INITIATIVES

The Faculty of Medicine has a number of major research initiatives that are completely aligned with the University's strategic plan, Destination 2020. Building on our demonstrated track-record of research excellence, the Faculty and our affiliated Hospital-Based Research Institute partners will focus our efforts during the coming decade on the following integrated strategic areas.



The University of Ottawa Brain and Mind Research Institute

The University of Ottawa Brain and Mind Research Institute (uOBMRI) continues major growth and development. In the past several years, we have recruited 22 exceptional investigators in brain related research. The Institute brings basic and clinical investigators from a broad spectrum of disciplines under a unifying umbrella to provide leadership and focus for the enhancement of neuroscientific and behavioral research. The Institute's initial programs focused on development of exceptional clinical care and research of brain-related illnesses in stroke, Parkinson's disease, depression and neuromuscular disease. These initiative cut across basic, clinical and human population studies, emphasizing translation of research into practice, particularly in the development of novel therapeutics and diagnostics. In the past year, we have also initiated efforts in emerging areas: understanding concussion injury and cognitive memory processes.



Cardiovascular and Vascular Biology

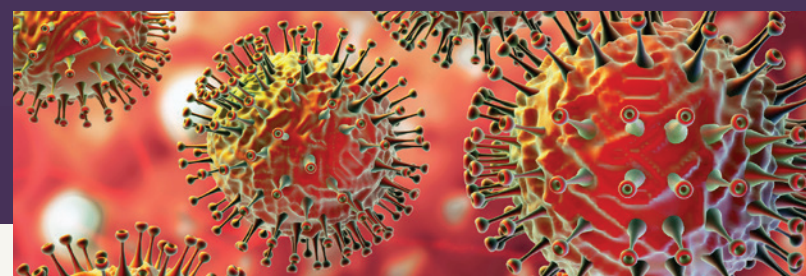
The Faculty of Medicine, together with the University of Ottawa Heart Institute (UOHI) and Ottawa Hospital Research Institute (OHRI), has had a strong track record of research excellence in cardiovascular disease and vascular biology. In recent years there has been a concerted effort to develop a multi-disciplinary and inter-institutional initiative. The 2013-17 Ottawa Region for Advanced Cardiovascular Research Excellence (ORACLE) strategy was developed by Dr. Peter Liu (CSO, UOHI), in collaboration with the Faculty of Medicine, and has additional participation from regional Institutes. The vision for the five year strategy is that UOHI, the Faculty of Medicine and regional partners become Canadian leaders in cardiovascular innovation and knowledge translation. Key successes of the strategy include the formation of regional teams of multi-disciplinary researchers known as Innovation Clusters; basic Scientist recruits in regenerative medicine, imaging probes and metabolomics; the creation of a cardiovascular Biobank; development of the Ottawa Health Sciences Research Ethics Board; acquisition of major research infrastructure; and international symposia (including the Ottawa International Heart Conference). In the coming year, ORACLE 2.0 strategic planning sessions will solicit input from all stakeholders to develop the necessary vision and strategies to ensure our regional cardiovascular research becomes recognized among the top international hubs.



School of Epidemiology, Public Health and Preventive Medicine

The School of Epidemiology, Public Health and Preventive Medicine came into being on January 1, 2015. SEPHPM builds on the recognition in the Strategic Mandate Agreement that research and graduate education in applied health and knowledge translation are areas of strength in the Faculty of Medicine and its partners, including the affiliated, hospital-based research institutes, and that the University recognizes applied health research as a priority. The vision of the School is to be recognized as a leading contributor to research, teaching and professional training. At the local level it aims to improve patient and population health outcomes in the population laboratory of the Champlain Local Health Integration Network (LHIN), Ontario, Canada. More broadly it carries out research on the determinants of health and disease etiology and on the development, implementation and evaluation of practices, programs and policies aimed to optimize health and social services.

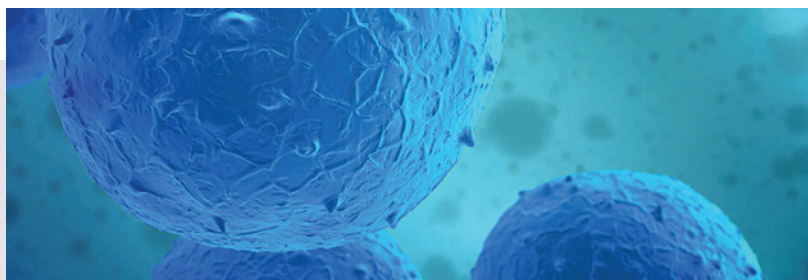
The School aims to bring together virtually applied health researchers from within the Faculty of Medicine, research institutes, and other groups into one collective with agreed upon research strategic priorities and research enabling platforms (e.g., methods center, large administrative database centre, biobanking, centre for microbial diversity, assessment facilities). It will harness the collective power of researchers in the region and promote interdisciplinary, collaborative, patient-centered applied health and public health research. The methodologies used and developed by the researchers include epidemiology, biostatistics and other quantitative evaluative sciences; methods that include complementary quantitative and qualitative approaches; health economics; policy development approaches; and engaged scholarship/knowledge translation.



Centre for Infection, Immunity and Inflammation (CI³)

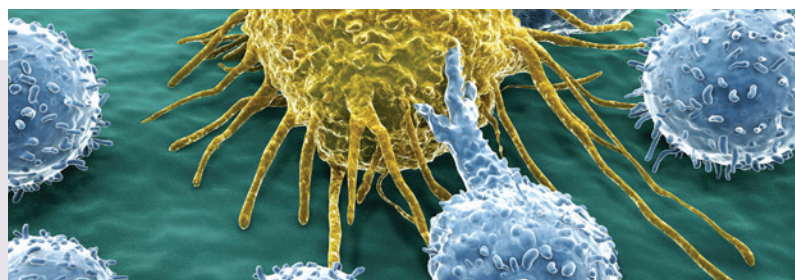
Chronic infectious and inflammatory diseases are highly complex, involving multi-faceted gene-environment interactions and substantial cross-talk between different biological systems such as the cardiovascular, immune, neurological and endocrine systems. Unravelling this complexity requires a systems biology approach, and must encompass the expertise of scientists from diverse disciplines working together on a given disease. The uOttawa Centre for Infection, Immunity and Inflammation (CI³) was created with the objective of bringing together basic and clinical scientists from across the fields of Immunology, Microbiology, Virology, Biochemistry, Neurobiology, Cardiovascular Biology, Metabolism and Pathology, who have diverse expertise, experimental models and approaches, and are interested in the development of effective solutions for infectious and inflammatory diseases. The overarching goal of CI³ is to foster multidisciplinary research across the field of infectious and inflammatory disease in order to accelerate understanding of the common principles and help establish the mechanisms that underpin chronic inflammatory states, and therefore lead us towards development of intervention strategies. The objectives of the centre are to: 1) develop new collaborative, innovative and multi-disciplinary research projects that are aimed at understanding the mechanisms of inflammation that underline various chronic diseases, 2) to develop collaborative projects that are aimed at knowledge translation and dissemination, and 3) to train next the generation of scientists in multidisciplinary research in infection, immunity and inflammation.

