

# TOGETHER TO INNOVATE!

DNA

molecule

RI-MUHC  
ANNUAL REPORT  
2016–2017  
ADULT AND PEDIATRIC  
BIOMEDICAL RESEARCH

Centre universitaire  
de santé McGill  
Institut de recherche



McGill University  
Health Centre  
Research Institute

# INNOVATIVE HEALTH CARE DEPENDS ON INNOVATIVE RESEARCH.

At the Research Institute of the  
McGill University Health Centre,  
we're together to innovate!



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**427**

active members,  
including  
**206** fundamental,  
**134** clinical and  
**82** evaluative researchers



**1,190**

research trainees,  
including **330** M.Sc. and  
**490** PhD candidates,  
**220** postdocs and **150**  
clinical research fellows



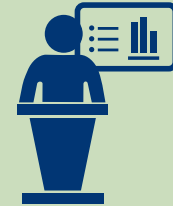
Ongoing research  
collaborations with  
**51**  
countries



Over **1,800**  
peer-reviewed scientific  
publications



Over **1,800**  
ongoing research projects



Over **2,000**  
scientific talks given by our  
researchers worldwide



**39**  
invention disclosures



**24** patents filed  
in various countries,  
corresponding to  
**17** different inventions



**10** patents issued  
in various countries,  
corresponding to  
**6** different inventions



**28** technology or patent  
license agreements



**321** research  
contracts and **640**  
agreements signed

## Message from BRUCE MAZER, MD, and RAYMOND ROYER

**We have completed Year Two** in our tremendous new facility at the Research Institute of the McGill University Health Centre (RI-MUHC). Like children in their third year, our institute is rapidly developing and growing. Focused on improving performance of our healthcare system through discoveries and innovation, we are also excited due to new faculty joining our programs.

Areas of innovation this year included finalizing an agreement with the Quebec Ministry of Economic Development, Science and Innovation to develop early-phase clinical trials in collaboration with other centres in Quebec.

A grant from the federal Post-Secondary Institutions Strategic Investment Fund, with contributions from the provincial government and Montreal General Hospital Foundation, allows for significant redevelopment of research areas at the Montreal General Hospital (MGH). Plans include new space for the Centre for Outcomes Research and Evaluation, a satellite Centre for Innovative Medicine (our unique clinical trials area), and the Surgical Innovation Platform, our centrepiece for MGH redevelopment. This dedicated incubator for cutting-edge technology will promote interaction among scientists, engineers, lawyers and industry. To these activities we add inventions and other breakthroughs facilitated by the Business Development Office, led



**Bruce Mazer, MD**

Executive Director and Chief Scientific Officer (Interim), RI-MUHC



**Raymond Royer**

Chairman of the Board of Directors, RI-MUHC

by Dr. Costas Karatzas. Several are highlighted in this report.

The remarkable community and facilities at the RI-MUHC have led to renewed interest on the part of young faculty; multiple interviews and new hires are pending. Our research programs have attracted top-flight talent, including investigators in neuroscience, cancer, aging, metabolism, and surgical innovation, with active searches ongoing.

This is by no means a plateau. Group efforts are underway to improve transectorial interactions, creating groups that harness the power of our programs by bringing researchers from multiple disciplines together, creating added value for the RI-MUHC.

We sincerely thank our dedicated members, partners and supporters. To complete the toddler analogy, if we spent our first two years post-move learning to walk, we are now clearly ready to run! ■

## Message from AIMEE RYAN, PhD



### Aimee Ryan, PhD

Deputy Executive Director and Deputy Chief Scientific Officer (Interim),  
Research Institute of the McGill University Health Centre (RI-MUHC)  
Head of Child Health Research (Interim),  
MUHC

### The child health research community at the RI-MUHC

epitomizes the *Together to Innovate* theme of this report. Our researchers embrace social media and provide internet resources for patients and families. We use genomics to identify mutations underlying developmental disabilities, congenital anomalies and cancers. We explore innovative methods to improve quality of adult life in individuals treated for childhood diseases: restoring fertility in those treated with chemotherapeutic agents as children, or improving retention of kidney transplants in adolescents transitioning into adulthood.

Child health researchers continue to demonstrate research leadership.

**Dr. Annette Majnemer** co-leads the pan-Canadian CHILD-BRIGHT network, improving life outcomes for children with brain-based developmental disabilities (see p. 6).

**Dr. Larry Lands's** recommendations for newborn screening for cystic fibrosis have been adopted by the Quebec government, and **Dr. Moshe Ben-Shoshan's** research was recognized as one of ten Best Research Publications in Pediatrics for 2016 by the *New England Journal of Medicine* Publication Watch (pp. 6 and 8).

Our trainees impress with their innovative ideas and many garner national awards, like **Marie-Julie Allard** from **Dr. Guillaume Sébire's** research group, whose autism research earned her recognition by Radio-Canada this year as one of 30 inspirational people under 30. The future of child health research is in good hands as these young scientists move toward independent careers.

We thank The Montreal Children's Hospital Foundation and staff, who work with community donors and other foundations, including the Foundation of Stars, to support our new investigators and trainees and launch innovative research projects. We look forward to continued research innovation and excellence as fundamental, clinical and evaluative child health researchers at the RI-MUHC work to advance health care and the well-being of children throughout their lives. ■

## Message from the MCGILL UNIVERSITY HEALTH CENTRE (MUHC)



### Martine Alfonso

Interim President and Executive Director, MUHC

**As an academic health centre** that strives to carry out world-class clinical care, research and teaching in a networked health system, the McGill University Health Centre (MUHC) is proud that the Research Institute of the MUHC (RI-MUHC) has collaborative relationships in Canada and over 50 countries. Through these alliances and its focus on translational research and intervention across the lifespan, the RI-MUHC is having an impact on the health and well-being of people at home and around the globe, while also helping to shape the future of health care. Our commitment to collaborate in the name of progress has also allowed the RI-MUHC to advance knowledge, which in turn has ranked it consistently over the last decade among the top three hospital-based research institutes in Canada.

I am pleased to thank the RI-MUHC's Interim Executive Director and Chief Scientific Officer, Dr. Bruce Mazer, its researchers and board of directors, as well as foundations, donors and granting agencies for supporting research discoveries and innovation at the MUHC. ■

## Message from MCGILL UNIVERSITY

**Research in the health sciences** has long been the transformative force solving some of the world's most pressing challenges, enabling us to discover treatments and cures for deadly diseases. Improving the health of our communities locally, nationally and globally requires a perfect balance among basic, translational and clinical discoveries. Throughout this report are outstanding examples made possible by work conducted at the RI-MUHC. Yet there is still much more we must do to remain at the forefront of a changing health landscape.

McGill is very proud of its longstanding partnership with the RI-MUHC, with which we share a passion for research and commitment to train the best scientists. Today's early-career researchers represent Canada's future ability to face the health challenges of the 21st century. State-of-the-art facilities and world-class mentors at the RI-MUHC provide them with an incredibly enriching opportunity to realize their potential and help keep Canada on the map as a global beacon in health science research.

We congratulate colleagues at the RI-MUHC on yet another successful year, and we look forward to continuing to innovate together for the benefit of the populations we serve. ■



### David Eidelman, MD, CM, FRCPC

Vice-Principal (Health Affairs) and Dean, Faculty of Medicine



### Martha Crago, PhD

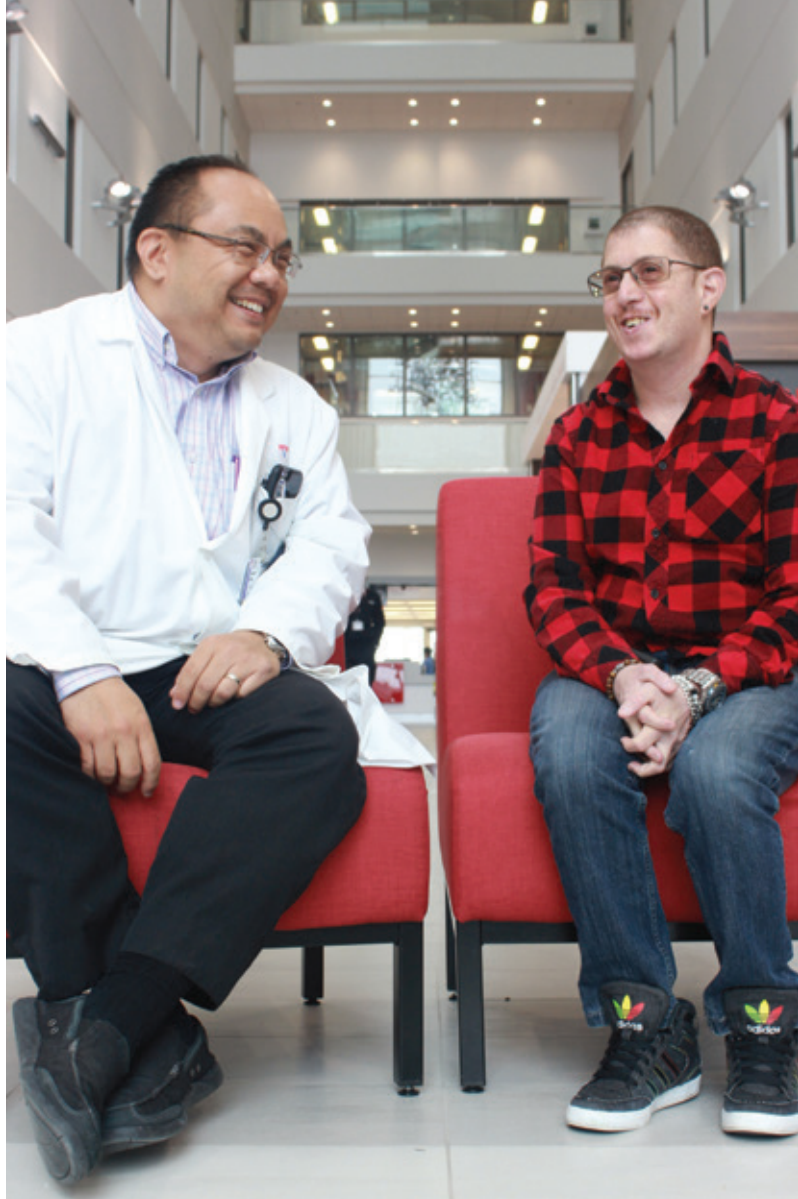
Vice-Principal (Research and Innovation)



