



L'Institut de recherche
du Centre universitaire de santé McGill
The Research Institute
of the McGill University Health Centre

Annual Report 2010 - 2011

Research is in our Blood







Table of Contents

Message from the Executive Director and Chief Scientific Officer, Research Institute of the MUHC.....	4
Message from the Chairman of the Board, Research Institute of the MUHC	5
Message from the Director General and Chief Executive Officer, MUHC.....	6
Message from the Chairman of the Board, MUHC.....	7
Awards and Recognition.....	8
Personnel Awards.....	9
Research at the New MUHC – Glen Campus	10
Administration and Management	12
Research Axes.....	14
Cancer.....	16
Cardiovascular Diseases and Critical Care.....	18
Endocrinology, Diabetes, Nutrition and Kidney Diseases.....	20
Health Outcomes	22
Human Reproduction and Development	24
Infection and Immunity.....	26
Medical Genetics and Genomics.....	28
Mental Illness and Addiction.....	30
Musculoskeletal Disorders	32
Neurosciences.....	34
Respiratory Health	36
List of Regular and Associate Researchers by axis.....	38
World Firsts	40
Business Development	42
Support from Foundations and Auxiliaries.....	43
Selected Representative Publications.....	45
New Recruits	49
Core Facilities	50
Funding by Source	52
Financials – Quick Stats	53
Internal Committees.....	54

Message from the Executive Director and Chief Scientific Officer The Research Institute of the MUHC



The RI-MUHC is home to Canada's largest concentration of medical and health care research investigators. It brings together over 600 researchers from around the world.

Research is in our blood. This is the only way to portray the complete commitment that I find in my colleagues at the Research Institute of the McGill University Health Centre (RI MUHC). Their omnipresent passion for research, which I have witnessed on a daily basis since the beginning of my mandate four years ago, gives me an unshakable confidence that our future is bright.

The RI-MUHC is at the pinnacle of over a decade of planning to bridge the gap between biomedical research and clinical care, putting us in a position to dramatically improve our capacity for groundbreaking research at the MUHC.

Thanks to an unprecedented level of funding of over \$150 million and an internationally recognized team renowned for their expertise, we were able, once again, to tackle huge scientific challenges in order to improve patient's health and pave the way to more personalized medicine.

Medical research is at an historical turning point, and we will be at the forefront — transforming the way hospital-based research is conducted and patient care delivered, while giving patients the information needed to make health-related decisions that can have a measurable impact on their quality of life and longevity.

To accomplish our goals, we will continue building on our strengths and exploring new avenues to maximize the efficiency of our operations. We will focus on innovation, share our discoveries with the world and, continue to push the boundaries of clinical and scientific knowledge, further entrenching our leadership at home and abroad. In just a few short years, we have revamped our organizational structure and streamlined operations to prepare us for the transition of the MUHC's redevelopment project.

I thank all of the members of our team for their unwavering support and dedication to making the RI-MUHC what it is today and will be tomorrow. I also thank our collaborators at the MUHC, McGill University, our hospital foundations, our Board of Directors and our many other partners, for their trust and their help. Finally, I want to acknowledge the exceptional contribution of Brian Baxter as Chairman of our Board of Directors. For four years Brian has stood steadfast to our plans and challenges, and helped to cement our success.

When I look back at everything we have accomplished over the past four years, I cannot help but admire the talent of our team and our researchers. It is with this continued enthusiasm that I anticipate the start of my second, four-year term with the RI-MUHC.

Vassilios Papadopoulos, D.Pharm., Ph.D.
Executive Director and Chief Scientific Officer
The Research Institute of the MUHC
Associate Executive Director for Research
MUHC

Message from the Chairman of the Board The Research Institute of the MUHC

The past year was once again a period of success and growth for The RI-MUHC, as our talented investigators secured record amounts of research funding and continued to challenge the frontiers of medical knowledge. This annual report, entitled “Research is in our Blood”, provides a brief overview of the excellent results achieved by The RI-MUHC’s extraordinary team of dedicated researchers and staff.

This remarkable performance was achieved in what continues to be a challenging and constrained founding environment. I congratulate The RI-MUHC’s management team, led by Executive Director Dr. Vassilios Papadopoulos, and assisted by General Manager and Chief Administrative Officer François Schubert, for achieving strong growth while continuing their efforts to rationalize operations and maximize efficiency.

I would also like to take this opportunity to thank Dr. Papadopoulos for accepting a new four-year term as head of the Institute, and to recognize his vision and energy, which have helped secure The RI-MUHC’s position as a leading international research centre.

In parallel with management’s efforts to streamline the Institutes’ operations, this past year the Board of Directors has worked to realign The RI-MUHC’s governance structures to ensure the closest possible collaboration between the Institute and the MUHC. This transformation, which should be completed in the first half of 2011-2012, will favourably position the Institute for continued growth in the heart of the MUHC structure.

I look forward to the coming year, confident that The RI-MUHC will continue to build on its current success.

Brian Baxter

Chairman

Board of Directors

The Research Institute of the MUHC



**This remarkable performance
was achieved in what
continues to be a challenging
and constrained founding
environment.**

Message from the Director General and Chief Executive Officer McGill University Health Centre



Research is our future's well-spring, and The RI-MUHC has never been better positioned to make a positive impact on the lives of Quebecers, Canadians and people on every part of our planet.

When I reflect on the past year, I immediately think about the countless decisions that our professionals and partners are making with the singular purpose in mind of transforming health care for today's population and generations to come. That The RI-MUHC has chosen **Research is in our blood** as its annual report theme is suggestive of the well-spring that is our future: inquisitive, talented and dedicated researchers, as well as visionary leaders, working around the clock to improve the health outcomes of patients and acquire the evidence required to shape better clinical and lifestyle practices.

Leading The RI-MUHC for a second four-year term, and thus assuring continuity for the integration of research and clinical care that is so vital to the redevelopment of the McGill University Health Centre (MUHC), is Dr. Vassilios Papadopoulos. An esteemed scientist whose proactive nature has earned him the respect of peers and officials alike, Dr. Papadopoulos understands the infrastructure and funding mechanisms needed to run an ambitious research enterprise. During his first term, his *savoir-faire* led us to: appoint François Schubert and thus bring national and international expertise to the newly-created position of General Manager; secure the historic Canada Foundation for Innovation grant, which combined with the Québec government's matching grant and *The Best Care for Life* Campaign funds, will allow us to achieve our vision for translational research and intervention across the lifespan; develop strategic relationships and partnerships on six continents; and establish the more cohesive business approach that today's life-sciences sector demands. I firmly believe that the coming years will be just as successful.

As I prepare to pass my MUHC Director General and CEO's baton to a new leader in spring 2012, I do so with the immense satisfaction of knowing that our redevelopment is now well underway. Furthermore, we are not standing idle whilst awaiting our new facilities. Indeed, the important administrative and governance changes that we've already made are helping us develop a more focused and accountable organization with greater synergies amongst The RI-MUHC, the MUHC and McGill University.

Research is our future's well-spring, and The RI-MUHC has never been better positioned to make a positive impact on the lives of Quebecers, Canadians and people in every part of our planet. I would like to thank Dr. Papadopoulos, Mr. Schubert and Mr. Brian Baxter, the Chairman of the Board, for their leadership. I also applaud our researchers for their latest achievements and encourage them to pursue the excellence that brings more global acclaim to our institution and to the City of Montréal as a world-class life-sciences hub.

The Honourable Arthur T. Porter, P.C. MD
Director General and Chief Executive Officer
McGill University Health Centre

Message from the Chairman of the Board McGill University Health Centre

I am pleased to have an opportunity once again to publicly recognize the extraordinary contributions of the Research Institute of the MUHC (The RI-MUHC) to the quadripartite mission — patient care, teaching, research and technology evaluation — of the McGill University Health Centre (MUHC).

For many years, the efforts and discoveries of our MUHC researchers have enriched our understanding of life sciences, informed health policy and practices, and led to dramatic advances in the prevention, diagnosis and treatment of a plethora of diseases and conditions. Furthermore, gauging from the glimpse into the affairs of The RI-MUHC that this annual report provides, it is clear that the 2010-11 year has been no exception.

I thus extend my sincere congratulations to our researchers on their outstanding accomplishments. Their resourcefulness, skill and commitment to local, national and international collaboration never fail to impress me and my colleagues on the MUHC Board of Directors. I would also like to commend the administrative team responsible for creating and maintaining the environment that has been conducive to attracting and retaining prodigious talent, securing the grants so vitally necessary for such a dynamic research enterprise, and implementing the changes that are preparing The RI-MUHC and MUHC to become even closer partners, joined by their common pursuit of excellence. Finally, in my capacity as Chairman of the MUHC Board, I would like to thank The RI-MUHC Board of Directors under the dedicated chairmanship of Brian Baxter. Boards play an essential role in an organization's success and it is rewarding, particularly for volunteer board members in the healthcare sector, to see their organization flourish.

It has been said that it takes a village to raise a child. I believe the same might be said about The RI-MUHC because there are many people working to provide leadership, support and strategic guidance; to weather the storms, celebrate growth and inspire *The Best Care for Life*.

The Hon. W. David Angus, Q.C., Ad. E.
Chairman
Board of Directors
McGill University Health Centre



**For many years,
the efforts and discoveries
of our researchers
have enriched
our understanding
of life sciences.**

Awards and Recognition

Dr. John Bergeron, Endocrinology, Diabetes, Nutrition and Kidney Diseases, received the HUPO Discovery Award in Proteomics Sciences for 2010. Dr. Bergeron also received the Canadian National Proteomics Network Award for Outstanding Contribution and Leadership to the Canadian Proteomics Community. This award recognizes singular or life time achievement that has had a significant impact on the fundamental understanding and/or practice of proteomics in biological sciences.

Dr. Sasha R Bernatsky, Health Outcomes, received the Consumer Research Award from the Canadian Arthritis Network.

Dr. Alain Bitton, Infection and Immunity, received the Teacher of the Year Award, voted by GI residents.

Dr. Ciaran Duffy, Health Outcomes, received the Jeff Shiroky Award at the Laurentian Conference of Rheumatology.

Dr. Gerald Fried, Health Outcomes, received the SAGES Distinguished Service Award for his significant, long-term educational, research, clinical and/or technological contribution to the field of surgical endoscopy. SAGES represents a worldwide community of surgeons that can bring minimal access surgery, endoscopy and emerging techniques to patients in every country.

Dr. Kathleen Glass was awarded a Lifetime Achievement Award from the Canadian Bioethics Society in 2011.

Dr. David Goltzman, Musculoskeletal Disorders, received the Christie Award from the Canadian Association of Professors of Medicine. Dr. Goltzman also received the Lawrence G. Raisz Award from the American Society for Bone and Mineral Research. The award is given to an individual having a record of outstanding achievements in preclinical translational research (cellular or in animals) in the bone and mineral field.

Dr. Edith Hamel, Neurosciences, received the 2010 Roy and Sherrington Award for the Gordon Research Conference on Brain Energy Metabolism and Blood Flow, Proctor Academy.

Dr. Barbara Jones, Neurosciences, was elected a Fellow of the Royal Society of Canada. Dr. Jones is known worldwide for her life's work elucidating the basic mechanisms of sleep-wake states. She has delineated by their chemical neurotransmitters, neuroanatomical projections and discharge properties, the major neural systems that generate the three distinct states of waking, slow-wave sleep and rapid eye movement (REM) sleep.