Outstanding Research Accomplishments



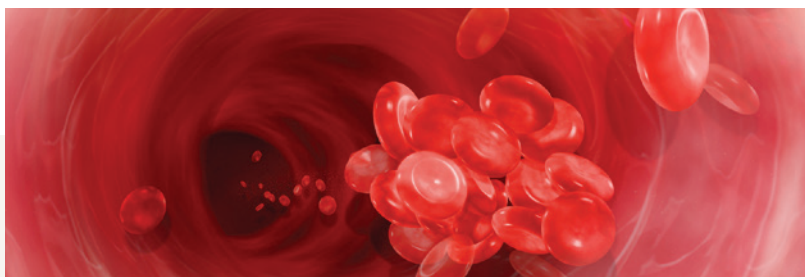
Stem Cell Transplantation Halts Multiple Sclerosis

Multiple sclerosis is a debilitating neurological condition and those afflicted with this illness face recurrent episodes of disability that come and go (relapses and remissions) as well as the prospect of significant and progressive permanent disabilities that can impair their abilities'. The damage to the nervous system is caused by the immune system, which mistakenly recognizes the brain as "foreign". In a 2016 paper published in *The Lancet*, **Dr Harold Atkins, Scientist Cancer Therapeutics and Medical Director, Regenerative Medicine at the OHRI, Attending Physician Blood Bone Marrow Transplant Program at the Ottawa Hospital and Associate Professor in the Department of Medicine and Dr. Mark Freedman, Senior Scientist Neuroscience Program at the OHRI, Director Multiple Sclerosis Research Unit, Neurology at the Ottawa Hospital and Professor in the Department of Medicine**, have shown that strong doses of chemotherapy can eliminate the misguided immune system and regenerate a new immune system following a blood stem cell transplant. Together these treatments halt all evidence of ongoing immune mediated damage in patients with multiple sclerosis and prevent progressive permanent disabilities in 70% of patients. In the absence of ongoing immune mediated damage, the nervous system can repair itself and about 40% of patients at least partially recover from previous longstanding disabilities. Ongoing use of this procedure continues to help that subset of patients that present with the most aggressive multiple sclerosis.



Designing Viruses to Kill Cancer Cells

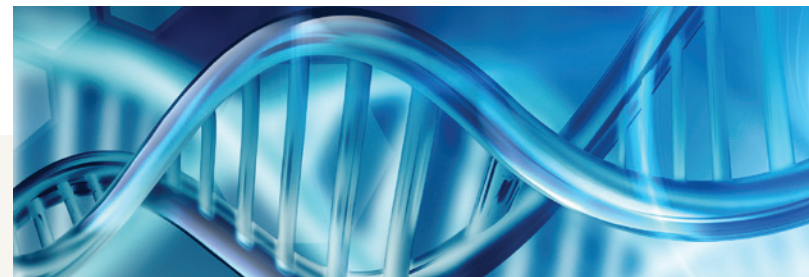
Cancers arise within our bodies because of genetic changes that occur during our lifetimes in a relatively small number of cells. These so-called "cancer cells" interact with the normal tissues of our body and using a variety of strategies trick "normal cells" into creating a new disorganized or malignant tissue which is commonly referred to as a tumour. Indeed there is a back and forth communication between the normal and cancer cells within a tumour which influences how well the tumour hides from the immune system, how rapidly it can grow and how effectively it can resist cancer therapy. A study led by **Dr. John Bell, Senior Scientist Cancer Therapeutics Program at the OHRI, Program Director Ontario Regional Biotherapeutics, Director Canadian Oncolytic Virus Consortium, Terry Fox New Frontiers Program Project Grant, Scientific Director, BioCanRx Biotherapeutics for Cancer Treatment and Professor in the Departments of Medicine and Biochemistry, Microbiology and Immunology**, and published in *Nature Medicine* deciphered the communication between normal and cancer cells within pancreatic tumours and discovered signals that predict if the cancer can be treated with innovative cancer killing viruses that the group are developing. This discovery also provided insights into how to better design viruses that specifically kill pancreatic tumours.



Less Is More in Detecting Cancer for Patients with Blood Clots

People with cancer are more susceptible to blood clots in the veins (venous thrombosis). In some cases, a blood clot with no apparent risk factors (unprovoked) can be the first sign of cancer. Conducting tests to identify whether a patient with unprovoked thrombosis has an underlying cancer is appealing for physicians and common in clinical practice. However, it is unknown if more screening lead to an earlier cancer diagnosis and earlier treatment.

In a study published in the *New England Journal of Medicine*, a team led by **Dr. Marc Carrier, Senior Scientist at the Ottawa Hospital Research Institute (OHRI), Director of the Thrombosis Fellowship Program, and Associate Professor at the Department of Medicine**, compared two strategies for detecting cancer in patients with unprovoked blood clots to determine how many cases of cancer are discovered using both of these strategies – one strategy was more extensive and involved a CT scan of the abdomen and pelvis while the other strategy was simpler and only included physical examination and basic blood work. The results of this study showed that routine screening with CT scan of the abdomen/pelvis does not lead to fewer missed cancers when compared to a limited screening strategy and that this method of screening does not appear to detect significantly more underlying cancers. These results could lead to major cost savings for the Canadian health-care system by reducing the number of CT Scans performed to detect underlying cancer.