## FROM DIAGNOSTIC ODYSSEY TO THERAPEUTIC HOPE

**Dr. Donald Vinh** (Infectious Diseases and Immunity in Global Health Program) specializes in solving medical mysteries by taking clinical observations back to the laboratory bench. His breakthrough in the case of Steven Francis, a patient whose condition had eluded diagnosis for 30 years, was recently published in the *Journal of Allergy and Clinical Immunology*.

Dr. Vinh discovered that Francis harboured a rare genetic mutation that left him immunocompromised and susceptible to recurrent infections. As no treatment for ZAP70 immune deficiency existed, Dr. Vinh's team developed a molecule that specifically blocked this mutation, restoring immune function and providing hope for future therapy. ■



Donald Vinh, MD with MUHC patient Steven Francis



Kaberi Dasgupta, MD, M.Sc.



## ACTIVITY PRESCRIPTIONS: ONE "STEP" CLOSER TO A HEALTHY LIFESTYLE

**Dr. Kaberi Dasgupta** (Metabolic Disorders and Complications Program) and her team showed that written "step prescriptions" from a physician are associated with improved health outcomes in patients with type 2 diabetes and hypertension.

Their study published in *Diabetes, Obesity and Metabolism* provided all participants with a pedometer, but only some with a written step count prescription. After one year, patients given the prescription increased their daily counts by 1,200 steps compared to patients not given one, and those with type 2 diabetes showed improved blood sugar control and reduced insulin resistance. It's a step toward reducing complications of a prevalent chronic disease. ■



## A BRIGHTER FUTURE FOR CHILDREN WITH BRAIN-BASED DEVELOPMENTAL DISABILITIES



**The CHILD-BRIGHT Network** is a new pan-Canadian research network that aims to improve life outcomes for children with brain-based developmental disabilities and their families.

Principal investigator **Dr. Annette Majnemer** (Child Health and Human Development Program) leads the network and five-year project with co-directors at The Hospital for Sick Children (SickKids) and the BC Children’s Hospital.

She is pioneering patient-oriented programs in research, knowledge translation and training, as well as a citizen engagement platform.

CHILD-BRIGHT is one of seven nationwide networks supported by the Canadian Institutes of Health Research under Canada’s Strategy for Patient-Oriented Research (SPOR). More at [www.child-bright.ca](http://www.child-bright.ca). ■



**Annette Majnemer, OT, PhD**



**Moshe Ben-Shoshan, MD**

## NEW APPROACH TO DIAGNOSING ANTIBIOTIC ALLERGIES IN CHILDREN

**Dr. Moshe Ben-Shoshan** (Infectious Diseases and Immunity in Global Health Program) and his team are changing the way we understand childhood antibiotic allergies. They have demonstrated that the traditional method for diagnosing these allergies, based on skin testing, lacks sensitivity.

Graded provocation tests, an alternative method of allergy testing in which children are gradually given the antibiotic, proved to be faster, cheaper and more sensitive than skin testing. Dr. Ben Shoshan’s findings, published in *JAMA Pediatrics*, demonstrated that skin tests were negative for 94.1% of children who had positive provocation tests for amoxicillin, indicating that skin tests are not appropriate for diagnosing childhood amoxicillin allergies. ■



## NEWBORN SCREENING FOR CYSTIC FIBROSIS IN QUEBEC

**Cystic fibrosis (CF) is a respiratory disease** characterized by the production of thick mucus that blocks the airways, resulting in chronic infections. Children with CF who are diagnosed through newborn screening are healthier as they can be treated sooner, preventing complications, as **Dr. Larry Lands** (Translational Research in Respiratory Diseases Program) has demonstrated.

His study published in the *Journal of Cystic Fibrosis* helped build the case for advocacy of newborn CF screening in Quebec. Thanks to his work and that of other CF Canada members, the Quebec Ministry of Health and Social Services announced in June 2017 that screening will be implemented. ■



**Larry Lands, MD, PhD**





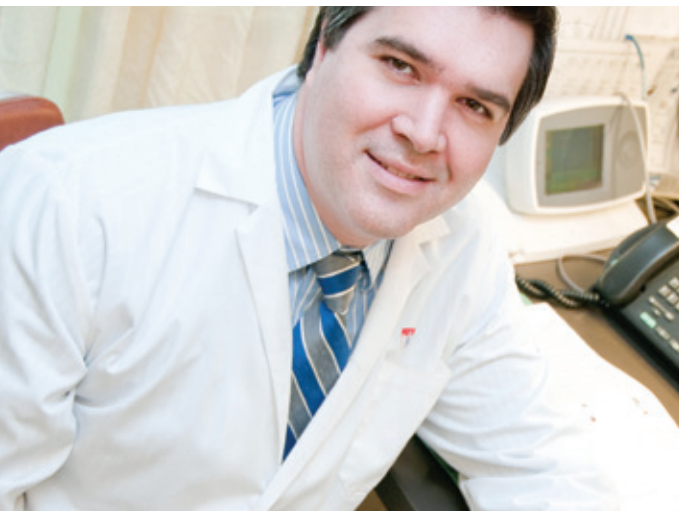
## DISCOVERY OF A NOVEL MUTATION LINKED TO HIP OSTONECROSIS

**Osteonecrosis, or “bone death,”** occurs when blood flow to the bone is disrupted. In the hip bone, specifically the femoral head, it eventually necessitates hip replacement.

**Dr. Chantal Seguin** (Injury Repair and Recovery Program) and her team discovered that a novel mutation in a gene called TRPV4 is linked with osteonecrosis. Their breakthrough could shed light on mechanisms driving disease progression, as this gene is known to play important roles in both bone cell development and blood flow regulation. Ultimately, these findings could allow doctors to identify and treat bone death before symptoms arise, and potentially avoid hip replacements. ■



Chantal Séguin, MD



George Thanassoulis, MD, M.Sc.

## LIPOPROTEIN(A): A NEW RISK FACTOR IN HEART DISEASE

**Dr. George Thanassoulis** (Cardiovascular Health Across the Lifespan Program) and his team have demonstrated that a relatively unknown type of cholesterol called Lipoprotein(a), or Lp(a), is associated with increased risk of heart disease.

One in 14 heart attacks and one in seven cases of aortic valve disease are due to Lp(a), as their study published in *Arteriosclerosis, Thrombosis and Vascular Biology* reveals. “We hope our work raises awareness that individuals with high Lp(a) are at high risk of heart disease, and that it stimulates the development and testing of new therapies,” says Dr. Thanassoulis. This highly specialized test is available at the MUHC. ■



## NEW MARKER IDENTIFIED FOR PANCREATIC CANCER

**Pancreatic ductal adenocarcinoma (PDAC)** is a leading cause of cancer-related deaths, largely because symptoms only become evident once the cancer has progressed to an advanced stage.

**Drs. Zu-Hua Gao and George Zogopoulos** (Cancer Research Program) and **Dr. Jun-Li Liu** (Metabolic Disorders and Complications Program) have discovered a new biomarker for this disease, a discovery that outlines quantifiable characteristics of the biological processes.

“We found that PDAC patients had elevated levels of regenerating (Reg) proteins, Reg1A and Reg1B, in their serum and in their cancer tissue,” explains Dr. Gao. “Our findings can help in the early diagnosis of pancreatic cancer, which may improve survival.” ■



Zu-Hua Gao, MD, PhD and Jun-Li Liu, PhD



## **RI-MUHC LEADERS AND INNOVATORS**

*How can we ensure the right radiation dosage?*

*Manage pain?*

*Use less invasive screening methods?*

*Optimize positive effects of drugs and  
reduce the negative?*

At the Research Institute of the McGill University Health Centre (RI-MUHC), clinical, fundamental and health outcomes researchers come together to innovate.