Dr. Michael S. Kramer was the 2010 recipient of the Paediatric Academic Leadership–Clinical Investigator Award from the Pediatric Chairs of Canada. The award recognized his administrative leadership in the child health research community in Canada and his prominent role in influencing child health globally.

Dr. Serge Lemay, Endocrinology, Diabetes, Nutrition and Kidney Diseases, was recognized as a “Guardian Angel” by the Royal Victoria Hospital Foundation.

Dr. Dick Menzies, Health Outcomes, was recognized by the North-America Region of the International Union Against Tuberculosis and Lung Disease (IUATLD) for Outstanding Service.

Dr. Michael Petrides, Neurosciences, was awarded the Principal's Prize for Excellence in Teaching from McGill University.

Dr. I. Barry Pless was the recipient of the 2010 Emeritus Researcher Award from the Québec Population Health Research Network for his exceptional contribution to the field, not only in Québec, but nationally and internationally.

Dr. Janusz Rak, Cancer, received the 2010 Aldo Award of Excellence in Research from The Montreal Children's Hospital Foundation.

Dr. Simon Rousseau, Infection and Immunity, received the Robbie Promising New Research Award from Cystic Fibrosis Canada.

Dr. Rima Rozen was elected Fellow of the Royal Society of Canada. Dr. Rozen is internationally recognized for her work on the genetics of several disorders, including birth defects, heart disease and inborn errors of metabolism.

Dr. Christos Tsoukas, Infection and Immunity, received the Anna-Maria Solinas-Laroche Distinguished Scientist Distinction in immunology.

Personnel Awards

Canada Research Chairs 2010-2011

Tier 1 (Renewal)

Dr. Bartha Maria Knoppers
Medical Genetics and Genomics

Tier 2 (Renewal)

Dr. David Buckeridge
Health Outcomes

Dr. Christopher Pack
Neurosciences

Dr. Edward Ruthazer
Neurosciences

Salary Awards

CIHR Clinician Scientist Phase 2 – Renewal

Dr. Vidal Essebag
Health Outcomes

CIHR New Investigator

Dr. Nitika Pai
Infection and Immunity

Dr. David Stellwagen
Neurosciences

FRSQ Chercheurs nationaux

Dr. Andrea Bernasconi
Neurosciences

Dr. Edward A. Fon
Neurosciences

FRSQ Chercheurs-boursiers – Junior 2

Dr. Lesley Fellows
Neurosciences

Dr. Maia Kokoeva
Endocrinology, Diabetes, Nutrition
and Kidney Diseases

Dr. Cristian O'Flaherty
Human Reproduction
and Development

Dr. Christian Rocheleau
Cancer

Dr. Maya Saleh
Cancer

Dr. Maida Sewitch
Health Outcomes

FRSQ Chercheurs-boursiers – Junior 1

Dr. Cristian O'Flaherty
Human Reproduction and
Development

Dr. Petra Schweinhardt
Neurosciences

Dr. Sonia Semenic
Human Reproduction and
Development

FRSQ Chercheurs-boursiers cliniciens – Senior

Dr. Mark Ware
Neurosciences

FRSQ Chercheurs-boursiers cliniciens – Junior 2

Dr. Jean Ouellet
Musculoskeletal Disorders

FRSQ Chercheurs-boursiers cliniciens – Junior 1

Dr. Ari-Nareg Meguerditchian
Cancer

Dr. Suzanne Morin
Musculoskeletal Disorders

Dr. Chantal Séguin
Medical Genetics and Genomics

William Dawson Scholars

Dr. Philip Barker
Cancer

Dr. Amit Bar-Or
Neurosciences

Research at the New MUHC

The Research Institute



Artistic rendering



The future RI-MUHC / Artistic rendering

Research will play a central role at the Glen Campus, the Montreal General Hospital and Lachine Campus of the New MUHC. Our scientists will have more than 40,000 square metres of ultramodern facilities that will be the envy of their colleagues the world over. With the bulk of Research Institute activities moved to the Glen Campus, researchers will be close to clinicians and patients, which will promote collaboration and translational research.

Glen Campus

Centre for Innovative Medicine (CIM)



Flexible work spaces will be created based on researchers' needs. Laboratories will have cutting-edge equipment and medical technologies to help researchers perform advanced analyses and collaborate with their colleagues around the world.

These new facilities will include the Centre for Innovative Medicine, which will specialize in clinical trials to let MUHC researchers translate their most promising discoveries into new treatments.

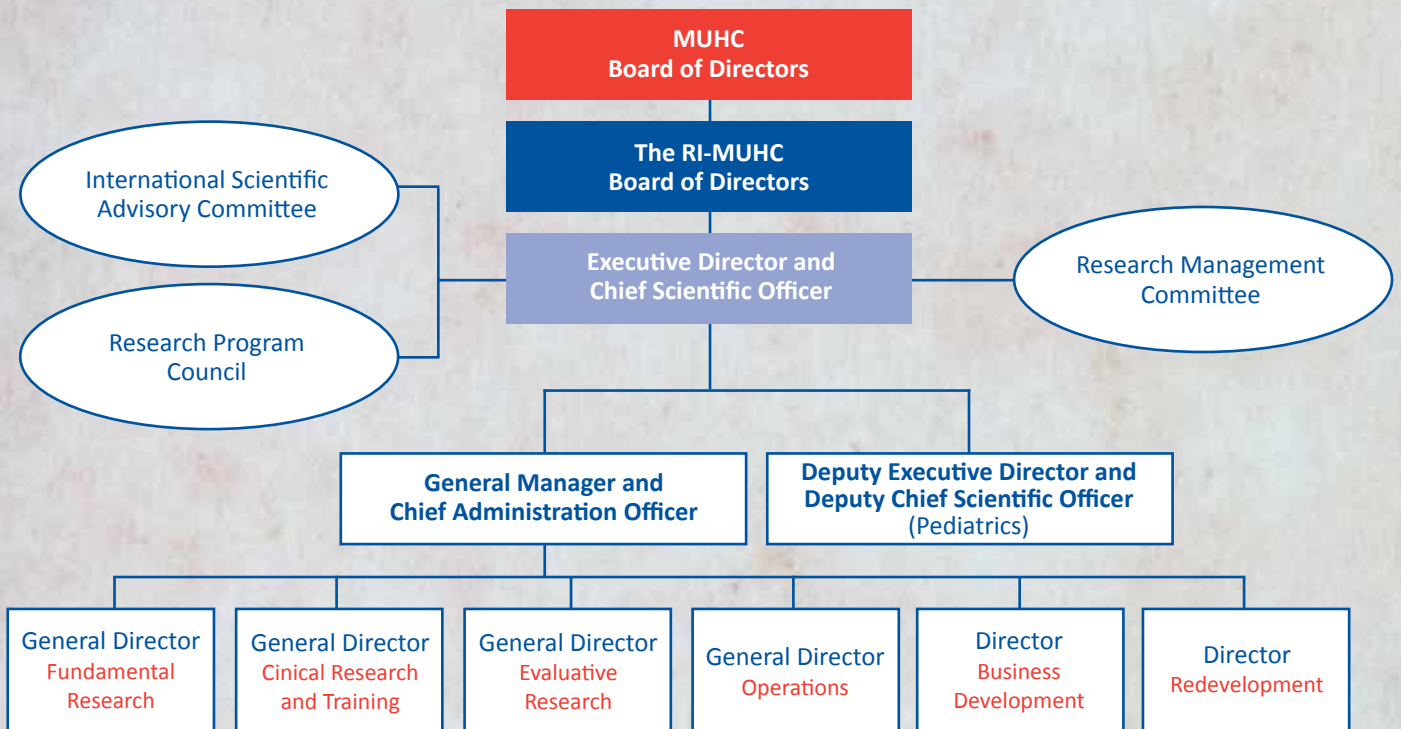
Thanks to the Centre for Translational Biology, researchers will be able to apply the discoveries in genetics and epigenetics to major medical problems, such as congenital defects in children.

The construction of research facilities at the Glen Campus will be made possible thanks to a generous grant of \$100 million from the Canada Foundation for Innovation, supplemented by \$100 million from the Government of Québec and \$50 million from donors.



L'Institut
du Centre
de Recherche
en Santé
The Role
of the

The RI-MUHC Governance Structure



Setting the Tone for Ongoing Improvement

Administrative goals are grounded in the Institute's strategic plan

The Research Institute of the McGill University Health Centre is strongly committed to pursuing institutional and organizational effectiveness. Many ongoing initiatives are focused on improving all aspects of the services, processes and systems that support the mission of the Institute, while helping it move from an entrepreneurial philosophy to a more business-like model. As a result, the Institute will be better-equipped and organized to face the challenging environment ahead.

Initially, our priorities were established through a four-year strategic plan. Many of these affected the Institute as a whole, and were key to reducing the administrative burden, improving services, enhancing the existing knowledgeable administrative workforce, fostering an effective organizational structure, as well as identifying and providing tools and systems that support the Institute's staff and researchers. In addition, as part of the MUHC Redevelopment Project, The RI-MUHC will move to a single harmonized operation as opposed to the current five distinct operations.

Amongst several other initiatives undertaken, here are a few examples of the efforts deployed over the past few years:

- ◆ Reorganization of all department operations to streamline operations and improve efficiency and customer services;
- ◆ Implementation of standard operating procedures across all sites with increased emphasis on automation;
- ◆ Implementation of revenue generation activities through the creation of a Business Development office;
- ◆ Improvement of several added-value services to researchers, such as clinical contracts, scientific review as well as grants and data management;
- ◆ Involvement at various levels of the ongoing Redevelopment Project (Glen Campus).

Improvement efforts are a partnership between administrative, academic and our research community. The ultimate objective is to create a sustainable framework strengthening the efficiency of administrative activities performed at the Institute.



François Schubert
General Manager and
Chief Administrative
Officer



Dr. Jacquetta Trasler
Deputy Executive
Director and Deputy
Chief Scientific Officer
(Pediatrics)

Our Research Axes

- Cancer
- Cardiovascular Diseases and Critical Care
- Endocrinology, Diabetes, Nutrition and Kidney Diseases
- Health Outcomes
- Human Reproduction and Development
- Infection and Immunity
- Medical Genetics and Genomics
- Mental Illness and Addiction
- Musculoskeletal Disorders
- Neurosciences
- Respiratory Health



Focused Research and Collaboration

Research offers the promise of finding better ways to diagnose and treat disease. To reach these goals, investigators must often focus on very specific questions. To facilitate focus while encouraging collaboration across research disciplines at The Research Institute is organized into 11 axes or programs

Axes span the spectrum of medical research

Some of our axes are dedicated to research into specific diseases such as cancer, respiratory illness and cardiovascular disease. Others are focused on the study of genetics, genomics and health outcomes – areas of science which are relevant across the broader spectrum of health care. Researchers work with colleagues in other axes, forming multidisciplinary teams to study the many complex questions confronting modern medicine.