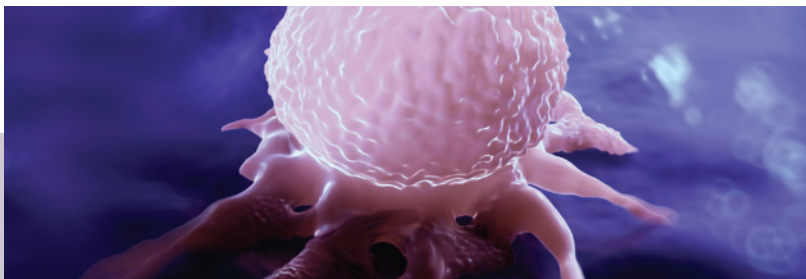


Novel Insights into the Genetic Architecture of Coronary Artery Disease

Researchers from the University of Ottawa Heart Institute (UOHI), together with teams at Oxford University and the Broad Institute, have found the answer to an ongoing debate in the cardiovascular scientific world. **Dr. Ruth McPherson Director of the Ruddy Canadian Cardiovascular Genetics Centre, Atherogenomics Laboratory and the Lipid Clinic, Cardiologist at the University of Ottawa Heart Institute, Professor in the Departments of Medicine and Biochemistry and Dr. Majid Nikpay, Post-Doctoral Fellow at the University of Ottawa Heart Institute**, report that the genetic basis of heart disease is largely derived from the cumulative effect of multiple common genetic variants, rather than from a few rare variants with large effects.

The study, published in *Nature Genetics*, used the data from the 1000 Genomes project in order to obtain information on close to 10 million genetic variants (called SNPs). The analysis involved 60,000 heart disease patients, 120,000 healthy individuals, from a total of 48 studies around the world. Not only is the number of genetic variants much greater than the approximately 1 million previously studied, this is the first time that researchers have been able to study the link of rare genetic variants present in as few as 1 in 1000 people at risk of heart disease.

“Our analysis provides a comprehensive survey of the fine genetic architecture of coronary artery disease (CAD), showing that genetic susceptibility to this common disease is largely determined by common SNPs of small effect size rather than just a few rare variants with large effects,” say the authors of this important study. This research team has produced a list of 202 genetic variants in 129 gene regions that together explain approximately 22% of the heritability of coronary heart disease as compared to only 11% reported in previous studies.



Discovery Could Reduce the Need for Preventive Mastectomy in BRCA1-mutated Breast Cancer

One in nine Canadian women is expected to develop breast cancer throughout her lifetime, and one in 30 will die from it. Preventing breast cancer at the cellular level, however, may be a possibility, after research published in *Cell Stem Cell* by **Dr. Christine Pratt Associate Professor in the Department of Cellular and Molecular Medicine** uncovered why breast cells with the BRCA1 gene mutation are at high risk for evolving into tumours. When a woman inherits a mutation of the BRCA1 gene, the gene may not be able to repair faulty DNA, increasing the risk of genetic mutations and cancer. During a monthly cycle in humans, stem cells within the breast undergo a phase called proliferation, where cells rapidly multiply in response to the hormone progesterone. Dr. Pratt and her team have discovered that if these cells lack BRCA1, they accumulate DNA damage as they multiply, which triggers NF- κ B, a protein complex normally involved in the proliferation of immune cells. "The activation of NF- κ B leads to increased cell proliferation that no longer requires progesterone, resulting in even more DNA damage which can lead to cancer," says Pratt. "In cells with a BRCA1 mutation, the DNA cannot be properly repaired. Importantly, evidence suggests that other forms of familial breast cancer are also associated with mutations in different DNA repair proteins. Therefore this response to DNA damage in breast cells may be a common mechanism underlying the development of breast cancer". The finding that NF- κ B is pivotal to the development of breast cancer in BRCA1 mutation carriers opens the door for prevention therapies targeting the NF- κ B protein.



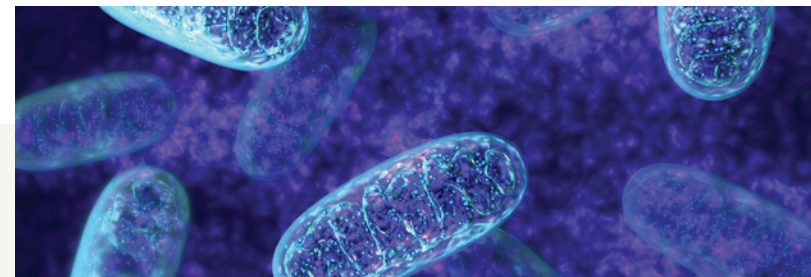
Researchers Discover that Duchenne Muscular Dystrophy is a Stem Cell Disease

Dr. Michael Rudnicki is a Professor in the Departments of Medicine and Cellular and Molecular Medicine and Director and Senior Scientist of the Regenerative Medicine Program at the Ottawa Hospital Research Institute. A new study from Dr. Rudnicki's group is poised to completely change our understanding of Duchenne muscular dystrophy and pave the way for far more effective treatments. The study, published in *Nature Medicine*, is the first to show that Duchenne muscular dystrophy directly affects muscle stem cells. "For nearly 20 years, we've thought that the muscle weakness observed in patients with Duchenne muscular dystrophy is primarily due to problems in their muscle fibres, but our research shows that it is also due to intrinsic defects in the function of their muscle stem cells," said Dr. Rudnicki. Duchenne muscular dystrophy is the most common form of muscular dystrophy, affecting approximately one in 3,600 boys. It is caused by genetic mutations that result in the loss of the dystrophin protein, leading to progressive muscle weakness and death by the second or third decade of life.



Who Let the FoxO Out?

Forkhead box O (FoxO) transcription factors have been identified to function as a molecular link between ageing and tumor suppression. In mammals, there are four separate FoxO genes (FoxO1, FoxO3, FoxO4 and FoxO6). Genetic variation within the FoxO3a gene has been shown to strongly impact human longevity, and inactivation of FoxO3a gene has been shown to correlate with the development of acute myeloid leukemia in humans. In a recent *Nature Communications* article, **Dr. Subash Sad's** group (**Department of Biochemistry, Microbiology and Immunology**) has revealed that FoxO3a signaling promotes host survival during infection with a chronic, virulent pathogen. They have shown that FoxO3a signaling promotes host survival by engaging two key mechanisms: 1) FoxO3a promotes expression of genes that are involved in detoxification of reactive oxygen species and DNA repair, 2) FoxO3a signaling induces termination of mitogen activated protein kinase, ERK, signaling, which results in maintenance of a pro-inflammatory state that is necessary for control of virulent pathogens. The authors concluded that modulation of the toxic reactive oxygen species load and the anti-inflammatory signaling, FoxO3a tilts the balance towards increased inflammatory responses which results in host survival.