With research projects advancing health care across the lifespan, here are some of our leaders who try the paths not yet taken.



## FROM BENCH TO BEDSIDE: RESEARCH THAT COMPLETES THE INNOVATION CONTINUUM

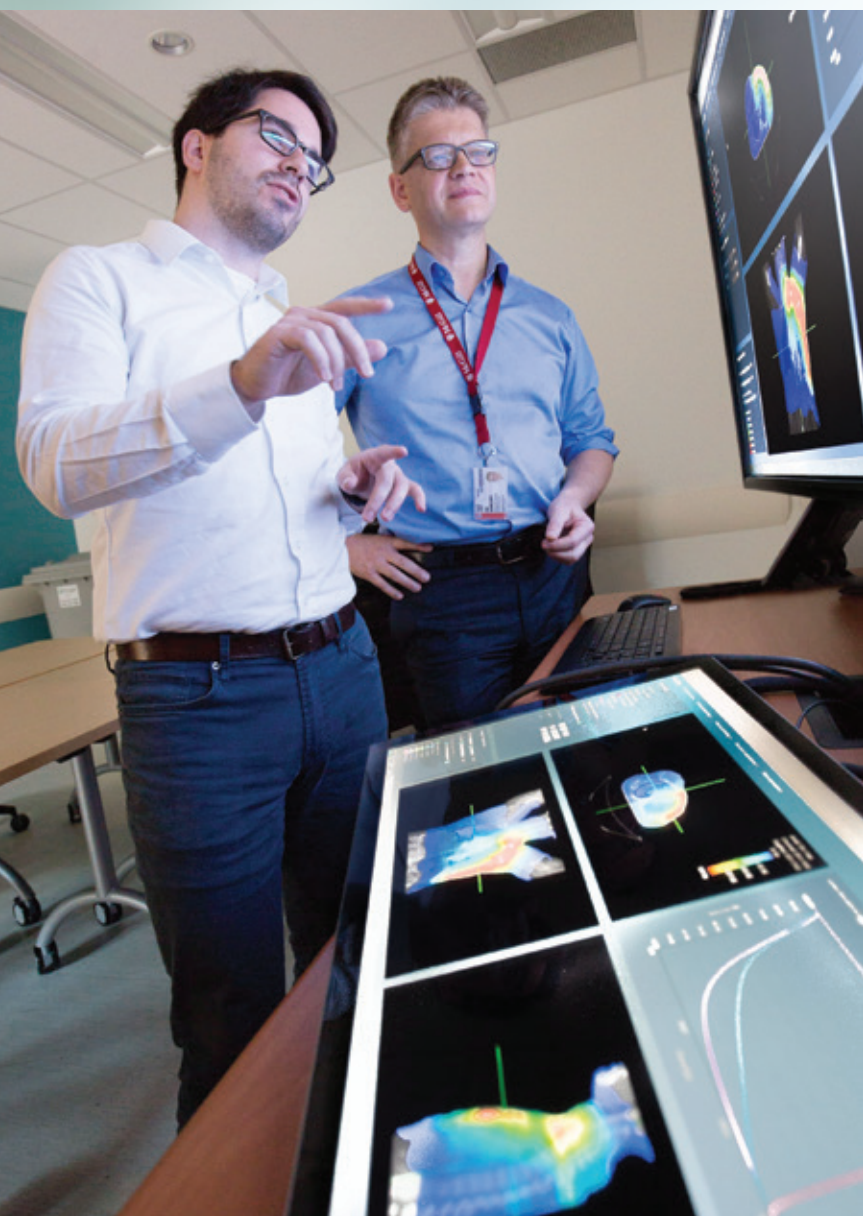
### Delivering the right dose of radiation for cancer patients

**For Dr. Jan Seuntjens**, a member of the Cancer Research Program at the Research Institute of the McGill University Health Centre (RI-MUHC), it all begins and ends with the patient.

“All of my research questions come from the clinic,” explains the medical physicist, whose work revolves around techniques to ensure accurate radiation dosage in cancer therapy. Recently, postdoctoral fellow **Dr. James Renaud**, working with Dr. Seuntjens and a collaborator, **Dr. Arman Sarfehnia** (Sunnybrook, Toronto), discovered a way to miniaturize a calorimetric-based radiation detector from something the size of a fridge to a pencil-sized probe named the Aerrow. The technology has been sold to an American company now working with Dr. Seuntjens’ group and with a Quebec-based engineering firm to bring the probe to market.

This is not the only project from the physicist’s lab heading for clinical application. Dr. Seuntjens’ doctoral student, **Marc-André Renaud**, and colleague **Dr. François DeBlois** (Centre hospitalier de l’Université de Montréal) developed a software system that uses a computational algorithm based on the Monte Carlo technique to determine radiation dose. The software, Radify, uses a computed tomography scan of the patient to calculate the amount of radiation energy absorbed by the tissues. Purchased, as Aerrow was, by an American company, Radify will be used for quality assurance of radiation therapy delivery.

These contracts are a coup for the research group, but Dr. Seuntjens’ main goal is to get the technology to market where it can be used to benefit patients. ■



Assessing radiation modelling accuracy: **Jan Seuntjens, PhD** (right), and student, **Marc-André Renaud**

*All of my research questions come from the clinic.*

—*Dr. Jan Seuntjens*



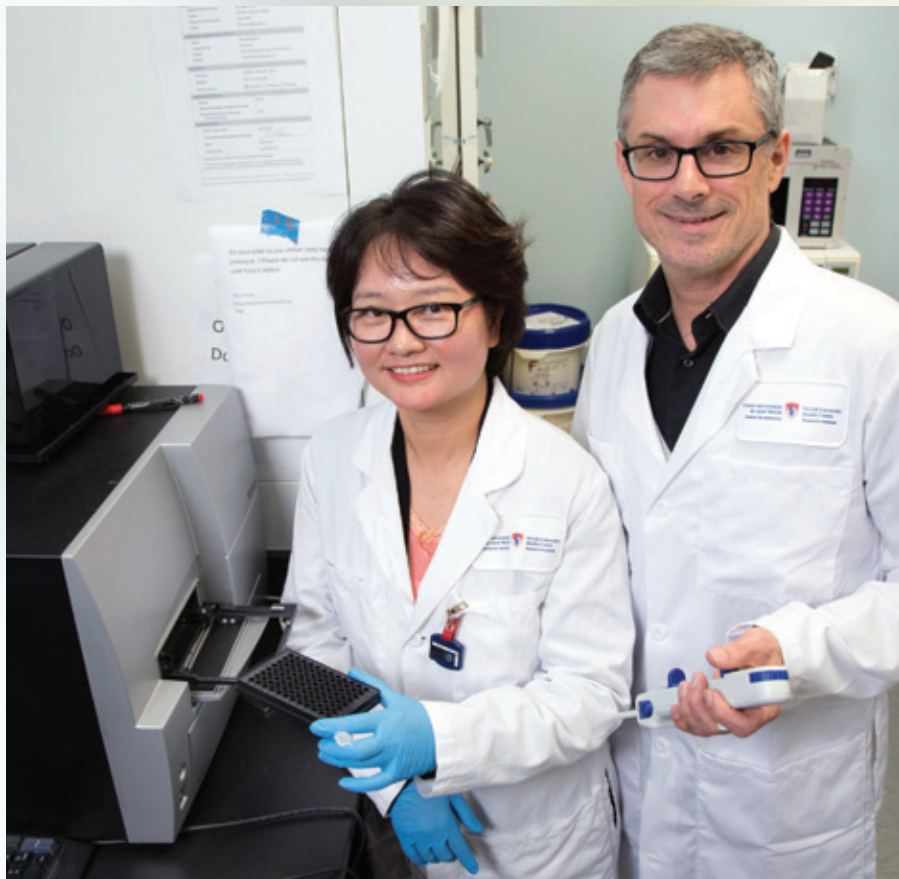
## Mapping pathways in drug response

**Roughly 40% of drugs** currently on the market—from beta-blockers to opioids—target a class of membrane proteins found in the human genome that are known as G protein-coupled receptors (GPCRs).

More than 800 GPCRs control all kinds of processes throughout the human body, says **Dr. Stéphane Laporte**, a member of the Metabolic Complications and Disorders Program and Director of the Molecular Imaging Platform at the RI-MUHC. However, few of these GPCRs are well understood, and drugs act in diverse ways on those that are known.

Dr. Laporte and his team are working to change this by focusing on understanding the molecular and cellular mechanisms that regulate GPCRs. “The receptors act on different signalling pathways in the cell, and we can activate them, or block them, in different ways,” he says.