Cancer

Leaders

67 members

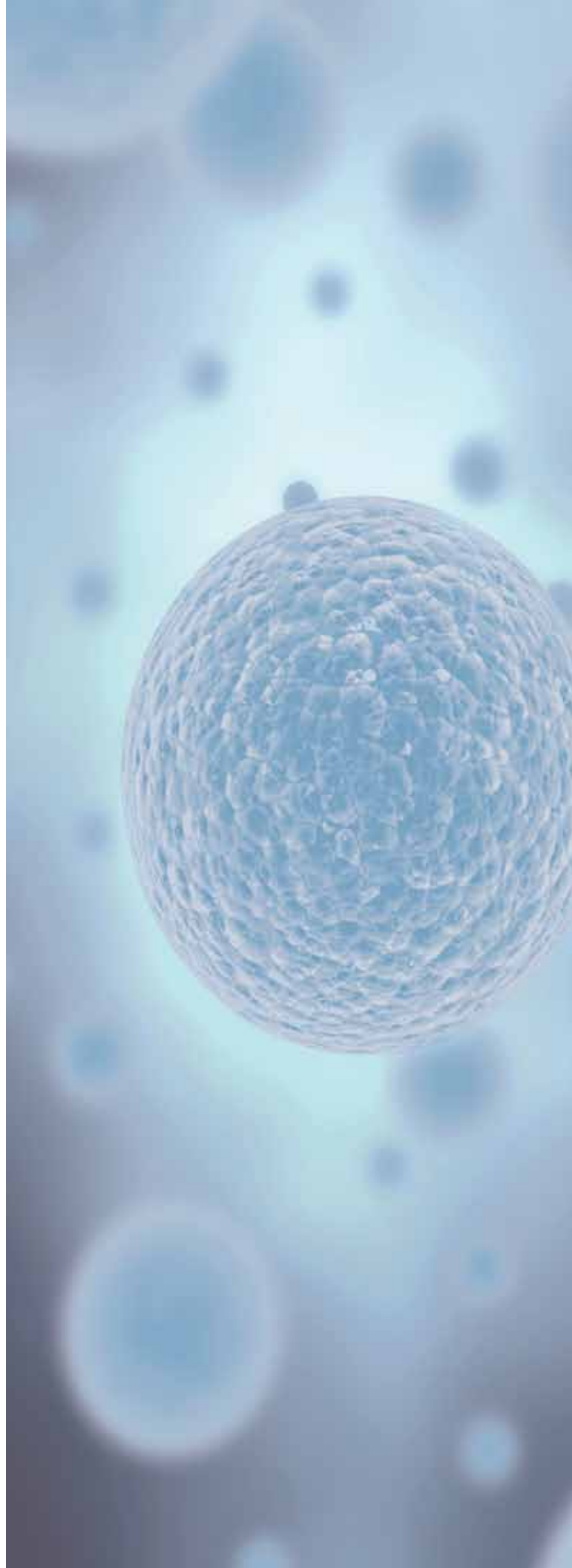
Pnina Brodt, PhD
Patricia N. Tonin, PhD

Research in the Cancer Axis focuses on the cause and prognosis of cancers from infancy to adulthood. The Axis has developed translational strengths in four areas – breast, prostate, melanoma and colon cancer – that are global public health concerns and represent a major clinical burden on the healthcare system.

As a designated breast cancer and melanoma referral center for Québec, members of this Axis, in conjunction with the UROMED Prostate Cancer Center, have investigated and refined the diagnostic and prognostic tools for breast and prostate cancer and melanoma. This research has led to the development of technology to identify genetic signatures of cancer, which can be used to predict, prevent and personalize medicine.

Research in this Axis contributes to the improvement of quality of life and the provision of optimal palliative care at all stages of disease. Researchers from the Cancer Axis have received international recognition for the development of quality of life measures for palliative care patients and their families.

The research currently pursued by Cancer Axis scientists can be grouped into five major thematic programs with distinct, yet complementary, strengths that collectively examine different aspects of the process of cancer progression and dissemination. These programs will be the investigational backbone of the Cancer Axis, allowing us to identify areas to be strengthened through new recruits or intra-and inter-team collaborations.



World First

Robots helping doctors to perform to the highest standards

In a world first, a completely robotic surgery and anesthesia were recently performed at the McGill University Health Centre (MUHC). The DaVinci surgical robot, which lets surgeons work from remote locations, was put to work during the summer of 2010. The anesthesia robot, nicknamed McSleepy, has been providing automated anesthesia since 2008. The two combined to perform the first-ever all-robotic surgery on a prostatectomy patient at the Montreal General Hospital.

For Dr. Thomas M. Hemmerling, MUHC's Department of Anesthesia and The RI-MUHC neuroscience researcher, collaboration between surgical and anesthetic robots was an obvious fit to provide health care of higher safety and precision. On one side, automated anesthesia delivery via McSleepy guarantees the same high quality of care every time it is used, independent from subjective levels of expertise. It can be configured exactly to the specific needs of different surgeries, such as robotic surgery. On the other, as explained by Dr. Armen Aprikian, MUHC Urologist in Chief, Director of the MUHC Cancer Care Mission and Researcher in the Cancer Axis at The RI-MUHC, the DaVinci allows us to work from a workstation operating surgical instruments with delicate movements of our fingers with precision that cannot be provided by humans alone. He and his team of surgeons operate the robotic arms from a dedicated workstation via video control with unsurpassed 3D HD image quality.

By combining both robots, these specialists can now deliver the most modern and effective patient care. The researchers will use the results of this project to test all robotic surgery and anesthesia in a larger scale population of patients and across various types of surgery.



Dr. Thomas M. Hemmerling and Dr. Armen Aprikian





Cardiovascular Diseases and Critical Care

Leaders

Jacques Genest, MD
Sheldon Magder, MD

57 members

The Cardiovascular Disease and Critical Care Axis is dedicated to the understanding and treatment of cardiovascular diseases, which represent the major cause of death and disability in both Canada and around the world. The major research focus of the Axis involves lipoprotein metabolism and cardiovascular genetics, vascular biology and response to inflammatory stress, cellular and mathematical models for the study of cardiac electrophysiology, and assessment of technologies in cardiovascular health.

Methodologies used by our researchers range from molecular cellular biology, integrative physiology, and clinical and epidemiological studies. Research in this Axis continues to benefit from the large annual patient volume and medical procedures conducted in the Division of Cardiology and Critical Care at the MUHC, which include 40,000 out-patients, over 3,600 cardiac catheterization procedures and 1,200 open heart surgeries, providing a wealth of clinical material vital to the success of these studies.

The Clinical Unit, which already includes cardiac catheterization laboratories and a Coronary Care Unit, now has a new Non-Invasive Laboratory with two state-of-the-art echocardiology machines dedicated to the study of vascular function. This cutting-edge technology will allow the study of large populations of specific metabolic or genetic disorders in a non-invasive fashion.

Major basic research themes are genetics of coronary artery disease and cardiovascular risk factors, genetics of HDL and HDL Biogenesis, cellular biology of cholesterol transport and vascular biology. The clinical themes are varied and focused on the highly specialized areas of care provided to patients with cardiovascular diseases.



Collaborators

Maude Pagé, Michel Doucet,
Mark J. Eisenberg

Funding by

Canadian Institutes of Health Research

Leading One of the Largest Québec Epidemiological Studies

Invasive procedures ensure better survival in elderly after heart attack

In the past, corrective invasive procedures after a heart attack (acute myocardial infarction) were not commonly offered to patients over 80 as they were judged to be too risky. However, this practice is changing. The trend today for these invasive procedures, such as revascularization, is now more common in patients of this age group as they contribute to an increased survival rate that greatly outweighs the perceived risk.

This is the conclusion of Dr. Louise Pilote, Researcher in Epidemiology at the Research Institute of the MUHC, in her study led in collaboration with colleagues at the Université de Montréal and the Jewish General Hospital.

The 10-year study, which involved nearly 30,000 patients from Québec, shows an increase of more than 20 percent of angioplasty and a decline in mortality rate. Another interesting aspect of this research, is that it brings the relationship of our ageing population and health care management to the forefront.

Dr. Pilote says that they now believe that the increase in revascularization procedures such as angioplasty and bypass surgery in patients aged 80 and over, is responsible for the decrease in mortality rate. “Our results lead us to predict that in the near future more and more of these types of invasive procedures will be used. The challenge lies in making available human and financial resources within the health system to support this new approach.”



Dr. Louise Pilote



Endocrinology, Diabetes, Nutrition and Kidney Diseases

Leaders

48 members

Stéphane Laporte, PhD
Simon Siper Wing, MD

The Endocrinology, Diabetes, Nutrition and Kidney Diseases Axis has a diverse team of clinical investigators, who in collaboration with fundamental and epidemiological researchers, comprise the largest division of Endocrinology and Metabolism in Canada and is one of the most comprehensive in North America. Researchers in this Axis study a broad range of disorders, including kidney disease, hormone related cancers and diabetes, which has become a worldwide epidemic, and affects over 2 million Canadians.

The Axis has extensive expertise in biochemistry and cell biology of hormone receptors and related signaling pathways, as well as in genetic analyses of how DNA sequence variation modulates disease risk. Axis researchers use a broad array of conceptual and methodological tools, and utilize technologies from high-throughput genotyping, proteomics, and mass spectrometry, to transgenic and knockout animal models.

The large clinical patient volume at the MUHC represents a rich resource for clinical epidemiological research in endocrine diseases. Researchers in this Axis have identified the molecular mechanisms important in diabetes, kidney and neurodegenerative diseases, which in turn have led to potential therapeutic strategies applied by our investigators in large-scale clinical studies. This is part of our bench to bedside philosophy that allows patients to rapidly benefit from the latest research advances.

Obesity, diabetes and its complications remain major global public health problems. To address this, our Axis has three major themes or research, which are aimed at understanding the underlying basis of the many metabolic abnormalities of diabetes and identifying new treatments, the cellular mechanisms by which hormones exert their effects, and the mechanisms underlying kidney development and disease. Through the recruitment of additional researchers over the past four years, we are now even better positioned to meet the challenges ahead.



Collaborators

Dr. Sylvain Chemtob, Dr. Audrey Claing,
Dr. Terence Hébert, Dr. William Lubell

Funding by

Canadian Institutes of Health Research (CIHR) Team
Grant in GPCR Allosteric Regulation

New Drug Compound with Potential to Reduce Risk of Preterm Births

Compound PDC113.824

Known as PDC113.824, this compound is the precursor of a drug which may one day provide effective treatment for the common and very serious problem of preterm birth. These are the findings from a study resulting from a collaborative effort by researchers from the Research Institute of the MUHC, McGill University, Université de Montréal and Centre Hospitalier Universitaire Sainte-Justine Research Centre.

“We are excited about this compound because it belongs to a new class of drug, and because it has potential to prevent premature labour, possibly with fewer side effects than current treatments,” says MUHC endocrinology researcher, Dr. Stéphane Laporte, corresponding author of a recently published study of PDC113.824.

At the moment little is known about how preterm birth can be prevented and although clinical interventions have focused on inhibiting uterine contraction there are no consensus treatments for premature labour. The drugs which are available at present can cause side effects in both mother and unborn baby. Development of this compound is especially significant because it has a different, more targeted mode of action than conventional pharmaceuticals, and therefore may cause fewer side effects.

Compound PDC113.824 is one of an emerging class of pharmaceuticals known as biased allosteric drugs. This class of drugs interacts with receptors on the cell’s surface in a different way than conventional drugs, and produces different effects. The compound studied by Dr. Laporte and his colleagues not only acts on different cell receptors than those usually targeted in the uterus, but can modify the cell’s usual response to stimulation by natural substances – a property known as “bias.” Neither allosteric drugs nor biased drugs are completely new, but there are very few examples of compounds that have both these properties.