Mitochondria Regulate Stem Cells in the Brain

Extensive evidence now reveals that adult neural stem and progenitor cells, which support the generation and integration of newborn neurons into adult hippocampus, play an important role in cognitive function. The continuous generation of neurons in the adult brain requires a sustained population of stem cells, which relies on a regulated balance of cell fate decisions. Thus understanding the regulation of stem cell maintenance is key to preventing stem cell depletion in neurodegenerative diseases and aging. Recently, **Dr. Ruth Slack** from the **Department of Cellular and Molecular Medicine and University of Ottawa's Brain and Mind Research Institute (uOBMRI)**, have made an important discovery that uncovers a major role for mitochondria in the regulation of stem cell fate decisions, which was published in *Cell Stem Cell*. They have discovered a novel signaling pathway, whereby changes in mitochondrial structure or function can signal directly to the nucleus, to direct neural stem cell fate decisions, having a major impact on neural stem cell longevity, neurogenesis and cognitive function. These findings have important implications in our understanding and treatment of neurological deficits associated with aging, stroke and neurodegenerative diseases, where mitochondrial dysfunction is integral to disease progression.



Predicting Recovery Following Concussion

One-third of children with concussion have ongoing physical, thinking, emotional or behavioral symptoms beyond one month, known as persistent post-concussion symptoms (PPCS). PPCS may result in missed school, depressed mood, and lower quality of life. In a 2016 paper published in *JAMA*, **Dr. Roger Zemek, Scientist at CHEO Research Institute and Associate Professor in the Departments of Pediatrics and Emergency Medicine**, and his team developed a PPCS risk score that was significantly better than the child's physician at predicting future PPCS. The score incorporates nine clinical variables containing information from demographics, past medical history, initial signs and symptoms, and physical examination. Clinicians are now able to provide accurate information to patients and families regarding the expected recovery, and researchers may target children at high risk for PPCS in new trials with the goal of preventing PPCS.

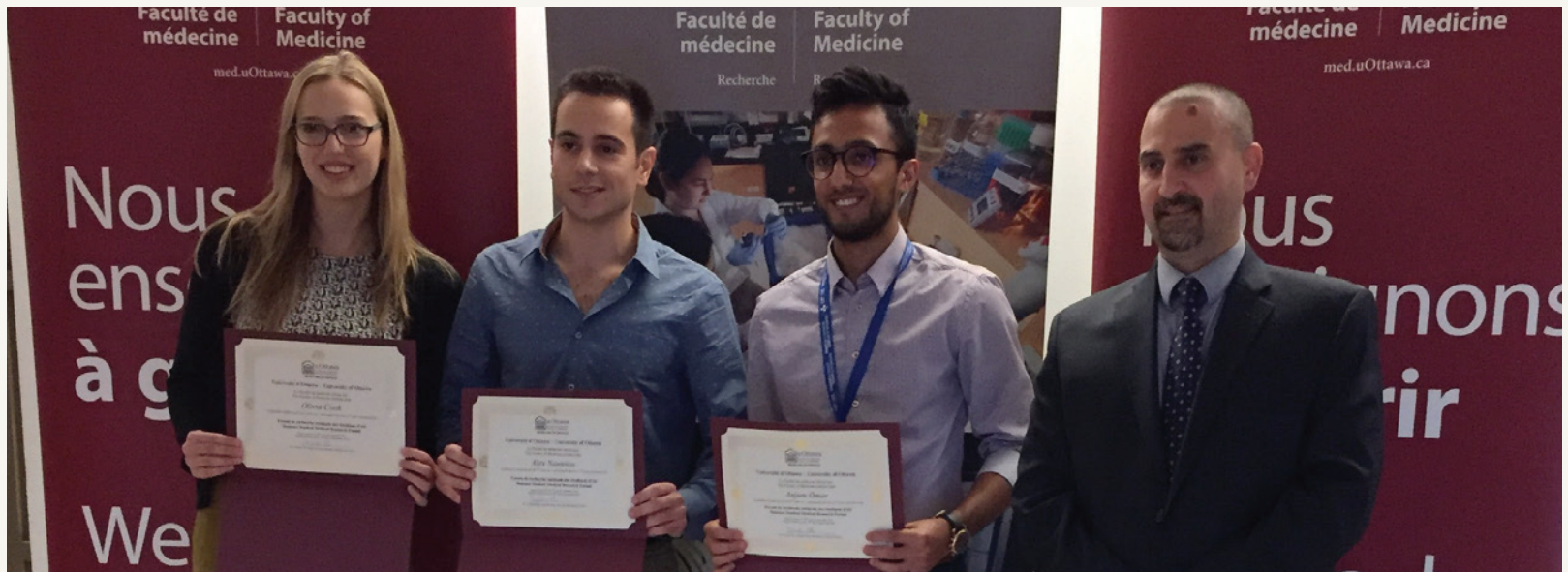


Summer Studentship Program 2016

The Faculty of Medicine Research Office Summer Studentship Program is offered to students enrolled in their first or second year of training. We are pleased to offer fifty \$5,000 bursaries to students who are selected to participate. Students then spend the summer working closely with their supervisor on a specific research project followed by a poster presentation of their work in September. Winners of the poster session then go on to present once more at the Canadian National Medical Student Research Symposium in Winnipeg.

This year's winners are:

1st place:	Alex Nantsios	Supervisor: Dr. Darryl Davis	Project: Validation of Microfluidic Encapsulation of Cardiac Stem cells for Myocardial Repair
2nd place:	Olivia Cook	Supervisor: Dr. Venkatesh Thiruganasambandamoorthy	Project: Application and Usefulness of Holter Monitoring among Emergency Department Patients with Syncope
3rd place:	Omar Anjum	Supervisor: Dr. Pil Joo	Project: Retrospective Study of Rapid-Strep Test's Impact on ER Practice
4th place:	Jennifer Zlepniq	Supervisor: Dr. Lauralyn McIntyre	Project: Safety and Efficacy of Adult Stem Cell Therapy for Acute Myocardial Infarction and Critical Illness-A Systematic Review



From left to right: Olivia Cook, Alex Nantsios, Omar Anjum and Dr. Jocelyn Côté



Core Facilities

The Faculty of Medicine, with support from affiliated hospital-based research institutes and the University of Ottawa, has successfully developed a series of cutting-edge core facilities which bring together state-of-the-art equipment, instrumentation, methodologies and expertise crucial to the success of basic and clinical research activities. These facilities are accessible to all researchers across the University of Ottawa as well as to outside communities on a fee-for-service basis. To date, 13 cores have been established and a few others are in the planning stages. For each facility, director and user committees have been appointed to ensure accountability and optimal use for the continued commitment and success of our expanding core facilities.