He and his colleagues, including **Dr. Michel Bouvier** of the Institute for Research in Immunology and Cancer, Université de Montréal, have developed biosensors that can be used to “light up” the different pathways in living cells. The hope, for drug companies, is that if they know which pathways to target, they can find a drug that produces the desired beneficial effects without the negative effects: for example, an opioid that relieves pain without causing tolerance, respiratory depression or constipation, says Dr. Laporte.



**Stéphane Laporte, PhD** (right), and research associate **Yoon Namkung, PhD**: Harnessing biosensor technology

The novel technology has already been licensed by several therapeutic and pharmaceutical companies, and Dr. Laporte expects that new and improved medications will be available in the next five to ten years. ■

*The hope, for drug companies, is that if they know which pathways to target, they can find a drug that produces the desired beneficial effects without the negative effects.*



## AN INFORMED APPROACH TO MEDICAL CANNABIS USAGE

### Learning from patients in pain

**“I focus on trying to take an integrative and scientific approach** to a

product like cannabis, which is widely used and widely misunderstood,” says **Dr. Mark Ware** (Brain Repair and Integrative Neuroscience Program; Centre for Outcomes Research and Evaluation).

A family physician who works in chronic pain, Dr. Ware was initially inspired to research the use of cannabis for pain management after hearing anecdotal evidence of its potential from his patients. Although he has been doing this research for some 17 years, Dr. Ware, vice-chair of the recent Canadian federal task force on cannabis legalization and regulation, cautions that there is still a lot to learn.

“Clinical research needs patients *and* patience,” he says, and cannabis research tends to take longer because the regulatory pathways are quite new. “We are forging paths that have not been taken, and asking questions that have not been asked before,” he explains.

Dr. Ware is principal investigator of the Quebec Cannabis Registry, the world’s first research database on the use of cannabis for medical purposes, and he is excited by the potential of the database to answer some of these questions. “As of today we are about halfway to our target enrolment of 3,000 patients,” he reports. He is hopeful that by late 2017, the registry will have a dataset clean enough to ask some preliminary questions. ■



“Asking questions that have not been asked”: **Mark Ware, MD, M.Sc.**





## A counterintuitive approach to COPD management

**It all began with questions from patients** with chronic obstructive pulmonary disease (COPD) who were participating in a clinical trial for oral morphine. A few wondered whether anyone was doing research into cannabis for the management of breathlessness. The idea seemed counterintuitive, says **Dr. Dennis Jensen** (Translational Research in

Respiratory Diseases Program; Centre for Innovative Medicine), but once he and his team looked at the literature, they realized there might be something to it.

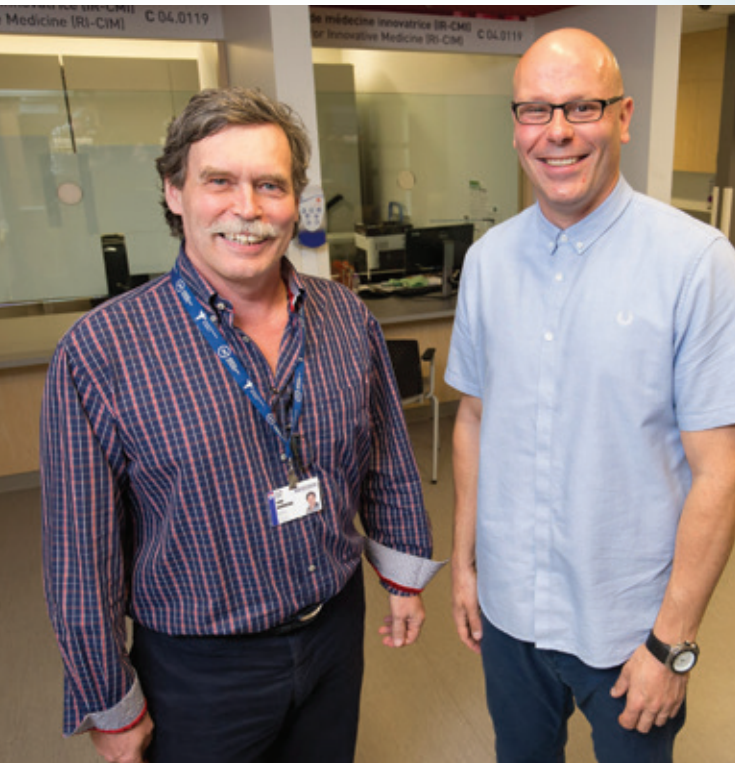
In a series of studies done about 40 years ago, “there was some evidence that smoked cannabis actually improved acute lung function in healthy adults and in patients with asthma,” he explains.

Dr. Jensen and colleagues, including **Dr. Jean Bourbeau**, Director of the Centre for Innovative Medicine, and **Dr. Mark Ware**, reached out to the medical marijuana company Tilray and proposed a pilot randomized clinical trial to look at the effect of cannabis on pulmonary function, breathlessness and exercise tolerance in patients with COPD.

The patients in the trial all had advanced COPD and suffered from disabling breathlessness, despite receiving optimal available medication for their disease. They were given inhaled vaporized cannabis or a placebo, followed by a series of lung function tests and a cardiopulmonary cycle exercise endurance test. The trial has been completed with results pending publication.

“This is truly the first trial in the world to look at this in COPD,” says Dr. Jensen. “And this trial is just the first step.” ■

**Jean Bourbeau, MD, M.Sc.,**  
and **Dennis Jensen, PhD**



**Dr. Jensen** explains the administration of inhaled vaporized cannabis.





## A NONINVASIVE TEST FOR CHILDREN WITH KIDNEY DISEASE

**“The most common cause of kidney failure** in children is from a kidney connected to a malformed drainage system,” says pediatric nephrologist **Dr. Indra Gupta** (Child Health and Human Development Program; Centre for Translational Biology).

Currently, to diagnose this kind of drainage defect, physicians must insert a catheter in the child’s urethra, fill the bladder with contrast dye, and then

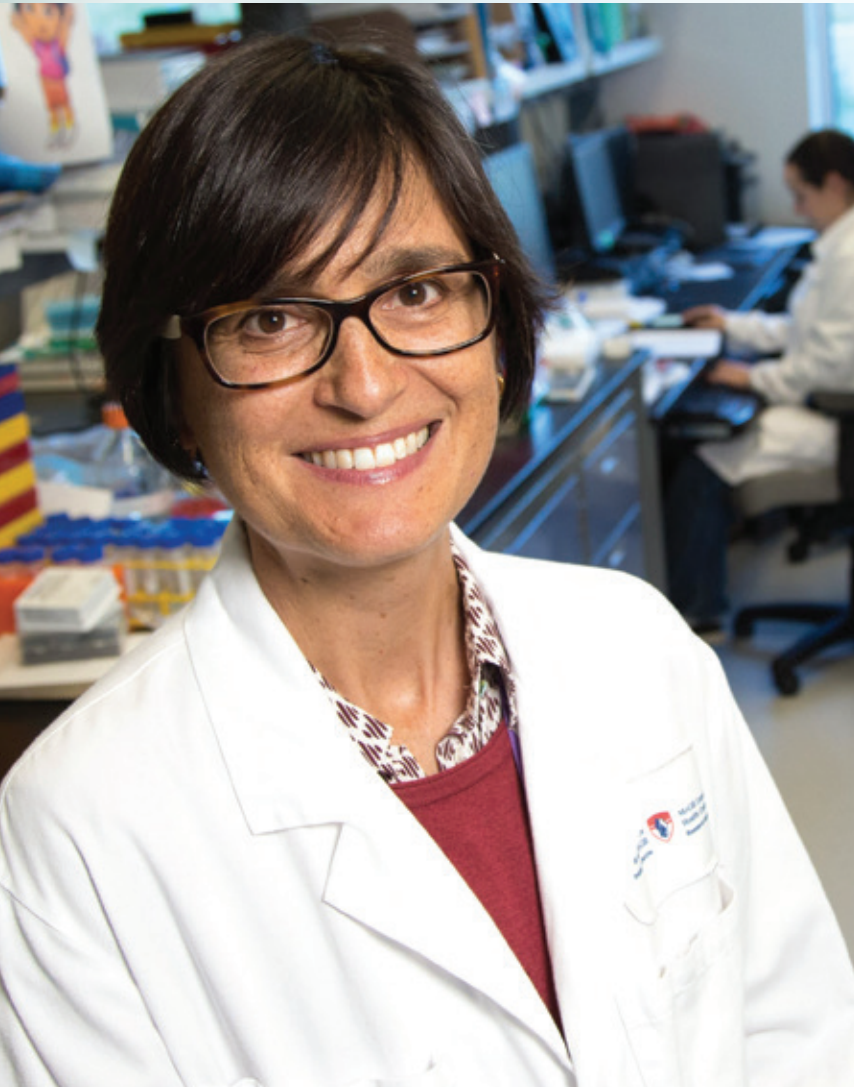
use radiation-based imaging technology. “It’s not very pleasant for the children, or for the parents,” says Dr. Gupta. She is hopeful, however, that there will eventually be a much simpler test for the children that can be performed at the bedside.