Dr. Stéphane Laporte



Health Outcomes

Leaders

Michal Abrahamowicz, PhD

Nancy Mayo, PhD

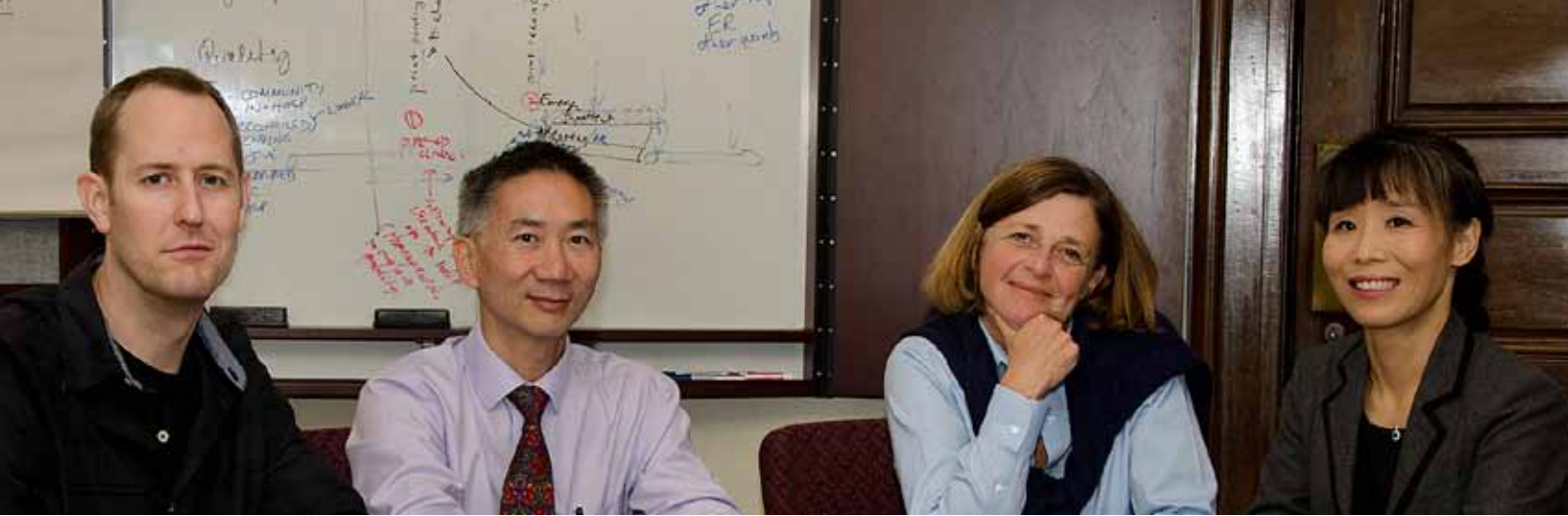
119 members

The overall aim of the Health Outcomes Axis is to optimize outcomes through the evaluation of health interventions, systems and policies. Members of this Axis conduct epidemiological, biostatistical and evaluative research on the distribution and determinants of health states in the general population and clinical populations. The overall aim of the Health Outcomes Axis is to optimize outcomes through the evaluation of health interventions, systems and policies.

Members of this Axis conduct epidemiological, biostatistical and evaluative research on the distribution and determinants of health states in the general population and clinical populations. By using administrative data, Axis members can initiate large scale investigations on a range of subjects, such as the effectiveness of drug therapies, existing and emerging technologies, health policies, clinical informatics and trends in acute and chronic health conditions. Health Outcomes Axis investigators are at the forefront of research into patient-reported outcomes (PROs) – a topic that has stimulated this field in recent years – and are recognized experts in the methodological and biostatistical methods used to advance understanding of the effects of health conditions on individuals, their families and society.

Researchers in this Axis have conducted a great deal of research on clinical informatics, which provide researchers with access to a rich volume of clinical data from the implementation of a new electronic health record system at the MUHC. The capacity to use linked clinical and administrative data to track emerging epidemics is crucial in the wake of E. coli and C. difficile outbreaks and makes investigators at the Research Institute among the most competitive research groups in the world.

The Axis members are also heavily involved with Nursing and with the School of Physical and Occupational Therapy, providing a truly interdisciplinary axis. The Health Outcomes Axis brings together a diversity of health backgrounds including medicine, dentistry, surgery, anesthesiology, psychology, nursing and rehabilitation.



Dr. David Buckeridge, Dr. Allen Huang, Dr. Robyn Tamblyn, Dr. Yeona Jang

Priority **Electronic health record**

An electronic health record system should be the backbone of healthcare reform in Canada and more must be done to speed up the implementation of this initiative across the country. Furthermore, for this system to be put in place effectively, doctors and front line healthcare workers and administrators must be encouraged to play a more active role. These are the findings of an innovative new study entitled “A qualitative study of Canada’s experience with the implementation of electronic health information technology,” assessing the effectiveness Canada Health Infoway’s e-health plan. The study, which was conducted by scientists at the Research Institute of the McGill University Health Centre(MUHC) and McGill University.

The researchers interviewed key stakeholders from national and provincial organizations in Alberta, British Columbia and Ontario, who are responsible for policy and leadership in health information technology. The objective was to look at both the successes and lessons learned in order to define needs and facilitate the adoption of e-health records in Canada. The results showed that Canada Health Infoway has met with some success in setting up standards and developing a plan for provinces to share resources, but that more work needs to be done to improve and speed up the implementation of health information technologies to support challenges in delivering the best care for all Canadians.

The Canada Health Infoway project was implemented by the federal government in 2001 with the goal of accelerating e-health implementation and creating a national system of interoperable electronic health records. After 10 years and \$1.6 billion of investment in 280 health information technology projects, Canada still lags behind countries such as Denmark, the United Kingdom, and New Zealand.

“For all levels of care, but particularly primary care, which is where most care is provided in western countries, Canada and US have the lowest adoption of e-health records. We need an e-health policy that aligns the spending in health information technology with our priorities in the healthcare system,” says Dr. Robyn Tamblyn, lead author of the study and a medical scientist at the Research Institute of the MUHC.

Collaborators

Ronen Rozenblum PhD, Yeona Jang PhD,
Eyal Zimlichman MD, Claudia Salzberg MS,
Melissa Tamblyn MPA, David Buckeridge MD PhD,
Alan Forster MD MPH, David W. Bates MD MPH

Funding by

The Commonwealth Fund and the Canadian Institutes
of Health Research



Human Reproduction and Development

Leaders

39 members

Hugh Clarke, PhD
Paul Goodyer, MD

Research in the Human Reproduction and Development Axis is focused on the genetic and physiological basis of reproduction and infertility, and on the biology of development. Axis researchers focus on some of the major issues that affect society today, such as declining fertility rates, developmental disorders that arise during pregnancy, and the connection between environmental toxicants and reproductive failure.

A major focus of the clinical research of the Axis is improving assisted reproduction. The Reproductive Centre has developed several novel methodologies in assisted reproductive technologies, including a new technique of oocyte cryopreservation, termed vitrification, which enables women to preserve oocytes for future fertilization. Importantly, oocyte vitrification can also provide hope for patients with malignant diseases such as cancer, who need chemotherapy and therefore become infertile.

Researchers in the Human Reproduction and Development Axis are leaders in the field of spermatogenic stem cells. In the male, understanding reproduction with projects encompassing the determinants of the factors regulating germ cells develop from the spermatogonial stem cell to sperm. Specifically, The RI-MUHC investigators examine how environmental and therapeutic agents induce germ cell damage leading to infertility, cancer and/or defective spermatozoa that can transmit alterations to their progeny.

A key future objective is to bring our members, who currently work at three different locations, together at the new Research Institute at the Glen Campus. The resulting intellectual exchange will facilitate new research collaborations as well as provide an enriched training environment for our students and clinical and postdoctoral fellows.

Close physical proximity will of course also enable more efficient use of resources, including transgenic animals, tissue culture facilities and tools and equipment for cellular imaging. It will also stimulate new collaborations regarding stem cells in medicine. Embryonic stem cell biology has obvious direct implications for the field of human reproduction but now of great interest is the use of stem cells to treat organ damage later in life. We envision this as a major area to expand in the years to come.

Collaborators

Led by Dr. Tawfeg Ben-Omran, field research was carried out by the Qatar Medical Genetic Center. The sequencing was carried out in close collaboration with the staff of the Genome Quebec sequencing facility. The collaboration was coordinated by Dr. David Rosenblatt from the Department of Human Genetics

Funding by

Canada Institutes for Health Research, the Research Institute of the McGill University Health Centre, and a Canada Research Chair Award to Dr. Majewski

The Power of New Exome and Genome Sequencing Approaches

As part of McGill's "RaDiCAL" project (Rare Disease Consortium for Autosomal Loci), collaborators in Qatar conducted field research with three patients from biologically interrelated Bedouin families, and sent samples to Canada for analysis by GA JOE – a high-tech genome analyzing machine. The research effort was led by husband and wife team Dr. Jacek Majewski and Dr. Loydie A. Jerome-Majewska, both of McGill University's Department of Human Genetics and the Research Institute of the McGill University Health Centre. The Team discovered that mutations in the gene SCARF2 are responsible for the Van Den Ende-Gupta syndrome, and published their findings in the American Journal of Human Genetics.

"Essentially, with a new technique known as exome capture and sequencing, we can now quickly sequence all of the coding portions of the human genome. This approach allows us to identify mutations responsible for rare genetic disorders. While they were too rare to attract much interest, these disorders hold in fact a lot of promise for the identification of the genes and pathways that are involved in generating human diversity. Moreover, knowing the mutations will be essential for future genetic testing and potential therapeutic intervention."

In anticipation of the fast advances in technology, we now work at identifying as many of the genes responsible for rare disorders as possible. "This is one of the earliest successes of this project, which is still a hybrid of old and new technologies. In this particular case, although we found the mutation the old fashioned way, we had immediate confirmation using exome sequencing," Majewski said. There is no doubt that the 'RaDiCAL' approach to gene discovery opens doors to better understanding of human diversity and health.



Dr. Loydie A. Jerome-Majewska and Dr. Jacek Majewski

Infection and Immunity

Leaders

59 members

Marcel Behr, MD, MSc
Ciriaco Piccirillo, PhD

The Infection and Immunity Axis is a large, multidisciplinary group that encompasses the rapidly expanding fields of immunology, host defense, autoimmunity and atopic disorders, such as asthma and eczema. These programs are representative of the complexity of our research effort spanning a broad range of microbial targets and human hosts as well as geographical areas.

Many factors make the research conducted by this Axis ever more relevant in today's world; changes in Canadian and Québec immigration policies, increases in international movement of livestock and consumables, significant expansion of overseas travel, commerce and studies, and global warming, have contributed to increased risk from infectious diseases which kill millions of people every year.

Axis investigators continue to focus on major emerging pathogens and international concerns, including malaria, salmonella, measles, tuberculosis, leishmania, mycobacteria and leprosy. Elucidation of the microbiological underpinnings of idiopathic and so-called immune conditions, are an increasing feature of this work. Advanced studies of the host response to HIV, and studies of HIV co-pathogens, logically fall into this Axis. Axis researchers use advanced genomic, microarray and proteomic tools in both animal models and human disease to discover determinants of pathogenicity and host response.

The Infection and Immunity Axis is unique in that it drives a large number of investigator-initiated grants to industry as well as being active in a large number of multi-centre trials. These trials are aimed at defining optimal utilization of novel therapeutic molecules to combat inflammatory conditions or resistant infections. Novel innovations that the Axis is driving include characterization of the genome in mycobacterial strains and their relationship to disease presentation and diagnosis, immune modulation to optimize bone marrow and solid organ transplantation, and strategic use of immune prophylactic therapies in oncology patients. The Axis has also continued to build and expand in its traditional areas of strength, such as HIV-AIDS.