Animal Behavior: **Dr. Diane Lagacé**

Bioinformatics: **Dr. Theodore Perkins, Dr. Ilya Ioshikhes**

Cell Biology and Image Acquisition: **Dr. John Copeland**

Common Equipment and Technical Expertise: **Dr. Jean-François Couture**

Containment Level 3: **Dr. Bernard Jasmin**

Flow Cytometry: **Dr. Marc-André Langlois**

Transgenic: **Dr. David Lohnes**

Genomics (StemCore): **Dr. Michael Rudnicki**

Proteomics (StemCore): **Dr. Marjorie Brand**

Human Pluripotent Stem Cells: **Dr. William Stanford**

Histology: **Dr. John Veinot**

Preclinical Imaging: **Dr. Frank J. Rybicki**

Proteomics: **Dr. Daniel Figeys**

For more information, please visit med.uottawa.ca/research/corelabs

Research Office Events

New Professor Seminar Series

Dr. Jodi Warman, Assistant Professor, Department of Medicine

Dr. Jodi Warman (Medicine) gave a talk entitled “MYO-CARE CANADA: A diagnostic and discovery pipeline transforming care for patients with genetic myopathies” as part of the New Professor Seminar Series. Her research program focuses on identifying the molecular basis and clinical characterization of rare myopathies using next generation sequencing (NGS). Together with colleagues, she has identified several novel genes, including a novel limb girdle muscular dystrophy gene (LIMS2). Her independent research program will continue to assess exome, clinome and RNA sequencing as clinical tools to help patients living with neuromuscular disease. Dr. Warman received her MD/Neurology residency at the University of Ottawa and MSc from Queen's University. She completed research and clinical fellowships in neuromuscular disorders from McGill University and University of Ottawa. She is certified by the Canadian Society of Clinical Neurophysiologists (EMG).



Dr. Woo Jae Kim, Assistant Professor, Department of Cellular and Molecular Medicine

The Kim lab seeks to understand the fundamental mechanisms of how specific neural circuits lead to certain behaviors, using the tiny insect *Drosophila melanogaster* (fruit fly) to answer this question. Dr. Kim has established two behavioral paradigm called 'Longer-Mating-Duration' and 'Shorter-Mating-Duration'. With the advantage of strong genetic tools available in fruit fly, and established behavioral quantification and manipulation systems, in the long term the Kim lab seeks to understand how neural circuits for complex social behavior function in vivo.



Research Office Major Events

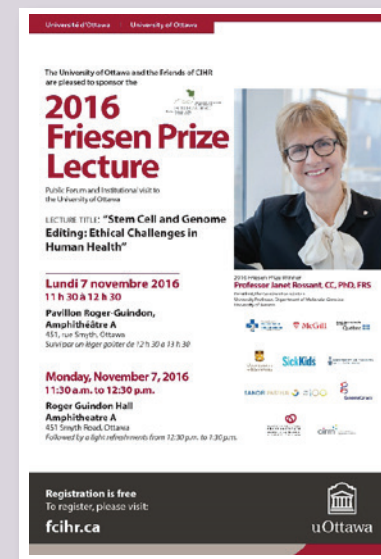
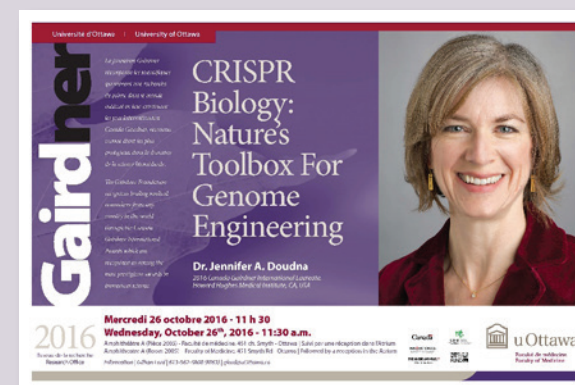
Distinguished Lectures

Gairdner Global Health

The Faculty of Medicine was proud to host the 2016 Canada Gairdner Global Health Award winner, Dr. Jennifer Doudna, as part of the Gardiner seminar series in October. Dr. Doudna is the Li Ka Shing Chancellor's Chair in Biomedical and Health Sciences and she is Professor of Molecular and Cell Biology and Professor of Chemistry at UC Berkeley and an Investigator of the Howard Hughes Medical Institute. Prof. Doudna's research seeks to understand how RNA molecules control the expression of genetic information in cells. Her research led to insights about CRISPR-Cas9-mediated bacterial immunity that enabled her lab along with collaborator Emmanuelle Charpentier to harness this system for efficient genome engineering in animals and plants, creating a transformative technology that is revolutionizing the fields of genetics, molecular biology and medicine. Dr. Doudna has been named as one of Time Magazine's 100 most influential people in the world (2015) and as one of Foreign Policy's leading global thinkers (2014). Dr. Doudna is a founder and the executive director of the Innovative Genomics Institute at UC Berkeley and UC San Francisco. The Gardiner Foundation recognizes leading medical researchers around the world through its Canada Gairdner International Awards, which are regarded as among the most prestigious awards in biomedical science.

Friesen International Prize

The Faculty of Medicine was proud to host The Henry G. Friesen International Prize in Health Research Award winner, Dr. Janet Rossant, in November. Professor. Rossant is the consummate educator and as University Professor in the Department of Molecular Genetics at the University of Toronto, she supervised dozens of graduate and postgraduate students, who now populate many senior academic and administrative positions in Canada and abroad. As a public advocate, she has played a leading role in setting public policy regarding stem cell research. Her expertise in stem cell biology informed the scientific and ethical debate surrounding cloning and human embryonic stem cell research in Canada and the US. Dr. Rossant also had a major role in establishing guidelines for human embryonic stem cell research in Canada and beyond. Dr. Rossant has received many distinctions including 4 Honorary Degrees, Fellowships in the Royal Society of London and Canada, 15 major national and international prizes, including Companion of the Order of Canada, the Michael Smith Prize, the Killam Prize and the Canada Gairdner Wightman Award. The Friesen Prize, established in 2005 by the Friends of Canadian Institutes of Health Research (FCIHR) recognizes exceptional innovation by a visionary health leader of international stature.





International Collaborations

The Faculty of Medicine and the Shanghai Jiao Tong University School of Medicine (SJTUSM) signed a blueprint memorandum on October 18, 2013, which laid the anchor for a partnership in medical education and research between the two institutions and their affiliated teaching hospitals. On October 28, 2014, the Faculty of Medicine, the Children's Hospital of Eastern Ontario (CHEO), and Shanghai Xinhua Hospital which is affiliated with the SJTUSM, signed a further MOU with the overarching goal to create a leading international clinical research unit.