Dr. Gupta and her colleagues identified a gene—tenascin XB—associated with the development of support tissues in the drainage system as well as other areas of the body.

“Children who have mutations in this gene have a defect in their drainage system and they get frequent urine infections,” she explains. “Our work has determined that these children are also double-jointed or very flexible, probably because there are also defects in the support tissues around the joints.”

*A simple test for hypermobility performed at the bedside*

This led the research team to investigate a simple test for hypermobility that involves asking children to manipulate their joints, in order to further identify those at risk for drainage problems. Dr. Gupta and her colleagues are currently using this screening method to test children suspected of being at risk of drainage problems in hopes of confirming the association. “And the children actually enjoy doing it!” she says. ■



**Indra Gupta, MD**, a pediatric clinician-scientist, finds solutions for her young patients with kidney disease







## NEW TARGET FOR CYSTIC FIBROSIS DRUG DEVELOPMENT: CERAMIDES

**Cystic fibrosis (CF)** is a deadly respiratory disease characterized by thick mucus in the lungs. This mucus becomes colonized by pathogens and initiates a vicious cycle of infection and inflammation. Although no effective therapeutic options for CF exist, **Dr. Danuta Radzioch** (Infectious Diseases and Immunity in Global Health Program) and her research team have made important advances with the help of industry.

The team discovered that ceramides—a specialized type of lipids found in human cells—are imbalanced in the lungs of CF patients. Ceramides are involved in triggering immune responses necessary to combat infections. Thus, severely imbalanced ceramide levels are associated with an inability to mount an effective immune response against these pathogens. The team further demonstrated that administration of the drug fenretinide can restore normal levels of protective ceramides in CF patients.

“CF patients are often treated with corticosteroids, but these drugs suppress the immune system and impede its ability to fight infection,” explains Dr. Radzioch. “What makes fenretinide so exciting is that, in contrast to corticosteroids, correcting ceramide imbalance actually *improves* the ability of the immune system to combat pathogens.”



**Danuta Radzioch, PhD:** Advancing cystic fibrosis research



**Costas Karatzas, PhD, and Marlies Otter, PhD,** of the Business Development Office, RI-MUHC

These groundbreaking findings from the Phase Ib trial were published in the *Journal of Molecular Medicine*, and Laurent Pharmaceuticals Inc. is sponsoring a Phase II clinical trial.

The development of fenretinide for the treatment of CF depended on dedicated collaborators, says Dr. Radzioch, including **Drs. Elias Matouk** and **Larry Lands** (Translational Research in Respiratory Diseases Program), the McGill Office of Technology Transfer, industry partners, and **Dr. Costas Karatzas**, Director of the Business Development Office at the Research Institute of the McGill University Health Centre. “This ongoing team effort enabled us to protect critical patents, secure funding opportunities and partner with a private company so that our research could transition through pre-clinical and early clinical trials, with the ultimate goal of benefitting CF patients,” she explains. ■

### DID YOU KNOW?

*It takes 12 to 15 years and around \$1 billion to bring a new drug from discovery in the lab to the marketplace.*



Nearly 1,200 research trainees provide a wealth of new ideas at the Research Institute of the McGill University Health Centre (RI-MUHC). These are only a few.

## Students



**RENATA BAHOUS**  
**DOCTORAL CANDIDATE**

Supervisor: **Dr. Rima Rozen**  
Child Health and Human Development Program

**GENETIC DEFICIENCIES IN THE METABOLISM OF FOLIC ACID**

- FRQS award
- Showed high levels of folic acid in pregnant mice leads to short-term memory impairment in offspring (*Human Molec Genet.* 2017). Suggests that pregnant women should consume modest amounts of folic acid
- Two publications; seven presentations with three awards



**CLAIRE GIZOWSKI**  
**DOCTORAL CANDIDATE**

Supervisor: **Dr. Charles Bourque**, Brain Repair and Integrative Neuroscience Program

**THIRST, OSMOREGULATION, CIRCADIAN RHYTHMS, NEUROTRANSMISSION**

- Recipient of the first Carbonetto Award from the Centre for Research in Neuroscience
- First-author publication in *Nature*



**KASHIF KHAN**  
**M.Sc. CANDIDATE**

Supervisor: **Dr. Renzo Cecere**, Cardiovascular Health Across the Lifespan Program

**HEART TISSUE REGENERATION, ANGIOGENESIS, STEM CELL, HIPPO CELL FACTOR**

- First prize: Annual 3-Minute Thesis (3MT) competition, McGill University
- First prize and People's Choice Award: 2017 Eastern Regional 3-Minute Thesis Competition, University of New Brunswick



**EMERSON KROCK, PhD**  
**DOCTORAL CANDIDATE IN 2016-2017**

Supervisor: **Dr. Lisbet Haglund**, Injury Repair Recovery Program

**BACK PAIN**

- FRQS doctoral award (three years) and two additional fellowships
- Five publications to date, three as first author
- Awarded best oral presentation at World Forum for Spine Research in Xi'an, China, May 2014



## Postdoctoral Fellows



### **DORIVAL MARTINS, PhD**

Supervisor: **Dr. Dao Nguyen**, Translational Research in Respiratory Diseases Program

#### **BIOCHEMISTRY, MOLECULAR BIOLOGY AND CHEMICAL PHYSIOLOGY OF ANTIBIOTIC TOLERANCE**

- CIHR Postdoctoral Fellowship
- Awards: Gordon Research Conference, Cystic Fibrosis European Meeting, RI-MUHC Respiratory Research Day
- One first-author publication, five in preparation; one report of invention
- Featured research in media: Cystic Fibrosis Canada
- Postdoctoral Career Day organizer
- Trainee committee: FRQS visit preparations



### **CLAIRE NASH, PhD**

Supervisor: **Dr. Axel Thomson**, Cancer Research Program

#### **PROSTATE, STROMA, MESENCHYME, ANDROGEN RECEPTOR, PRIMARY CELLS, CANCER-ASSOCIATED FIBROBLASTS**

- First and third author of two publications in *Molecular and Cellular Endocrinology* in 2017
- First prize for oral presentations: Cancer Research Program Research Day 2017, RI-MUHC; Fraser Gurd Research Day 2017, Experimental Surgery, McGill University



### **JESSICA WIDDIFIELD, PhD**

Supervisor: **Dr. Sasha Bernatsky**, Infectious Diseases and Immunity in Global Health Program

#### **EVALUATING PATIENT CARE AND OUTCOMES OF RHEUMATOID ARTHRITIS**

- Six peer-reviewed publications (first author of four) since 2016
- Ten abstracts/presentations at local, national and international scientific meetings
- CIHR/Arthritis Alliance of Canada Postdoctoral Prize recipient
- Lead or co-lead on five successful grant applications, with four more under review



### **LAMA YAMANI, PhD**

Supervisor: **Dr. Stéphane Laporte**, Experimental Therapeutics and Metabolism Program

#### **DEVELOPING AND VALIDATING BIOSENSORS AS TOOLS FOR IDENTIFYING BETTER DRUGS**

- Postdoctoral Training Fellowship, Mitacs Accelerate Program in partnership with Domain Therapeutics
- Third prize poster presentation, International Drug Discovery and Development Forum in Montreal, June 2017
- Authored five publications in high-impact journals, including co-authorship in *Nature Communications* in 2017



## AWARDS AND RECOGNITION

### **Marcel Behr, MD, M.Sc.**

Fellow, Canadian Academy of Health Sciences

### **Moshe Ben-Shoshan, MD**

One of ten Best Research Publications in Pediatrics (2016), *New England Journal of Medicine* Publication Watch

### **Christine McCusker, MD, M.Sc.**

F. Estelle R. Simons Award for Research, Canadian Society of Allergy and Clinical Immunology

### **Raquel del Carpio-O'Donovan, MD**

Gold Medal, Canadian Association of Radiologists

Gold Medal, Peruvian Radiology Society and InterAmerican College of Radiology

### **Theresa Gyorkos, PhD**

Vic Neufeld Mentorship Award in Global Health Research, Canadian Coalition for Global Health Research

### **Jim Hanley, PhD**

Statistical Society of Canada Impact Award

### **Bruce Mazer, MD**

Jerry Dolovich Award, Canadian Society of Allergy and Clinical Immunology

### **Martin Olivier, PhD**

Wardle Medal, Canadian Society of Zoologists

### **Nitika Pant Pai, MD, PhD**

"Transition-to-scale" support, Grand Challenges Canada

### **Morag Park, PhD**

Robert L. Noble Prize, Canadian Cancer Society

### **Louise Pilote, MD, PhD**

Woman of Distinction Award, Health category, YWCA

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Co-investigator, study selected as People's Choice, Top 10 Discoveries of 2016, *Québec Science* magazine

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Vice-chair, federal Task Force on Cannabis Legalization and Regulation

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**Maya Saleh, PhD**



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Andrea Benedetti  
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Nandini Dendukuri  
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Andrew Reader  
Amir Shmuel  
Hiroshi Tsuda

## SELECTED FROM OVER 1,800 PEER-REVIEWED PUBLICATIONS

### Investigators | Research trainees



#### INJURY REPAIR RECOVERY PROGRAM

Carli F, Gillis C, Scheede-Bergdahl C. *Promoting a culture of prehabilitation for the surgical cancer patient.* **Acta Oncol** 56(2):128-133, 2017.