Collaborators

Dr. Elias Matouk, Dr. Juan DeSanctis,
Dr. Marian Hajduch

Funding by

Ministère du Développement économique,
de l'Innovation et de l'Exportation
et MSBi Valorisation

Cystic Fibrosis

Orphan drug offering hope

In addition to their suffering, rare disease patients often have to face the harsh reality that few pharmaceutical companies will ever be able to offer new treatments for their condition because the costs of new treatments will never be recovered from such a small market. But there are ways they can be helped. The U.S. Food and Drug Administration's "Orphan Drug Designation" offers a wide range of benefits that help organizations developing treatments for diseases and conditions affecting fewer than 200,000 patients in the United States. It was recently granted to McGill University for research conducted at the MUHC into the use of the drug fenretinide for the treatment of pulmonary infections caused by *Pseudomonas aeruginosa* in patients with Cystic Fibrosis (CF).

CF is a chronic, hereditary disease affecting the respiratory and digestive systems of approximately 70,000 people worldwide. *Pseudomonas aeruginosa* infects more than 80 per cent of CF patients and contributes to the decline in pulmonary function - the ability of the body to pump blood between the heart and the lungs. The infection is a major cause of sickness and death and is difficult to treat since it is resistant to many drugs.

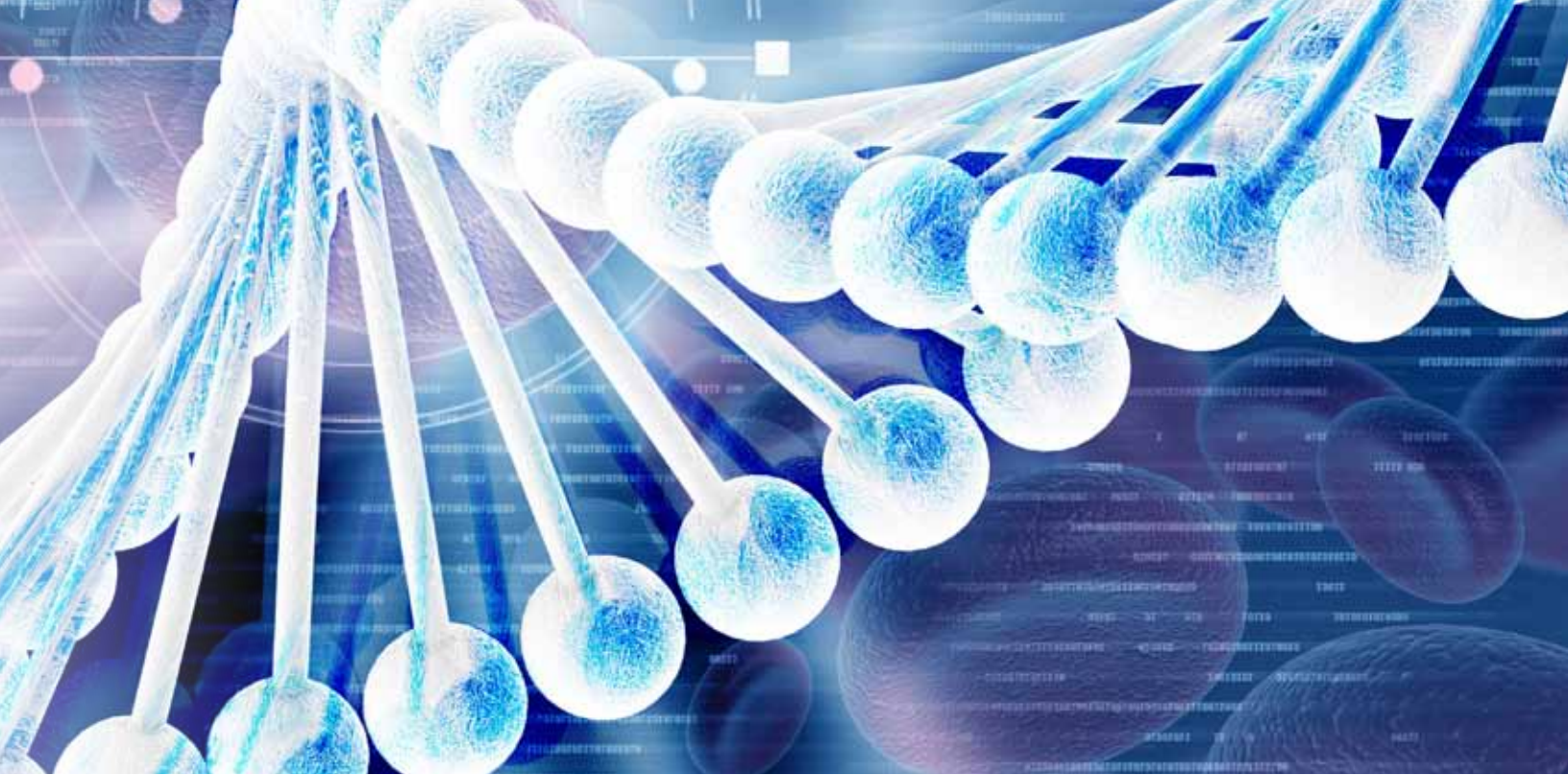
"We strongly believe that fenretinide has the potential to improve morbidity and prognosis in CF patients at different levels," mentioned Dr. Danuta Radzioch, a professor of Experimental Medicine at the MUHC and McGill's Faculty of Medicine. "Our research has demonstrated that fenretinide reduced lung inflammation as well as the frequency and the severity of pulmonary infections." Fenretinide is a drug that was originally investigated for potential use in the treatment of cancer but has not been commercially available.

Orphan Drug Designation provides opportunities for grant funding toward clinical-trial costs, tax advantages, FDA user-fee benefits, and seven years of market exclusivity in the U.S. following drug approval by the FDA. This designation is a critical, value-added step towards the development of fenretidine treatment for the benefit of CF patients.

The next step will be a clinical trial to assess safety, tolerability and efficacy of fenretinide in CF patients, to be undertaken in collaboration with the Montreal Chest Institute.



Dr. Danuta Radzioch



Medical Genetics and Genomics

Leaders

19 members

Nada Jabado, MD, PhD

Eric Alan Shoubridge, PhD

Medical genetics relates to almost every human condition, from cancer to tuberculosis and brain tumours, as well as drug resistance and vaccine development. Research in this Axis is focused around three central themes: identification of genes associated with disease, mechanisms of genetic disease and applied genetics.

Gene and mutation discovery continue to be major themes for both simple Mendelian traits and for complex genetic and infectious diseases. Mouse models of complex genetic traits and multifactorial diseases, epigenetic germline modification, and host resistance to infection, have been developed and continue to play an important role in the understanding of human genetic disease. Statistical genetics studies, which involve the mapping and identification of genetic variation contributing to disease, are a crucial underpinning of the analysis of complex genetic diseases.

The introduction of new technologies to identify mutations or cytogenetic abnormalities, and the development of testing procedures for recently characterized disorders are continuing objectives of the Axis. Large-scale genomics projects such as Genetic Regulation of Disease (GRID) and genome sequencing of important pathogens such as *C. difficile* were initiated by Axis researchers at McGill University and Genome Quebec Innovation Centre. The capability of the Genome Centre to generate large datasets on allelic variants in populations raises ethical issues that must be dealt with if society is to benefit from the influx of new knowledge, which is why ethical, legal and social issues also continue to be essential components of the Axis program.

The Axis will continue to emphasize the three themes that are relevant to its mission. Next generation sequencing technologies have quickened the pace of disease gene discovery, and it is likely that the genetic basis of most Mendelian disorders will be known within the next two years. The focus of genetics in the post-genomic era is already shifting toward a more detailed understanding of gene-gene-environment interactions in complex, common diseases with a genetic influence, and in the role of susceptibility genes, particularly in genome-wide association studies.

Funding by

The study published in The New England Journal of Medicine was made possible by grants from the Turner Family Cancer Research Fund, le Fonds de la recherche en santé du Québec (FRSQ); the Research Institute of the McGill University Health Centre (The RI-MUHC) and the Henry R. Shibata Fellowship of the Cedars Cancer Institute; the Breakthrough Breast Cancer Research Centre; and the Research Councils UK.

The study published in the Journal of the American Medical Association was made possible by grants from the Weekend to End Women's Cancers, Turner Family Cancer Research Fund, le FRSQ; The RI-MUHC and the Henry R. Shibata Fellowship of the Cedars Cancer Institute

Collaborators

Dr. Marc Tischkowitz

Solving Medical Mysteries with Genetics

The mystery began in 1976. Adolfo Pampena was diagnosed with a rare form of cancer that caused a strange combination of symptoms and was associated with the occurrence of multiple tumours in his stomach and colon. His medical team was stumped and was unable to answer the most important questions for him and his family: the cause of his disease and the risk for future generations.

Now, 35 years later, the answers are at hand thanks to a genetic study led by investigators at the Research Institute, the McGill Program in Cancer Genetics at the Gerald Bronfman Centre for Clinical Research in Oncology and the Lady Davis Institute for Medical Research at the Jewish General Hospital. The study was published in The New England Journal of Medicine.

The researchers were able to pinpoint the gene responsible for the disease (BUB1B), which is involved in the regulation of chromosomal separation. Instability during cell division can result in chromosomes ending up in the wrong place, which can lead to the development of tumours. "The general significance of this discovery is that individuals can be seen at our genetic clinic with an unknown condition and end up with a diagnosis that is relevant to patients and their families," said Dr. William Foulkes, senior author of the study.

In another study published in the Journal of the American Medical Association, Dr. Foulkes details a second solved mystery involving five families with a long history of nontoxic multinodular goiter (MNG). The most common form of the disease is not genetic and is due to iodine insufficiency. However, this form of MNG was known to be genetic, but to date, no one had ever localized the specific gene or mutation responsible. Dr. Foulkes, Dr. Marc Tischkowitz (from the Program in Cancer Genetics and the Lady Davis Institute) and their team finally succeeded, and found the mutation in a surprising place.

As it turns out, the mutation, in a gene called DICER1, was extremely unusual. It changes the protein in only one place, and that single change is enough to trigger multinodular goiter. Generally speaking, when you have a mutation in a disease gene, it causes a multitude of problems, not just one illness. But in this case, we have no evidence that it causes anything except goiter. Intriguingly, women in three of the families had been diagnosed with an unusual type of ovarian tumor called Sertoli-Leydig Cell Tumor and thus Foulkes and his colleagues were able confirm that there is a genetic link between multi-nodular goiter and these rare tumors. This link had first been postulated in 1974.

"In the future, our challenge as researchers is to be able to help people with an unknown condition by finding out rather quickly what the genetic cause of their problem is" explained Foulkes. "We can hope in the long term to have an impact on treatment, diagnosis and other aspect of management."



Dr. William Foulkes



Mental Illness and Addiction

Leaders

Kathryn Gill, PhD
Chawki Benkalfat, MD

29 members

Unravelling pathophysiology to design novel therapeutics is a priority for modern psychiatric research and a key goal of this research Axis. The emphasis of this group is to investigate the behavioural and brain correlates of neurotransmitter dysfunction, using functional neuroimaging techniques, genetic dissection and pharmacological manipulations, while ensuring continuous dialogue between basic and clinical research and rapid knowledge transfer from the bedside, to the bench and back.

The addiction program combines the strengths of a well-established hospital-based treatment unit and an emerging translational neuroscience program. The research program covers many important concerns ranging from behavioural neuroscience and neurophysiology, to pharmacology, the genetic risk for developing addiction, and hospital and community-based treatment programs in addiction. Mood disorders studies involve the research of novel antidepressant treatments, such as compounds that act on the cannabinoid systems, and high frequency deep brain or vagus nerve stimulation in treatment-refractory depressed patients.