Since then, bilateral collaborations in clinical research have been gaining momentum. In 2015, the Faculty of Medicine established a Joint Clinical Research Steering Committee, chaired by Dr. Jasmin. The committee consists of Departmental Chairs and Research Institute Directors. A collective decision was made to create, with Xinhua Hospital, its very first Clinical Research Unit which will also serve joint research projects via the signed partnership. Leading investigators from both sides have been identified for promoting joint research projects, and regular two-way meetings will soon be held to enhance interactions and better support discussions on future directions for this partnership.

Encouragingly, this partnership has recently expanded to also encompass many other opportunities and initiatives for international collaboration between Professors and trainees from the two Universities and affiliated teaching hospitals. In particular, the Ottawa Hospital, the Children's Hospital of Eastern Ontario (CHEO), and the Hôpital Montfort have already signed MOUs with hospitals in Shanghai including Renji, Xinhua and Ruijin Hospitals, respectively, to collaborate for improving patient care and clinical research.

University of Ottawa / Shanghai Institute of Materia Medica (SIMM)

In November 2011, the University of Ottawa and SIMM established a formal agreement to develop a joint laboratory in mass spectrometry/proteomics encouraging the mobility of professors and graduate students. The two institutions will establish a scientific committee of eminent scientists

from the University of Ottawa and SIMM to explore further development and to build an international collaborative team.

University of Ottawa / The Shanghai Institutes for Biological Sciences (SIBS)

In November 2011, the University of Ottawa and SIBS partnered to promote collaborative links between our two institutions in systems

biology. This will go a long way in promoting the exchange of professors and graduate students to:

- Organize a symposium on systems biology to be held at uOttawa and at SIBS on a rotating basis
- Invite researchers from both institutions for short stays or for complete sabbaticals to develop collaborative projects or to be trained in specialized techniques

- Encourage scientists to develop joint research projects and make applications to national and international funding agencies supporting work in areas of mutual interest
- Promote international research experience and training for graduate students, postdoctoral fellows and clinical staff

**University of Ottawa /
Ottawa Hospital Research Institute /
The Ottawa Hospital / Institute of Zoology /
Shanghai Institutes of Biological Sciences**

In September 2005, the University of Ottawa, the Ottawa Hospital Research Institute and the Ottawa Hospital, together with the Institute of Zoology and the Shanghai Institutes of Biological Sciences formalized a collaborative agreement for research and academic exchange in the area of reproductive biology with the goals to:

- Develop links in reproductive biology research

- Promote the exchange of research personnel to carry out joint research and academic meetings
- Develop a plan for the establishment of joint teams in reproductive health research and education so as to facilitate and intensify academic exchanges and research collaboration

University of Ottawa / Université Paris – Descartes

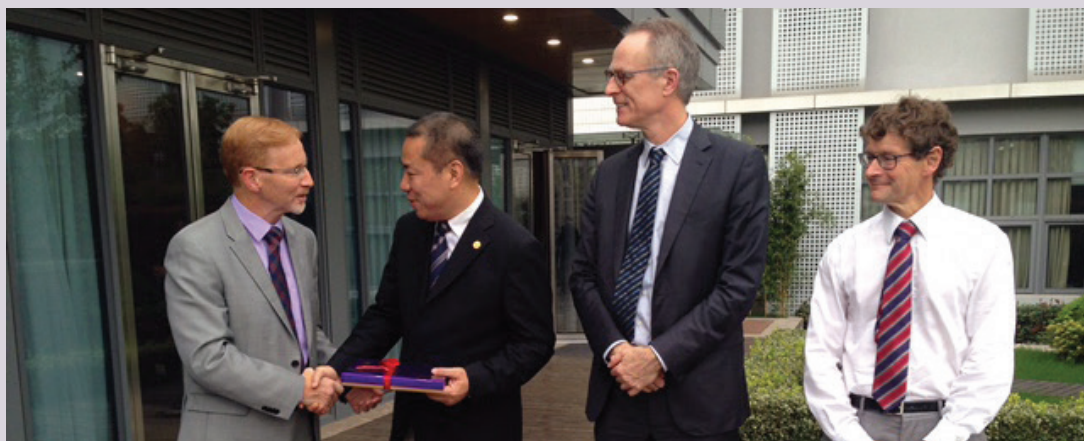
Following informal communications between both universities, several opportunities for cooperation in the area of neuroscience, a field in which informal collaborations already existed, became evident. Increased collaboration, medical leadership and the creation of a conference to bring together key players in doctoral training were all identified as areas of potential partnership. In November 2009, a five-year memorandum of understanding formalized this intent. The partnership was renewed for an additional five years in 2014.



University of Ottawa / Dalian Institute of Chemical Physics

In June 2011, the University of Ottawa and the Dalian Institute of Chemical Physics established a formal agreement to promote collaborative links in proteomics and systems biology. The joint research laboratory will have an initial focus on:

- Proteomics and systems biology technology development and application
- Clinical application of proteomic and systems biology
- Mechanistic study of traditional Chinese medicine
- Biological validation of proteomics and systems biology
- Bioinformatic software development and application



From left to right: Drs. Bernard Jasmin, Sun Kun, Phil Wells and Julian Little at Xinhua hospital





University of Ottawa / SHIGA University of Medical Science

Through the efforts of the University of Ottawa Centre for Research in Biopharmaceuticals and Biotechnology, an agreement between uOttawa and the SHIGA University of Medical Science was signed. The overall objective of this new partnership is to develop academic and scientific collaborations by initially establishing an exchange of information in programs and course offerings as well as research programs and scientific projects. Emphasis will be placed on developing links in several areas, but primarily in brain and mind sciences, cardiovascular science and medical pedagogy.

University of Ottawa Faculty of Medicine / Shanghai Jiao Tong University School of Medicine

In October 2013, the University of Ottawa and SJTU launched the Ottawa–Shanghai Joint School of Medicine, which provides joint medical training and awards the first-ever North American M.D. degree in China. In September 2015, uOttawa welcomed the first group of Chinese medical students from SJTU. In October 2015, the Joint School of Medicine opened the first Canadian-style family physician clinic in China. To support the Joint School of Medicine's on-going research activities in medicine and medical education, uOttawa and SJTU set up a significant research fund.



Université Claude Bernard Lyon 1



University of Ottawa Faculty of Medicine / Université Claude Bernard Lyon 1

The Faculty of Medicine is leading the way in the internationalization of Canadian medical research and education. Over the past year, the University of Ottawa, Université Claude Bernard Lyon 1 and the Hospices Civils de Lyon developed a cooperation agreement to support the development of stronger ties for conducting research in the biomedical sciences and to develop new joint research programs and conferences. Given the international prominence and history of research excellence of these two Universities in neuromuscular disease research, a joint collaborative research program has been launched between the University of Ottawa's Centre for Neuromuscular Disease (CNMD) and l'Université Claude Bernard Lyon 1 Institute NeuroMyoGene (INMG). This program will support collaborations between the two institutions in basic and clinical neuromuscular disease research, and will foster the development of novel collaborations and international research teams.