Fiore JF, Jr., Castellino T, Pecorelli N, Niculiseanu P, Balvardi S, Hershorn O, Liberman S, Charlebois P, Stein B, Carli F, Mayo NE, Feldman LS. *Ensuring Early Mobilization Within an Enhanced Recovery Program for Colorectal Surgery: A Randomized Controlled Trial.* **Ann Surg** 266(2):223-231, 2017.

Hamdy RC, Bernstein M, Fragomen AT, Rozbruch SR. *What's New in Limb Lengthening and Deformity Correction.* **J Bone Joint Surg Am** 99(16):1408-1414, 2017.

Pittayanon R, Rerknimitr R, Klaikaew N, Sanpavat A, Chaithongrat S, Mahachai V, Kullavanijaya P, Barkun A. *The risk of gastric cancer in patients with gastric intestinal metaplasia in 5-year follow-up.* **Aliment Pharmacol Ther** 46(1):40-45, 2017.

Rosenzweig DH, Tremblay Gravel J, Bisson D, Ouellet JA, Weber MH, Haglund L. *Comparative analysis in continuous expansion of bovine and human primary nucleus pulposus cells for tissue repair applications.* **Eur Cell Mater** 33:240-251, 2017.

Sheikh Z, Zhang YL, Tamimi F, Barralet J. *Effect of processing conditions of dicalcium phosphate cements on graft resorption and bone formation.* **Acta Biomater** 53:526-535, 2017.

Trejo P, Fassier F, Glorieux FH, Rauch F. *Diaphyseal Femur Fractures in Osteogenesis Imperfecta: Characteristics and Relationship With Bisphosphonate Treatment.* **J Bone Miner Res** 32(5):1034-1039, 2017.

Vorstenbosch J, Nguyen CM, Zhou S, Seo YJ, Siblini A, Finnson KW, Bizet AA, Tran SD, Philip A. *Overexpression of CD109 in the Epidermis Differentially Regulates ALK1 Versus ALK5 Signaling and Modulates Extracellular Matrix Synthesis in the Skin.* **J Invest Dermatol** 137(3):641-649, 2017.



#### METABOLIC DISORDERS AND COMPLICATIONS PROGRAM

Campioli E, Lee S, Lau M, Marques L, Papadopoulos V. *Effect of prenatal DINCH plasticizer exposure on rat offspring testicular function and metabolism.* **Sci Rep** 7(1):11072, 2017.

Dasgupta K, Rosenberg E, Joseph L, Cooke AB, Trudeau L, Bacon SL, Chan D, Sherman M, Rabasa-Lhoret R, Daskalopoulou SS. *Physician step prescription and monitoring to improve ARTERial health (SMARTER): A randomized controlled trial in patients with type 2 diabetes and hypertension.* **Diabetes Obes Metab** 19(5):695-704, 2017.

Farsijani S, Payette H, Morais JA, Shatenstein B, Gaudreau P, Chevalier S. *Even mealtime distribution of protein intake is associated with greater muscle strength, but not with 3-y physical function decline, in free-living older adults: the Quebec longitudinal study on Nutrition as a Determinant of Successful Aging (NuAge study).* **Am J Clin Nutr** 106(1):113-124, 2017.

Groseclose SL, Buckeridge DL. *Public Health Surveillance Systems: Recent Advances in Their Use and Evaluation.* **Annu Rev Public Health** 38:57-79, 2017.

Haidar A, Messier V, Legault L, Ladouceur M, Rabasa-Lhoret R. *Outpatient 60-hour day-and-night glucose control with dual-hormone artificial pancreas, single-hormone artificial pancreas, or sensor-augmented pump therapy in adults with type 1 diabetes: An open-label, randomised, crossover, controlled trial.* **Diabetes Obes Metab** 19(5):713-720, 2017.

Nguyen-Yamamoto L, Karaplis AC, St-Arnaud R, Goltzman D. *Fibroblast Growth Factor 23 Regulation by Systemic and Local Osteoblast-Synthesized 1,25-Dihydroxyvitamin D.* **J Am Soc Nephrol** 28(2):586-597, 2017.

Robins R, Baldwin C, Aoudjit L, Cote JF, Gupta IR, Takano T. *Rac1 activation in podocytes induces the spectrum of nephrotic syndrome.* **Kidney Int** 92(2):349-364, 2017.

Wong J, Motulsky A, Abrahamowicz M, Eguale T, Buckeridge DL, Tamblyn R. *Off-label indications for antidepressants in primary care: descriptive study of prescriptions from an indication based electronic prescribing system.* **Bmj** 356:j603, 2017.



#### INFECTIOUS DISEASES AND IMMUNITY IN GLOBAL HEALTH PROGRAM

Battat R, Kopylov U, Bessisow T, Bitton A, Cohen A, Jain A, Martel M, Seidman E, Afif W. *Association Between Ustekinumab Trough Concentrations and Clinical, Biomarker, and Endoscopic*

Outcomes in Patients With Crohn's Disease. **Clin Gastroenterol Hepatol** 15(9):1427-1434 e2, 2017.

Lee RS, Proulx JF, Menzies D, Behr MA. Progression to tuberculosis disease increases with multiple exposures. **Eur Respir J** 48(6):1682-1689, 2016.

Manry J, Nedelec Y, Fava VM, Cobat A, Orlova M, Thuc NV, Thai VH, Laval G, Barreiro LB, Schurr E. Deciphering the genetic control of gene expression following *Mycobacterium leprae* antigen stimulation. **PLoS Genet** 13(8):e1006952, 2017.

Merckx J, Wali R, Schiller I, Caya C, Gore GC, Chartrand C, Dendukuri N, Papenburg J. Diagnostic Accuracy of Novel and Traditional Rapid Tests for Influenza Infection Compared With Reverse Transcriptase Polymerase Chain Reaction: A Systematic Review and Meta-analysis. **Ann Intern Med** 167(6):394-409, 2017.

Pembroke T, Deschenes M, Lebouche B, Benmassaoua A, Sewitch M, Ghali P, Wong P, Halme A, Vuille-Lessard E, Pexos C, Klein MB, Sebastiani G. Hepatic steatosis progresses faster in HIV mono-infected than HIV/HCV co-infected patients and is associated with liver fibrosis. **J Hepatol** 67(4):801-808, 2017.

Snarr BD, Baker P, Bamford NC, Sato Y, Liu H, Lehoux M, Gravelat FN, Ostapska H, Baistrocchi SR, Cerone RP, Filler EE, Parsek MR, Filler SG, Howell PL, Sheppard DC. Microbial glycoside hydrolases as antibiofilm agents with cross-kingdom activity. **Proc Natl Acad Sci U S A** 114(27):7124-7129, 2017.

Van Den Ham KM, Smith LK, Richer MJ, Olivier M. Protein Tyrosine Phosphatase Inhibition Prevents Experimental Cerebral Malaria by Precluding CXCR3 Expression on T Cells. **Sci Rep** 7(1):5478, 2017.

Young J, Rossi C, Gill J, Walmsley S, Cooper C, Cox J, Martel-Laferriere V, Conway B, Pick N, Vachon ML, Klein MB. Risk Factors for Hepatitis C Virus Reinfection After Sustained Virologic Response in Patients Coinfected With HIV. **Clin Infect Dis** 64(9):1154-1162, 2017.



## CANCER RESEARCH PROGRAM

Ghazawi FM, Netchiporouk E, Rahme E, Tsang M, Moreau L, Glassman S, Provost N, Gilbert M, Jean SE, Pehr K, Sasseville D, Litvinov IV. Comprehensive analysis of cutaneous T-cell lymphoma (CTCL) incidence and mortality in Canada reveals changing trends and geographic clustering for this malignancy. **Cancer** 123(18):3550-3567, 2017.

Gowing SD, Chow SC, Cools-Lartigue JJ, Chen CB, Najmeh S, Jiang HY, Bourdeau F, Beauchamp A, Mancini U, Angers I, Giannias B, Spicer JD, Rousseau S, Qureshi ST, Ferri LE. Gram-positive pneumonia augments non-small cell lung cancer metastasis via host toll-like receptor 2 activation. **Int J Cancer** 141(3):561-571, 2017.

He Y, Northey JJ, Pelletier A, Kos Z, Meunier L, Haibe-Kains B, Mes-Masson AM, Cote JF, Siegel PM, Lamarche-Vane N. The *Cdc42/Rac1* regulator *CdGAP* is a novel E-cadherin transcriptional co-repressor with *Zeb2* in breast cancer. **Oncogene** 36(24):3490-3503, 2017.