Autism research within the Axis is world renowned, and involves identification of environmental risk factors, secular trends in incidence, and efficacy of psychosocial and psychopharmacological interventions. The autism research program is supported by a strong clinical program recognized as a major tertiary and quaternary center for the province of Québec. Research on Attention-Deficit Hyperactivity Disorder (ADHD) involves evaluating the efficacy of novel interventions combining psychopharmacology and psychotherapeutic techniques across age ranges. Pharmacogenetic studies are also being pursued to understand better mechanisms which underlie response to drug treatment in this disorder.

Collaborators

Dr. Pierre Bleau, Dr. Alain Lesage and Dr. Stéphane Guay
(Louis-H. Lafontaine Hospital)

Funding by

Ministry of Justice

Post-Traumatic Disorders

Research on the psychosocial impact of the Dawson College shooting

A research team from the McGill University Health Centre and Fernand-Seguin Research Centre of Louis-H. Lafontaine Hospital presented the results of its three-year study, a world first, into the 2006 Dawson College shooting to the Government of Québec's Ministry of Public Security. The incidence of psychosocial trauma caused by a school shooting far outnumbers physical cases. Close to 1,000 students and employees attending or working at the College at the time of the tragedy were involved in this groundbreaking study.

"Despite over 60 school shootings since the 1999 tragedy at Columbine High School in Colorado, there have been few empirical studies on the psychological effects of these incidents and no study until now that evaluated the effectiveness of psychological intervention. It is crucial that we use what we've learnt from these experiences to improve the care available to those in need in the event that this should ever happen again." says Dr. Warren Steiner

Four detailed reports outline the psychological impact of the Dawson College shooting, review the medical response, make recommendations to educational institutions, hospitals, social services and the government, and propose a multimodal intervention program to be implemented through Québec's ministries and networks of justice, health, social services, education and public security, should a similar incident occur in the future. This program is called SECURE (Support, Evaluation and Coordination United for Recovery and Education).

A total of 30% of respondents experienced a psychological disorder, including post-traumatic stress disorder, major depression, alcohol dependence and social phobia — twice the percentage seen in a 2002 mental health survey of the Québec population.

The SECURE program recommends the creation of crisis management teams and the deployment of government-designated crisis-intervention experts to work with these teams. SECURE also recommends the creation of proactive activities for public education on mental illness, promotion of healthy workplaces, and early detection programs in educational institutions for both students and staff in the hope that more people will be encouraged to seek help in the future, as the study found that some Dawson respondents were reluctant to seek help due to the fear of being stigmatized by colleagues, friends and loved ones.

SECURE stresses the importance of integrating a psychosocial intervention program in hospital Code Orange (crisis response) plans following the model developed at the MUHC after the Dawson shooting.

In presenting the four reports to the Government of Québec, Dr. Pierre Bleau, who coordinated the research team and is the Medical Director of the Anxiety Disorders Program at the MUHC, underlined the importance of the participation and openness of the Dawson community, which allowed researchers to evaluate the psychological interventions and make recommendations to improve psychosocial responses in the future.



Dr. Warren Steiner

Musculoskeletal Disorders

Leaders

38 members

Richard Kremer, MD, PhD
Henri-André Ménard, MD

The overall goals of the Musculoskeletal Disorders Axis are to improve our understanding of disease mechanisms and expedite the development of strategies for the prevention, diagnosis and management of musculoskeletal disorders.

Clinical investigators in this Axis focus on the study of musculoskeletal disorders, particularly musculoskeletal repair and the biological and genetic basis of bone disorders and bone cancer. Current research projects include identification of molecular pathways of medical conditions affecting bones and joints, such as degenerative and inflammatory joint and disk diseases, primary and metastatic cancer, osteoporosis and axial/peripheral insufficiency fractures, and musculoskeletal development problems like osteogenesis imperfecta, congenital malformations and scoliosis.

Current ground-breaking research is being done on the development of minimally invasive spine surgery concepts, including robotic science and minimally open technology, as well as the investigation of agents that trigger new bone formation. Genetic studies in animal models include gene expression in bone precursors of osteoporosis, candidate genes for osteoporosis, and the interaction of hormones and cancer cells with the skeleton in order to discover new ways of preventing or reversing major bone diseases. The Axis is also a site of the Canadian Multicentre Osteoporosis Study (CAMOS), which, along with other epidemiological projects, continue to gather critical information in Québec on the impact of specific drugs on the skeleton.

The clinical investigators of this Axis are providing opportunities to test the most recent therapeutic approaches in a variety of clinical disorders such as osteoporosis, skeletal complications of cancer, osteogenesis imperfecta and other rare genetic bone diseases. A unique cohort of patients with rare genetic disorders diagnosed and followed at the Shriners Hospital have now reached adulthood and are treated and studied at the Bone Metabolism Centre of the MUHC. All these unique patients' cohorts are entered in a database and blood, DNA and tissues are collected for future clinical studies. The MUHC prides itself as one of the major hubs of musculoskeletal research in North America and in the world thanks to the active collaboration between clinical and basic researchers studying skeletal disorders throughout the lifespan.





Collaborators

Drs Kaberi Dasgupta, Sasha Bernatsky, Youssef Habel, Greg Berry, Mark Burman and Susan R. Kahn (JGH)

Funding by

Canadian Institutes of Health Research (CIHR)

Short-Term Mortality Associated with Failure to Receive Home Care after Hemiarthroplasty

Every year in Canada approximately 1,000 seniors fall at home and then undergo emergency partial hip replacement surgery (hemiarthroplasty). The risk of death among these patients is high in the first few months immediately following surgery.

A new study suggests that survival increases when patients receive home care after their surgery. The results of the study, led by MUHC researchers, are published in the latest issue of the Canadian Medical Association Journal.

“In this study, we found that seniors who do not receive home care after discharge for partial hip surgery are 43 % more likely to die in the first three months following surgery,” says Dr. Elham Rahme, lead investigator of the study. “Our results also showed that less than 16 % of patients discharged home after a partial hip replacement surgery received home care.”

The study revealed that home care after hemiarthroplasty may be suboptimal in the province of Québec. Most patients discharged home did not receive home care in the first three months after discharge, potentially resulting in preventable deaths. The study, which looked at over 11,000 Québec hemiarthroplasty patients aged 65 and over, has significant public health implications, which researchers recommend should be considered by policy makers.

The article “Short-term mortality associated with failure to receive home care after hemiarthroplasty,” was published in the Canadian Medical Association Journal.



Dr. Elham Rahme



Neurosciences

Leaders

113 members

Salvatore Carbonetto, PhD
Robert James Dunn, PhD

The major goals of this Axis are to promote the development of therapeutic approaches to neurological disease through a program of basic and clinical research. Translational research programs, including clinical trials, are being conducted on a range of neurological disorders including multiple sclerosis, Parkinson's disease, amyotrophic lateral sclerosis, cerebrovascular disease, epilepsy, migraines, brain aneurysms and brain tumours.

The Axis is also enhancing its efforts, and visualization of behavioural and disease related changes in the brain, using the extremely high resolution of confocal microscopy in mice and rats. This cutting-edge technology allows researchers to document changes at individual synapses in animals subjected to learning paradigms or with neurodegenerative disorders.

An important new initiative for the Axis has been the initiation of programs in Neuro-Engineering as well as a Regenerative Medicine/Nanotechnology. A team of physicists, chemists, material scientists and neuroscientists are developing innovative artificial substrates for neuronal growth and synapse formation with the goal of restoring function to the damaged nervous system.

For more than 50 years, McGill University has been a world leader in the science of brain function and the treatment of neuronal disorders. This lead role continues today. Members of this Axis are carrying out a range of research within several thematic groups overseen by an administrative structure that speeds scientific progress through enhanced collaborative interactions. These groups include: fundamental biology of excitable tissue, neural trauma and regeneration, cognitive neuroscience, brain imaging, epilepsy, neuroimmunology and multiple sclerosis, neuromuscular research, brain tumour research, neurogenetics, visual neuroscience, cerebrovascular disease, complex neural systems, movement disorders and Parkinson's disease.



Collaborators

Drs Tongtong Wang, Stan Shapiro, Thao Huynh, Ann Gamsa, Gary J. Bennett (McGill), Jean-Paul Collet (UBC) and Ann Robinson, Thierry Ducruet

Funding by

Canadian Institutes of Health Research (CIHR)

Chronic Pain

Benefits of medical cannabis

The medicinal use of cannabis has been debated by clinicians, researchers, legislators and the public at large for many years as an alternative to standard pharmaceutical treatments for pain, which may not always be effective and may have unwanted side effects.

A new study by McGill University Health Centre (MUHC) and McGill University researchers provides evidence that cannabis may offer relief to patients suffering from chronic neuropathic pain. The results of the groundbreaking study are published in the Canadian Medical Association Journal.

In this study, low doses (25mg) of inhaled cannabis containing approximately 10% THC (the active ingredient in cannabis), smoked as a single inhalation using a pipe three times daily over a period of five days, offered modest pain reduction in patients suffering from chronic neuropathic pain within the first few days. The results also suggest that cannabis improved moods and helped patients sleep better. The effects were less pronounced in cannabis strains containing less than 10% THC.

“This is the first trial to be conducted where patients have been allowed to smoke cannabis at home and to monitor their responses on a daily basis. The patients we followed suffered from pain caused by injuries to the nervous system from post-traumatic (e.g. traffic accidents) or post-surgical (e.g. cut nerves) events, and which were not controlled using standard therapies. This kind of pain occurs more frequently than many people recognize, and there are few effective treatments available. For these patients, medical cannabis is sometimes seen as their last hope. This study marks an important step forward because it demonstrates the analgesic effects of cannabis at a low dose over a short period of time for patients suffering from chronic neuropathic pain,” says Dr. Mark Ware, lead author of the study.



Dr. Mark Ware

The study used herbal cannabis from Prairie Plant Systems (under contract to Health Canada to provide cannabis for research and medical purposes), and a 0% THC ‘placebo’ cannabis from the USA.

However, larger-scale studies with a longer time frame and higher doses of THC are needed to further evaluate the efficacy and long-term safety of medical cannabis. The challenge, for the researchers, is to continue to conduct rigorous clinical studies on the medical use of cannabis with strict attention to details such as quality and dosage. This will allow the debate to move forward by providing reliable scientific clinical data.



Leaders

41 members

James Martin, MD

Jean Bourbeau, MD

Respiratory Health

Researchers in the Respiratory Health Axis work collaboratively to characterize the inflammatory nature of a wide range of respiratory diseases, including asthma, tuberculosis, Chronic Obstructive Pulmonary Disease (COPD), cystic fibrosis, obstructive sleep apnea (OSA) and the role of infection in chronic inflammatory respiratory diseases.

Asthma is perhaps the largest area of research within this Axis, reflecting the increased prevalence of this disease, which now affects one in four children worldwide. The natural history of asthma is being addressed through an integrated program focusing on wheezing in children and its relationship to asthma in adulthood, development of allergy and antigen processing within the respiratory mucosa, and different mechanisms by which specific infections can affect exacerbation and impact treatment of the disease. Our researchers are also exploring new mechanisms that underlie persistent asthma in adults. New targets for therapy are being assessed in both animal models and human tissues, and the role of cytokines, leukotrienes and growth factors will soon become important areas of research for this group.