Current Research Chair Holders and Awards

Canada Research Chairs



Dr. Pierre Blier (2004)

Chair in Psychopharmacology

Dr. Daniel Figey's (2004)

Chair Proteomics and Systems Biology

Dr. Stephen Ferguson (2015)

Chair in Brain and Mind

Dr. Jeremy Grimshaw (2002)

Chair in Health Knowledge Transfer and Uptake

Dr. Ronald Labonté (2004)

Chair in Contemporary Globalization and Health Equity

Dr. Julian Little (2005)

Chair in Human Genome Epidemiology

Dr. Georg Northoff (2009)

Chair in Mind Brain Imaging and Neuroethics

Dr. Michael Rudnicki (2001)

Chair in Molecular Genetics

Dr. William Stanford (2011)

Chair in Integrative Stem Cell Biology

Dr. Peter Tugwell (2002)

Chair in Health Equity

Dr. Michael Wolfson (2010)

Chair in Population Health Modelling/Populomics



Dr. Ian Colman (2011)

Chair in Mental Health Epidemiology

Dr. Marceline Côté (2015)

Chair in Molecular Virology and Antiviral Therapeutics

Dr. Jean-François Couture (2008)

Chair in Structural Biology and Epigenetics

Dr. Patrick Giguère (2015)

Chair in Molecular Pharmacology and Drug Discovery

Dr. Marc-André Langlois (2010)

Chair in Molecular Virology and Intrinsic Immunity

Dr. Seung-Hwan Lee (2011)

Chair in Viral Infection and Immunity

Dr. Michael Schlossmacher (2006)

Chair in Parkinson's Diseases

University Research Chairs

Dr. David Moher

University Research Chair (2006)
Chair in Systematic Reviews

Dr. Ruth Slack

University Research Chair (2003)
Accelerating recovery after an acute
brain injury

Dr. Steffany Bennett

University Research Chair (2011)
Chair in Neurolipidomics

Dr. Beth Potter

University Research Chair (2016)
Health Services for Children with
Rare Diseases

Dr. Mary-Ellen Harper

University Research Chair (2016)
Mitochondrial Bioenergetics

Endowed and Sponsored Chairs

Dr. Robert Beanlands

Vered Chair of Cardiology

Dr. Robert Beanlands

Saul and Edna Goldfarb Chair in Cardiac
Imaging Research

Dr. Anthony Bella

Greta and John Hansen Chair Men's Health
Research

Dr. Pierre Blier

Endowed Chair of Research Mood and Anxiety
Disorders

Dr. Seymour Brownstein

Les Amis Research Chair

Dr. Ciarán Duffy

Endowed Chair Pediatrics

Dr. Dean Fergusson

OHRI/uOttawa Clinical Epidemiology Program
Endowed Chair

Dr. Lyall Higginson

Donald S Beanlands Chair Cardiology
Education

Dr. Steven Gilberg

Chair of the Eye Institute

Dr. Daniel Krewski

NSERC/SSHRC/McLaughlin Chair Population
Health Risk Assessment

Dr. Marino Labinaz

Chair Interventional Cardiology Leadership

Dr. Frans Leenen

Pfizer Research Chair Hypertension

Dr. Ian Lorimer

A.&E. Leger Memorial Fund for Oncology
Research Chair

Dr. Ruth McPherson

Merck Frosst Canada Chair Atherosclerosis

Dr. Thierry Mesana

Gordon F. Henderson Chair Leadership

Dr. Thierry Mesana

Chair Cardiac Surgery Valve Research

Dr. Éric Poulin

Wilbert J. Keon Chair of the Department of
Surgery

Dr. Marc Ruel

Chair Cardiac Surgery Research

Dr. Marc Ruel

Michael Pitfield Chair Cardiac Surgery

Dr. Michael Schlossmacher

Bhargava Research Chair for
Neurodegenerative Diseases

Dr. Duncan Stewart

Evelyn and Rowell Laishley Chair for the OHRI
CEO and Scientific Director

Dr. Catherine Tsilfidis

Donald and Joy MacLaren Chair for Vision
Research

Dr. Barbara Vanderhyden

Corinne Boyer Research Chair Ovarian Cancer

Clinical Research Chairs

Dr. Shawn Aaron

Department of Medicine
Tier 1 Chair in Obstructive Lung Disease

Dr. Rob Beanlands

Department of Cardiology
Tier 1 Chair in Cardiovascular Imaging Research

Dr. David Birnie

Department of Medicine Cardiology
Tier 1 Chair in Cardiac Arrhythmia Research

Dr. Gregory Knoll

Department of Medicine
Tier 1 Chair in Clinical Transplantation Research

Dr. Grégoire LeGal

Department of Medicine
Tier 1 Chair in Diagnosis VTE

Dr. Alex MacKenzie

Department of Paediatrics
Tier 1 Chair in Rare Neurologic Disease Therapeutics

Dr. Marc Alan Rodger

Department of Medicine
Tier 1 Chair in Venous Thrombosis and Thrombophilia

Dr. Ian Stiell

Department of Emergency Medicine
Tier 1 Chair in Acute Cardiac Conditions

Dr. Gonzalo Alvarez

Department of Medicine Respiriology
Tier 2 Chair in Tuberculosis in Canadian Aboriginal Communities

Dr. Rebecca Auer

Department of Surgery
Tier 2 Chair in Perioperative Cancer Therapeutics

Dr. Kym Boycott

Department of Paediatrics
Tier 2 Chair in Neurogenetics

Dr. Marc Carrier

Department of Medicine
Tier 2 Chair in Cancer and Venous Thromboembolism

Dr. Darryl Davis

Department of Medicine
Tier 2 Chair in Cardiac Regeneration

Dr. David Dymant

Department of Paediatrics
Tier 2 Chair in Translational Epilepsy Research

Dr. Claire Liddy

Department of Family Medicine
Tier 2 Chair in Family Medicine

Dr. Kusum Menon

Department of Paediatrics
Tier 2 Chair in Pediatric Shock

Dr. Lisa Mielniczuk

Department of Medicine Cardiology
Tier 2 Chair in Heart Failure and Pulmonary Hypertension Research