Ngan E, Stoletov K, Smith HW, Common J, Muller WJ, Lewis JD, Siegel PM. LPP is a Src substrate required for invadopodia formation and efficient breast cancer lung metastasis. **Nat Commun** 8:15059, 2017.

Patterson NH, Alabdulkarim B, Lazaris A, Thomas A, Marcinkiewicz MM, Gao ZH, Vermeulen PB, Chaurand P, Metrakos P. Assessment of

pathological response to therapy using lipid mass spectrometry imaging. **Sci Rep** 6:36814, 2016.

Rivera B, Di Iorio M, Frankum J, Nadaf J, Fahiminiya S, Arcand SL, Burk DL, Grapton D, Tomiak E, Hastings V, Hamel N, Wagener R, Aleynikova O, Giroux S, Hamdan FF, Dionne-Laporte A, Zogopoulos G, Rousseau F, Berghuis AM, Provencher D, Rouleau GA, Michaud JL, Mes-Masson AM, Majewski J, Bens S, Siebert R, Narod SA, Akbari MR, Lord CJ, Tonin PN, Orthwein A, Foulkes WD. Functionally Null *RAD51D* Missense Mutation Associates Strongly with Ovarian Carcinoma. **Cancer Res** 77(16):4517-4529, 2017.

Tian J, Hachim MY, Hachim IY, Dai M, Lo C, Raffa FA, Ali S, Lebrun JJ. Cyclooxygenase-2 regulates TGFbeta-induced cancer stemness in triple-negative breast cancer. **Sci Rep** 7:40258, 2017.

Yan K, Rousseau J, Littlejohn RO, Kiss C, Lehman A, Rosenfeld JA, Stumpel CT, Stegmann AP, Robak L, Scaglia F, Nguyen TT, Fu H, Ajeawung NF, Camurri MV, Li L, Gardham A, Panis B, Almannai M, Sacoto MJ, Baskin B, Ruivenkamp C, Xia F, Bi W, Cho MT, Potjer TP, Santen GW, Parker MJ, Canham N, McKinnon M, Potocki L, MacKenzie JJ, Roeder ER, Campeau PM, Yang XJ. Mutations in the Chromatin Regulator Gene *BRPF1* Cause Syndromic Intellectual Disability and Deficient Histone Acetylation. **Am J Hum Genet** 100(1):91-104, 2017.



## BRAIN REPAIR AND INTEGRATIVE NEUROSCIENCE PROGRAM

Albouy P, Weiss A, Baillet S, Zatorre RJ. Selective Entrainment of Theta Oscillations in the Dorsal Stream Causally Enhances Auditory Working Memory Performance. **Neuron** 94(1):193-206 e5, 2017.

Atkin T, Nunez N, **Gobbi G**. Practitioner Review: The effects of atypical antipsychotics and mood stabilisers in the treatment of depressive symptoms in paediatric bipolar disorder. **J Child Psychol Psychiatry** 58(8):865-879, 2017.

**Farivar R**, Clavagnier S, Hansen BC, Thompson B, **Hess RF**. Non-uniform phase sensitivity in spatial frequency maps of the human visual cortex. **J Physiol** 595(4):1351-1363, 2017.

**Fereshtehnejad SM, Zeighami Y, Dagher A, Postuma RB**. Clinical criteria for subtyping Parkinson's disease: biomarkers and longitudinal progression. **Brain** 140(7):1959-1976, 2017.

**Kaplan A**, Morquette B, Kroner A, Leong S, Madwar C, **Sanz R**, Banerjee SL, **Antel J**, Bisson N, **David S, Fournier AE**. Small-Molecule Stabilization of 14-3-3 Protein-Protein Interactions Stimulates Axon Regeneration. **Neuron** 93(5):1082-1093 e5, 2017.

**Konefal SC, Stellwagen D**. Tumour necrosis factor-mediated homeostatic synaptic plasticity in behavioural models: testing a role in maternal immune activation. **Philos Trans R Soc Lond B Biol Sci** 372(1715), 2017.

**Nguyen TV**, Reuter JM, Gaikwad NW, Rotroff DM, Kucera HR, Motsinger-Reif A, Smith CP, Nieman LK, Rubinow DR, Kaddurah-Daouk R, Schmidt PJ. The steroid metabolome in women with premenstrual dysphoric disorder during GnRH agonist-induced ovarian suppression: effects of estradiol and progesterone addback. **Transl Psychiatry** 7(8):e1193, 2017.

**Sugiura A, Mattie S**, Prudent J, **McBride HM**. Newly born peroxisomes are a hybrid of mitochondrial and ER-derived pre-peroxisomes. **Nature** 542(7640):251-254, 2017.



**TRANSLATIONAL RESEARCH IN RESPIRATORY DISEASES PROGRAM**

**Ahmad Khan F**, Salim MAH, du Cros P, Casas EC, Khamraev A, Sikhondze W, **Benedetti A**, Bastos M, Lan Z, Jaramillo E, Falzon D, **Menzies D**. Effectiveness and safety of standardised shorter regimens for multidrug-resistant tuberculosis: individual patient data and aggregate data meta-analyses. **Eur Respir J** 50(1), 2017.

**Ano S, Panariti A, Allard B, O'Sullivan M, McGovern TK, Hamamoto Y, Ishii Y, Yamamoto M, Powell WS, Martin JG**. Inflammation and airway hyperresponsiveness after chlorine exposure are prolonged by Nrf2 deficiency in mice. **Free Radic Biol Med** 102:1-15, 2017.

**Downey J, Pernet E**, Coulombe F, **Allard B, Meunier I**, Jaworska J, **Qureshi S**, Vinh DC, **Martin JG**, Joubert P, **Divangahi M**. RIPK3 interacts with MAVS to regulate type I IFN-mediated immunity to Influenza A virus infection. **PLoS Pathog** 13(4):e1006326, 2017.

Gegia M, Winters N, **Benedetti A**, van Soolingen D, **Menzies D**. Treatment of isoniazid-resistant tuberculosis with first-line drugs: a systematic review and meta-analysis. **Lancet Infect Dis** 17(2):223-234, 2017.

**Iu M**, Zago M, Rico de Souza A, Bouttier M, **Pareek S**, White JH, **Hamid Q, Eidelman DH, Baglole CJ**. RelB attenuates cigarette smoke extract-induced apoptosis in association with transcriptional regulation of the aryl hydrocarbon receptor. **Free Radic Biol Med** 108:19-31, 2017.

Mery VP, Gros P, Lafontaine AL, Robinson A, **Benedetti A, Kimoff RJ, Kaminska M**.

Reduced cognitive function in patients with Parkinson disease and obstructive sleep apnea. **Neurology** 88(12):1120-1128, 2017.

Quanjer PH, Ruppel GL, Langhammer A, Krishna A, Mertens F, Johannessen A, Menezes AMB, Wehrmeister FC, Perez-Padilla R, Swanney MP, Tan WC, **Bourbeau J**. Bronchodilator Response in FVC Is Larger and More Relevant Than in FEV1 in Severe Airflow Obstruction. **Chest** 151(5):1088-1098, 2017.

**Stana F**, Vujovic M, Mayaki D, Leduc-Gaudet JP, Leblanc P, Huck L, **Hussain SNA**. Differential Regulation of the Autophagy and Proteasome Pathways in Skeletal Muscles in Sepsis. **Crit Care Med** 45(9):e971-e979, 2017.



**CARDIOVASCULAR HEALTH ACROSS THE LIFESPAN PROGRAM**

**Afilalo J**, Lauck S, Kim DH, Lefevre T, **Piazza N**, Lachapelle K, Martucci G, Lamy A, Labinaz M, Peterson MD, Arora RC, Noiseux N, Rassi A, Palacios IF, Genereux P, Lindman BR, Asgar AW, Kim CA, Trnkus A, **Morais JA**, Langlois Y, Rudski LG, Morin JF, Popma JJ, Webb JG, Perrault LP. Frailty in Older Adults Undergoing Aortic Valve Replacement: The FRAILTY-AVR Study. **J Am Coll Cardiol** 70(6):689-700, 2017.

Afshar M, Luk K, Do R, Dufresne L, Owens DS, Harris TB, Peloso GM, Kerr KF, Wong Q, Smith AV, Budoff MJ, Rotter JJ, Cupples LA, Rich SS, **Engert JC**, Gudnason V, O'Donnell CJ, Post WS, **Thanassoulis G**. Association of Triglyceride-Related Genetic Variants With Mitral Annular Calcification. **J Am Coll Cardiol** 69(24):2941-2948, 2017.

Albanese I, Yu B, Al-Kindi H, Barratt B, Ott L, Al-Refai M, **de Varennes B, Shum-Tim D**, Cerruti M, Gourgas O, Rheaume





E, Tardif JC, **Schwertani A**. *Role of Noncanonical Wnt Signaling Pathway in Human Aortic Valve Calcification*. **Arterioscler Thromb Vasc Biol** 37(3):543-552, 2017.