The Axis is organized into two strong components, a fundamental and translational pathobiology theme, and a clinical and evaluative theme. The fundamental research program of the Axis is currently comprised of several sub-themes of research: obstructive airway diseases, sleep disordered breathing, respiratory muscle dysfunction and respiratory infectious diseases. The clinical and evaluative respiratory health research theme has sub-themes addressing several of the major pathologies that are the interests of the fundamental and translational pathobiology theme such as the obstructive airway diseases, sleep disordered breathing and tuberculosis.

The principal goal of the fundamental and translational theme is to identify the pathways of disease based on host responses to environmental triggers through the use of cellular and animal models of disease and the translation of key findings to human tissues and abnormal integrative physiology. The clinique and evaluative research theme is supported by a strong research unit, the Respiratory Epidemiology and Clinical Research Unit (RECRU). The Axis has a range of expertise from basic biochemistry, biophysics, integrated cardiorespiratory physiology, intervention evaluative research and modeling, to the examination of population health.

Collaborators

Dr. Wan Tan, The James Hogg iCAPTURE Centre for Cardiovascular and Pulmonary Research, University of British Columbia

Funding by

Collaborative research program CIHR / Rx & D, in partnership with AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Pfizer, the Respiratory Health Network of the FRSQ and Novartis



Launch of CanCOLD

Understanding chronic obstructive pulmonary disease

The leading cause of hospitalization and the third leading cause of death in Canada, namely chronic obstructive pulmonary disease (COPD), is one of the least understood diseases. McGill University Health Centre and McGill University investigators have launched an ambitious and innovative pan-Canadian study entitled CanCOLD (Canadian Cohort of Obstructive Lung Disease). Involving researchers at nine sites across the country and a cohort of over 2,000 patients, CanCOLD is a prospective multi-centre cohort study conducted across Canada, dedicated to increasing our understanding of Chronic Obstructive Pulmonary Disease (COPD) and related co-morbidities, to improve its management and to reduce its burden. This first population based long-term COPD cohort study in Canada is set to end in 2023.

COPD is a chronic, degenerative disease of the respiratory system that affects nearly 3 million Canadians and includes two major disorders commonly known as chronic bronchitis and emphysema, which lead to severe respiratory failure. As many as 70 per cent of COPD patients are under-diagnosed due to a lack of knowledge of the disease among the general public and physicians.

“Smoking is a major risk factor of COPD, and as a result there is a certain public indifference towards the disease because there is a sense that it is self-inflicted. As researchers, part of our challenge is to change this perception; genetics, history of pulmonary infections during childhood, secondhand smoke and environmental factors are also major contributors. That a public-private consortium involving the Canadian Institutes of Health Research (CIHR) and several large pharmaceutical companies is supporting this study and facilitating the transfer of knowledge, from results to actual patient treatments, underscores the importance of this research. It is urgent that we use the tools of modern medicine to change the course of this devastating disease, which still has far too much stigma attached to it. If this trend continues, it is feared that more than 6,000 women and 5,000 men nationwide will die from COPD complications in 2010. Our goal is to develop more effective management tools to reduce the economic and social burden associated with this disease,” explains Dr. Jean Bourbeau, lead investigator of CanCOLD.

CanCOLD represents an exceptional means to multiply the savoir faire of researchers to accelerate the understanding of chronic diseases and improve patient care. Leading an initiative such as this one, which is based on a solid platform of research, information technology, modern infrastructure, and nationwide collaboration in biomedical sciences, is totally aligned with the strategic plan of the Research Institute of the MUHC.



Dr. Jean Bourbeau

List of Regular and Associate Researchers by Axis

Can cer

ABISH, Sharon
 AHLGREN, Paul Donald
 ALCINDOR, Thierry
 ALI, Suhad
 ANIDIAR, Maurice
 APRIKIAN, Armen G.
 BATEMAN, Andrew
 BRODT, Pnina
 CHEN, Junjian
 CHEVALIER, Simone
 CHEVRETTE, Mario
 COURNOYER, Denis
 CURY, Fabio
 DUCLOS, Marie
 EL NAQA, Issam
 EZER, Hélène
 FARIA, Sergio Luiz
 FERRI, Lorenzo
 FRANCO FERNANDES, Bruno
 FREEMAN, Carolyn Ruth
 GAROUFALIS, Evgenia
 GIGUÈRE, Vincent
 GOLDBERG, Mark S.
 HICKESON, Marc
 HIRSH, Vera
 JEAN-CLAUDE, Bertrand
 KASSOUF, Wassim
 KAVAN, Petr
 LANEUVILLE, Pierre
 LAPOINTE, Jacques
 LEBRUN, Jean-Jacques
 LEE, Virginia
 LEHNERT, Shirley Margaret
 LISBONA, Robert
 LYNCH, Ann
 MEGUARDITCHIAN, Ari-Nareg
 METERISSIAN, Sarkis
 METRAKOS, Peter
 MIHALCIOIU, Catalin
 MITCHELL, David
 MUANZA, Thierry
 MULLER, William J.
 NEPVEU, Alain
 PARK, Morag
 PORTELANCE, Lorraine
 RAK, Janusz
 ROBERGE, David
 ROCHELEAU, Christian
 SALEH, Maya
 SEBAG, Michael
 SEUNTJENS, Jan
 SHENOUDA, George
 SHIBATA, Henry
 SHUSTIK, Chaim
 SIEGEL, Peter
 SOISSON, Emilie
 SOUHAMI, Luis
 STORRING, John
 TANGUAY, Simon
 THIRLWELL, Micheal P.
 TONIN, Patricia N.
 VALENTI, David
 VERHAEGEN, Frank
 VIGANO, Antonio
 WANG, Beatrice

WASCHKE, Kevin
 YANG, Xiang-Jiao

Cardiovascular Diseases and Critical Care

ALEYASSINE, Hassan
 BEAUDRY, Jean-Pierre
 BILODEAU, Luc
 BOTTEGA, Natalie Ann
 BRACCO, David
 BROPHY, James
 BUI THIEU, Jean
 BÉLAND, Marie Joséé
 CECERE, Renzo
 CHALUT, Dominic
 CORRIVEAU, Marc Michel
 CÔTÉ, Robert
 DANCEA, Adrian
 DASKALOPOULOU, Styliani Stella
 DE VARENNES, Benoit
 ENGERT, Jamie
 ESSEBAG, Vidal
 FRIGON, Chantal
 GARG, Sunil
 GENEST, Jacques
 GIANNETTI, Nadia
 GOLDBERG, Peter
 GOTTESMAN, Ronald
 GREEN, Laurence
 HADJIS, Tomy A.
 HAICHIN, Richard
 HUSSAIN, Sabah N.A.
 HUYNH, Thao
 KISS, Robert
 KRISTOF, Arnold
 LACHAPELLE, Kevin J
 LOWENSTEYN, Ilka
 MACKENZIE, Kent
 MAGDER, Sheldon
 MARCIL, Michel
 MARELLI, Ariane
 MARTUCCI, Giuseppe
 MULDER, David S.
 NGUYEN, Viviane
 OPATRY, Lucie
 PELLETIER, Jean-Philippe
 PELLETIER, Patricia
 PRABHAKAR, Manu
 PRIMAVESI, Robert
 QURESHI, Salman Tahir
 RABINOVITCH, Mark A.
 ROSENGARTEN, Michael
 SAMI, Magdi H.
 SHEMIE, Sam
 SHUM-TIM, Dominique
 SMILOVITCH, Mark
 SNIDERMAN, Allan D.
 SPURLL, Gwendoline M.
 STEINMETZ, Oren
 WARNER, Margaret
 WHITTEMORE, Blair
 WITHINGTON, Davinia

Endocrinology, Diabetes, Nutrition and Kidney Diseases

AHMED, Najma
 ALAM, Ahsan
 ANDONIAN, Sero
 BARRÉ, Paul
 BELL, Lorraine
 BENNETT, Hugh P.J.
 BERGERON, John J.M.
 CHEVALIER, Stéphanie
 CYBULSKY, Andrey
 DAHAN, Michael Haim
 GARDINER, Robert John
 GOUGEON, Réjeanne
 IQBAL, Sameena
 KOKOEVA, Maia V
 KRISHNAMOORTHY, Preetha
 LAPORTE, Stéphane
 LAROSE, Louise
 LATTERMANN, Ralph
 LEGAULT, Laurent
 LEMAY, Serge
 LIU, Jun-Li
 MAMER, Orval A.
 MARCOVITZ, Sorana
 MARLISS, Errol Basil
 MAYRAND, Serge
 MELTZER, Sara J.
 MORAIS, José Antonio
 MORINVILLE, Veronique
 MUCSI, Istvan
 NILSSON, Tommy
 PARASKEVAS, Steven
 POLYCHRONAKOS, Constantin
 POSNER, Barry Innis
 RIVERA, Juan Andres
 ROSENBERG, Lawrence
 SCHRICKER, Thomas
 Peter Stephan
 SHERMAN, Mark
 SRIKANT, Coimbatore B.
 TAKANO, Tomoko
 TANNENBAUM, Gloria S.
 TORBAN, Elena
 TURCOTTE, Bernard
 UNIKOWSKY, Bernard
 VASILEVSKY, Murray
 Lewis
 WHITE, John Howard
 WING, Simon
 YALE, Jean-François
 ZAPPITELLI, Michele

Health Outcomes

ABRAHAMOWICZ, Michal
 ADRIEN, Alix
 AFIF, Waqqas
 AHMED, Sara
 ALBUQUERQUE, Rubens
 ASENJO, Francisco
 ASSALIAN, Pierre
 BACHER, Yves
 BARKUN, Alan
 BARKUN, Jeffrey S.T.

BARTLETT, Susan Joan
 BARTLETT-ESQUILANT, Gillian
 BASTIEN, Robert
 BEAUDET, Nicole
 BERTRAND, Lise
 BHATT, Maala
 BILODEAU, Angèle
 BINIK, Irving
 BIRON, Alain
 BLASCHUK, Orest W.
 BRASSARD, Paul
 BUCKERIDGE, David
 CARLI, Francesco
 CARNEVALE, Franco
 CHRISTOU, Nicolas
 CLARKE, Ann
 CONSTANTIN, Evelyn
 COX, John-Joseph
 DA COSTA, Deborah
 DASGUPTA, Kaberi
 DAWES, Martin
 DENDUKURI, Nandini
 DESCHÊNES, Jean
 DOBKIN, Patricia
 DOUGHERTY, Geoffrey E.
 DUFFY, Ciarán
 DUROCHER, Jacques
 DÉRY, Véronique
 EL-SHERBINY, Mohamed
 FATA, Paola
 FEINE, Jocelyne
 FELDMAN, Liane
 FITZCHARLES, Mary-Ann
 FORGET, Sylviane
 FOSTER, Bethany
 FRAMARIN, Alicia
 FRIED, Gérald M.
 GAGNON, Anita J.
 GAGNON, Bruno
 GAGNON, Robert
 GAGNON, Serge
 GALIC, Ivan John
 GHALI, Maged
 GROVER, Steven A.
 GYORKOS, Theresa W.
 GÉNÉREUX, Martin
 HAMILTON, John Richard
 HANLEY, James A.
 HUANG, Allen R.
 HUTCHINSON, Thomas A.
 JOSEPH, Lawrence
 KHALIFÉ, Samir
 KHWAJA, Kosar
 KOSKI, Lisa
 KRAMER, Michael S.
 LACH, Lucyna
 LAIZNER, Andréa Maria
 LAMBERT, Gilles
 LAVOIE-TREMBLAY, Mélanie
 LESSARD, Marie-Lucie
 LESSARD, Richard
 LIBEN, Stephen
 MACDONALD, Mary Ellen
 MANDEL, Romain
 MANOUKIAN, John Jack