Dr. Jeffrey Perry

Department of Emergency Medicine
Tier 2 Chair in Emergency Neurological Research

Dr. Amy Plint

Department of Pediatrics
Tier 2 Chair in Pediatric Emergency Medicine

Dr. Giorgio Tasca

Department of Psychiatry
Tier 2 Chair in Psychotherapy Research

Dr. Christian Vaillancourt

Emergency Medicine
Tier 2 Chair in Emergency Medicine

Dr. Leanne Marie Ward

Department of Paediatrics
Tier 2 Chair in Pediatric Bone Health

Dr. Roger Zemek

Department of Paediatrics and Emergency Medicine
Tier 2 Chair in Pediatric Concussion



Junior Clinical Research Chairs

Dr. Angel Arnaout

Department of Surgery
Junior Clinical Research Chair in “Window of Opportunity” Clinical Trials in Surgical Oncology

Dr. Lise Bjerre

Department of Family Medicine
Junior Clinical Research Chair in Pharmacoepidemiology and Medication Appropriateness

Dr. James Bonaparte

Department of Otolaryngology
Junior Clinical Research Chair in Otolaryngology

Dr. Innie Chen

Department of Obstetrics and Gynecology
Junior Clinical Research Chair in Reproductive Population Health and Health Services

Dr. Warren Cheung

Department of Emergency Medicine
Junior Clinical Research Chair in Medical Education with the Department of Emergency Medicine

Dr. Girish Dwivedi

Department of Medicine
Junior Clinical Research Chair in Vascular Inflammation and Atherosclerosis Research

Dr. Rustum Karanjia

Department of Ophthalmology
Junior Clinical Research Chair in Neuro-ophthalmology

Dr. Matthew Lines

Department of Pediatrics
Junior Clinical Research Chair in Mitochondrial Disorders

Dr. Daniel McIsaac

Department of Anesthesiology
Junior Research Chair in Perioperative Health Systems and Outcomes Research

Dr. Abigail Ortiz

Department of Psychiatry
Junior Clinical Research Chair in Mood Disorders

Dr. Nicola Schieda

Department of Radiology
Junior Clinical Research Chair in Radiology

Dr. Jodi Warman Chardon

Department of Medicine
Junior Clinical Research Chair in Novel Gene Discovery in Neuromuscular Disease

Research Funding

UNIVERSITY OF OTTAWA | FACULTY OF MEDICINE | 2015-2016

RANKINGS AND PERFORMANCE

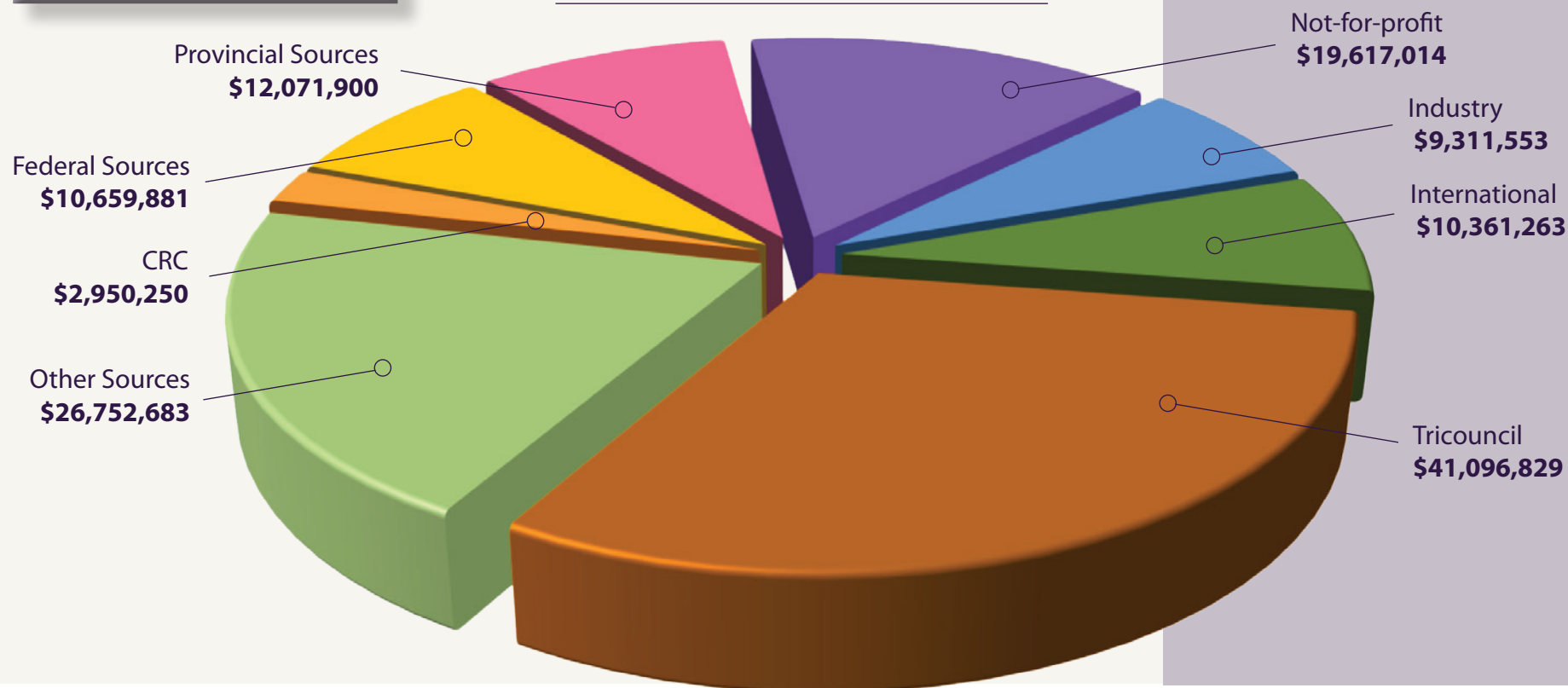
#1 Overall in Canada, Citations/
Faculty (QS World University
Ranking 2014/15)

#2 Medical/Science Grants
(MacLean's 2016)

#84 Worldwide Top 100 Clinical
Medicine (NTU Rankings 2016 ↑
11 positions since 2014)

**\$133
MILLION**

RESEARCH FUNDING	AMOUNT
Tricouncil	\$ 41,096,829
CRC	\$ 2,950,250
Federal Sources	\$ 10,659,881
Provincial Sources	\$ 12,071,900
Not-For-Profit	\$ 19,617,014
Industry	\$ 9,311,553
International	\$ 10,361,263
Other Sources	\$ 26,752,683



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