Azzalini L, Dautov R, Ojeda S, Benincasa S, Bellini B, Giannini F, Chavarria J, Pan M, Carlino M, Colombo A, **Rinfret S**. *Procedural and Long-Term Outcomes of Percutaneous Coronary Intervention for In-Stent Chronic Total Occlusion*. **JACC Cardiovasc Interv** 10(9):892-902, 2017.

**Bally M**, Dendukuri N, Rich B, Nadeau L, Helin-Salmivaara A, Garbe E, **Brophy JM**. *Risk of acute myocardial infarction with NSAIDs in real world use: bayesian meta-analysis of individual patient data*. **Bmj** 357:j1909, 2017.

Burstein B, **Barbosa RS**, Kalfon E, Joza J, Bernier M, **Essebag V**. *Venous Thrombosis after Electrophysiology Procedures: A Systematic Review*. **Chest** 152(3):574-586, 2017.

**Dayan N**, Filion KB, Okano M, Kilmartin C, Reinblatt S, Landry T, **Basso O**, Udell JA. *Cardiovascular Risk Following Fertility Therapy: Systematic Review and Meta-Analysis*. **J Am Coll Cardiol** 70(10):1203-1213, 2017.

Khan NA, **Daskalopoulou SS**, Karp I, Eisenberg MJ, **Pelletier R**, Tsadok MA, **Dasgupta K**, **Norris CM**, **Pilote L**. *Sex differences in prodromal symptoms in acute coronary syndrome in patients aged 55 years or younger*. **Heart** 103(11):863-869, 2017.



## CHILD HEALTH AND HUMAN DEVELOPMENT PROGRAM

**Bahous RH**, Jadavji NM, Deng L, Cosin-Tomas M, Lu J, Malysheva O, Leung KY, Ho MK, Pallas M, Kaliman P, Greene NDE, **Bedell BJ**, Caudill MA, **Rozen R**. *High dietary folate in pregnant mice leads to pseudo-MTHFR deficiency and altered methyl metabolism, with embryonic growth delay and short-term memory impairment in offspring*. **Hum Mol Genet** 26(5):888-900, 2017.

**Goodyer CG**, Poon S, Aleksa K, **Hou L**, Atehortua V, Carnevale A, **Jednak R**, **Emil S**, Bagli D, Dave S, Hales BF, Chevrier J. *A Case-Control Study of Maternal Polybrominated Diphenyl Ether (PBDE) Exposure and Cryptorchidism in Canadian Populations*. **Environ Health Perspect** 125(5):057004, 2017.

**Hechtman L**, Swanson JM, Sibley MH, Stehli A, Owens EB, Mitchell JT, Arnold LE, Molina BS, Hinshaw SP, Jensen PS, Abikoff HB, Perez Algorta G, Howard AL, Hoza B, Etcovitch J, Houssais S, Lakes KD, Nichols JQ. *Functional Adult Outcomes 16 Years after Childhood Diagnosis of Attention-Deficit/Hyperactivity Disorder: MTA Results*. **J Am Acad Child Adolesc Psychiatry** 55(11):945-952 e2, 2016.

Kuentz P, St-Onge J, Duffourd Y, Courcet JB, Carmignac V, Jouan T, Sorlin A, Abasq-Thomas C, Albuisson J, Amiel J, Amram D, Arpin S, Attie-Bitach T, Bahi-Buisson N, Barbarot S, Baujat G, Bessis D, Boccara O, Bonniere M, Boute O, Bursztejn AC, Chiaverini C, Cormier-Daire V, Coubes C, Delobel B, Edery P, Chehadeh SE, Francannet C, Genevieve D, Goldenberg A, Haye D, Isidor B, Jacquemont ML, Khau Van Kien P, Lacombe D, Martin L, Martinovic J, Maruani A, Mathieu-Dramard M, Mazereeuw-Hautier J, Michot C, Mignot C, Miquel J,

Morice-Picard F, Petit F, Phan A, Rossi M, Touraine R, Verloes A, Vincent M, Vincent-Delorme C, Whalen S, Willems M, Marle N, Lehalle D, Thevenon J, Thauvin-Robinet C, Hadj-Rabia S, Faivre L, Vabres P, **Riviere JB**. *Molecular diagnosis of PIK3CA-related overgrowth spectrum (PROS) in 162 patients and recommendations for genetic testing*. **Genet Med** 19(9):989-997, 2017.

Li M, Beauchemin H, Popovic N, Peterson A, d'Hennezel E, **Piccirillo CA**, Sun C, **Polychronakos C**. *The common, autoimmunity-predisposing 620Arg > Trp variant of PTPN22 modulates macrophage function and morphology*. **J Autoimmun** 79:74-83, 2017.

Lisonkova S, Potts J, Muraca GM, Razaz N, Sabr Y, Chan WS, **Kramer MS**. *Maternal age and severe maternal morbidity: A population-based retrospective cohort study*. **PLoS Med** 14(5):e1002307, 2017.

**Papillon-Cavanagh S**, Lu C, **Gayden T**, Mikael LG, **Bechet D**, Karamboulas C, Ailles L, Karamchandani J, Marchione DM, Garcia BA, Weinreb I, Goldstein D, Lewis PW, Dancu OM, Dhaliwal S, Stecho W, Howlett CJ, Mymryk JS, Barrett JW, Nichols AC, Allis CD, **Majewski J**, **Jabado N**. *Impaired H3K36 methylation defines a subset of head and neck squamous cell carcinomas*. **Nat Genet** 49(2):180-185, 2017.

**Whidden L**, Martel J, **Rahimi S**, Chaillet JR, Chan D, **Trasler JM**. *Compromised oocyte quality and assisted reproduction contribute to sex-specific effects on offspring outcomes and epigenetic patterning*. **Hum Mol Genet** 25(21):4649-4660, 2016.

<b>INSTITUTIONAL GRANTS</b>	<b>2016-2017</b> \$
Fonds de recherche du Québec–Santé (FRQS)	4,411,972
Research Support Fund (Government of Canada)	4,535,471
McGill University Health Centre (MUHC) Foundations	1,405,703
Other revenues	5,590,671
Canada Foundation for Innovation—Research Hospital Fund	33,659,144
<b>TOTAL</b>	<b>49,602,961</b>

<b>RESEARCH PROJECTS</b>	<b>2016-2017</b> \$
Canadian Institutes of Health Research (CIHR)	51,707,838
Industry	18,292,577
Other (various granting agencies)	15,528,744
MUHC (including Foundations) and McGill University	12,393,978
Génome Québec and Genome Canada	9,157,197
Canada Foundation for Innovation	9,030,989
Fonds de recherche du Québec–Santé (FRQS)	6,605,406
Natural Sciences and Engineering Research Council of Canada	4,470,568
Brain Canada Foundation	4,360,311
Ministère de l'Éducation et de l'Enseignement supérieur du Québec	3,654,588
National Institutes of Health	3,361,809
Canada Research Chairs	2,600,000

## OUR WORLDWIDE NETWORK

Ongoing research collaborations with **51** countries



RESEARCH PROJECTS CONT'D	2016-2017 \$
US Department of Defense	2,555,414
Consortium québécois sur la découverte du médicament	1,331,492
Terry Fox Foundation	1,072,107
Networks of Centres of Excellence of Canada	855,708
Canadian Partnership Against Cancer	838,722
Mutiple Sclerosis Society of Canada	806,962
Costello Bequest Foundation	673,366
Public Health Agency of Canada	671,104
Canadian Cancer Society Research Institute	624,279
PROCURE—The Force Against Prostate Cancer	539,766
Cystic Fibrosis Canada	524,438
Prostate Cancer Canada	499,105
MITACS	487,999
Quebec Breast Cancer Foundation	430,355
Richard and Edith Strauss Canada Foundation	400,000
Michael J. Fox Foundation	387,049
Amyotrophic Lateral Sclerosis (ALS) Society of Canada	356,219
European Commission	352,883
<b>TOTAL</b>	<b>154,570,972</b>
<b>TOTAL FUNDING</b>	<b>204,173,933</b>



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## At the Research Institute of the McGill University Health Centre (RI-MUHC), our innovations bring real change to health care.

### More than a research hospital: A hospital driven by research!

We are deeply grateful to our foresighted donors and volunteers, and to the foundations and auxiliaries affiliated with the McGill University Health Centre (MUHC). Together, we have the means to leverage discovery aimed at improving the health of individual patients across their lifespan.

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[muhc.ca/cause](http://muhc.ca/cause)



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The Arbeiter family fundraising for the Cellular Therapy Laboratory



Cancer Research Program trainees and staff

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*Doctors have the power to heal...  
but researchers have the power to cure*

### Be part of the discovery!

"Your support can help our researchers change the outcome of an illness—potentially for someone you love."

—Dr. Bruce Mazer

<https://www.muhc.foundation.com/current-projects/discovery-club/>





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