MASSON, Paule
 MAYO, Nancy E.
 MCGILLIVRAY, David
 MORISSETTE, Carole
 PARADIS, Gilles
 PARENT, Josée
 PATEL, Hema
 PERREAULT, Robert
 PILOTE, Louise
 PLATT, Robert William
 PLESS, Ivan Barry
 PORTER, Arthur
 QUACH-THANH, Caroline
 RAHME, Elham
 RAJAN, Raghu Dhruva
 RAZACK, Saleem Idris
 RENAUD, Lise
 RENNICK, Janet Elizabeth
 RILEY, Patricia
 RITCHIE, Judith
 ROBILLARD, Pierre
 RODRIGUEZ, Rosario
 (Charo)
 ROSSIGNOL, Michel
 ROY, Élise
 SAMPALIS, John
 SEWITCH, Maida
 SHIR, Yoram
 SOLYMOSS, Susan
 SOMERVILLE, Margaret
 Anne
 SOUNAN, Charles
 STOCK, Susan
 SULLIVAN, Michael
 SZEGO, Peter
 TAMBLYN, Robyn
 TANNENBAUM, Terry Nan
 THÉRIAULT, Gilles
 TOUSIGNANT, Pierre
 TOWERS, Anna
 VALIQUETTE, Louise
 VEILLEUX, Ginette
 WISEMAN, Jeffrey
 Gordon
 WOLFSON, Christina
 WONG, Philip
 WOOD DAUPHINEE,
 Sharon Lee

Human Reproduction and Development

BASSO, Olga
 BROWN, Richard
 CARRIER, Serge
 CHAN, Peter
 CHIAN, Ri-Cheng
 CIOFANI, Luisa
 CLARKE, Hugh J.
 CULTY, Martine
 DANIEL, Sam Joseph
 DUFORT, Daniel
 FAROOKHI, Riaz
 FAUCHER, Daniel J.
 GILBERT, Lucy
 GOODYER, Cynthia
 GOODYER, Paul
 GUPTA, Indra

JEDNAK, Roman
JEROME-MAJEWSKA, Loydie
JOHNSTON, Céleste C.
KRISHNAMURTHY, Srinivasan
LABERGE, Jean-Martin
MAJNEMER, Annette
MONNIER, Patricia
NAGANO, Makoto
NAUMOVA, Anna K.
O'FLAHERTY, Cristian
PAPADOPOULOS, Vassilios
REINHOLD, Caroline
ROBAIRE, Bernard
RYAN, Aimée
SEMENIC, Sonia
SHEVELL, Michael
SHRIM, Alon
SLIM, Rima
SNIDER, Laurie
TAKETO-HOSOTANI, Teruko
TAN, Seang Lin
TULANDI, Togas
ZINI, Armand

Infection and Immunity

ALIZADEHFAR, Reza
ALLARD, Robert
BEHR, Marcel
BEN-SHOSHAN, Moshe
BERNARD, Nicole F.
BITTON, Alain
BITZAN, Martin
BREWER, Timothy
CANTAROVICH, Marcelo
CAREY, Wayne D.
DE POKOMANDY, Alexandra
DESCHÉNES, Marc
DIVANGAHI, Maziar
FALLONE, Carlo
FALUTZ, Julian
FLETCHER, Susan
GILMORE, Norbert
GOLD, Phil
HALEY, Nancy
HORN, Ruth
KARATZIOS, Christos
KLEIN, Marina
LALONDE, Richard
LIBMAN, Michael
LOO, Vivian
MALO, Danielle
MANGES, Amee
MAZER, Bruce
MCCUSKER, Christine T.
MCDONALD, Jane
MOORE, Dorothy Louise
NASHI, Emil
NDAO, Momar
NEWKIRK, Marianna
NGUYEN, Dao
OLIVIER, Martin
PAI, Nitika
PICCIRILLO, Ciriaco
POTTER, Martin
PRIMEAU, Marie-Noël
RADZIOCH, Danuta
RAUCH, Joyce
REED, Michael
ROUTY, Jean-Pierre

RUBIN, Earl
SASSEVILLE, Denis
SCHURR, Erwin
SEIDMAN, Ernest G.
SHEEHAN, Nancy L
SHEPPARD, Don
SKAMENE, Émil
STEVENSON, Mary
SZABO, Jason
TCHERVENKOV, Jean
Ivanov
THOMSON, David M.P.
TSOUKAS, Christos
VINH, Donald
WARD, Brian
WILD, Gary

Medical Genetics and Genomics

BRAVERMAN, Nancy
DESROSIERS, Martin
DEWAR, Ken
FOULKES, William David
GILFIX, Brian
GLASS, Kathleen
JABADO, Nada
KAPLAN, Feige
KOENEKOOP, Robert K.
MITCHELL, John
MORGAN, Kenneth
PASTINEN, Tomi
PETERSON, Alan
ROSENBLATT, David
ROZEN, Rima
SHOUBRIDGE, Éric Alan
SLADEK, Robert
TRASLER, Jacquetta
VIDAL, Silvia

Mental Illness and Addiction

ABBOTT, Frances Vivien
ANNABLE, Lawrence
BEAUCLAIR, Linda
BENKELFAT, Chawki
BLEAU, Pierre
BROUILLETTE, Marie-Josée
CERVANTES, Pablo
CHARNEY, Dara Alexandra
CHOUINARD, Guy
DAIGNEAULT, Sylvie
FOMBONNE, Eric
GILL, Kathryn June
GOBBI, Gabriella
GOTO, Yukiori
GREENFIELD, Brian
HECHTMAN, Lily
HOFMANN, Herta Ann
KOLIVAKIS, Theodore T.
LAPORTE, Lise
LEYTON, Marco
LOW, Nancy
MARGOLESE, Howard
Charles
MINDE, Klaus
MOSKOWITZ, Debbie S.
MYHR, Gail
PALMOUR, Roberta
PIHL, Robert O.
ROUSSEAU, Cécile
YOUNG, Simon N.

Musculoskeletal Disorders

BERNATSKY, Sasha
BERRY, Gregory
BOBYN, John Dennis
BURMAN, Mark L
CHEHADE, Antoine
CHÉDEVILLE, Gaëlle
COLMEGNA, Ines
DIBATTISTA, Giovanni
FISHER, William D.
GOLTZMAN, David
HAGLUND, Lisbet
HAMDY, Reggie
HARVEY, Edward
HENDERSON, Janet
HENDY, Geoffrey
HEPPEL, Russell
JARZEM, Peter
KOMAROVA, Svetlana
KREMER, Richard
MARTINEAU, Paul
MCKEE, Marc D.
MORIN, Suzanne
MURSHED, Monzur
MÉNARD, Henri-André
OUELLET, Jean
PHILIP, Anie
PINEAU, Christian
RABBANI, Shafaat
RAUCH, Frank
REINDL, Rudy
RODD, Celia
SCUCCIMARRI, Rosie
STEFFEN, Thomas
STEIN, Michael
SÉGUIN, Chantal
TAIVASSALO, Tanja
TANZER, Michael
TURCOTTE, Robert E

Neurosciences

ANDERMANN, Eva
ANDERMANN, Frederick
ANTEL, Jack
ARNOLD, Douglas L.
ATKINSON, Jeffrey
AVOLI, Massimo
BACKMAN, Steven B.
BAKER, Curtis
BAR-OR, Amit
BARKER, Philip
BEDELL, Barry
BERNASCONI, Andrea
BOURQUE, Charles W.
BURNIER, Miguel
BUSHNELL, Catherine
CARBONETTO, Salvatore
CHALK, Colin
CHEN, Brian
CHEN, John Chanchiang
CLOUTIER, Jean-François
CODERRE, Terence J.
COLLINS, Donald Louis
COLMAN, David
DAGHER, Alain
DAVID, Samuel
DEL MAESTRO, Rolando
Fausto
DIKSIC, Mirko
DILENGE, Marie-Emmanuelle
DJORDJEVIC, Jelena

DRAPEAU, Pierre
DUBEAU, François
DUNN, Robert James
DURCAN, Liam
DURHAM, Heather
ELHILALI, Mostafa
EVANS, Alan
FELLOWS, Lesley
FINLAYSON, Roderick
FON, Edward A.
FOURNIER, Alyson
GAGNON, Isabelle
GANS, Mark
GENGE, Angela
GHOSH, Shuvo
GOTMAN, Jean
GOULET, Benoît
GUITTON, Daniel
HAEGERT, David
HAMEL, Édith
HASTINGS, Kenneth
HEMMERLING, Thomas
HESS, Robert
HOLLAND, Paul Charles
HYDE, Krista
JONES, Barbara Ellen
JONES-GOTMAN, Marilyn
KENNEDY, Timothy
KINGDOM, Frederick A.A.
KLEIN, Denise
KOBAYASHI, Eliane
LACHAPPELLE, Pierre
LADBON BERNASCONI, Neda
LAFONTAINE, Anne-Louise
LAPIERRE, Yves
LECANU, Laurent
LEONARD, Gabriel
LIMPEROPOULOS, Catherine
LUSSIER, David
MARCoux, Judith
MCPHERSON, Peter Scott
MENDOLA, Janine
MILNER, Brenda
MULLEN, Kathy
MURAI, Keith
NALBANTOGLU, Joséphine
PACK, Christopher
PETRIDES, Michael
PIKE, Gilbert Bruce
PLOURDE, Gilles
POSTUMA, Ronald
PTITO, Alain
RAGSDALE, David
RAO, Yong
READER, Andrew
RICHARDSON, John
RIOPELLE, Richard
ROSENBLATT, Bernard
ROY, Jean-Pierre
RUTHAZER, Edward
SADIKOT, Abbas F.
SCHIRRMACHER, Esther
SCHWEINHARDT, Petra
SHMUEL, Amir
SINNREICH, Michael
SOSSIN, Wayne
SOUCY, Jean-Paul
STELLWAGEN, David
STIFANI, Stefano

STROH, Thomas
SULLIVAN, Ronald M.
SZIKLAS, Viviane
SÉGUÉLA, Philippe Alain
TAMPIERI, Donatella
TEITELBAUM, Jeanne S.
THOMPSON, Christopher J.
TROJAN, Daria
VALOIS GOMEZ, Terasa
VAN MEYEL, Donald
VEILLEUX, Martin
WARE, Mark
WEIN, Theodore
WINTERMARK, Pia
ZATORRE, Robert

Respiratory Health

ALI, Nabeel
BAGLOLE, Carolyn
BENEDETTI, Andrea
BOURBEAU, Jean
BROUILLETTE, Robert
CANAKIS, Anne-Marie
CHAMPAGNE, Kateri
COSIO, Manuel G.
DIAL, Mary Sandra
EIDELMAN, David
FIXMAN, Elizabeth D.
GIAID, Adel
GONZALEZ, Anne
HAMID, Qutayba
HANRAHAN, John
HASTON, Christina
JACQUES, Louis
KAMINSKA, Marta
KIMOFF, Richard John
KOST, Karen
LANDRY, Jennifer Sophie
LANDS, Larry
LAUZON, Anne-Marie
LUDWIG, Mara Susan
MARTIN, James Gerard
MATOUK, Elias
MENZIES, Richard
MICHEL, René P.
MOREL, Johanne
NGUYEN, Anh Tu Duy
NOYA, Francisco J.D.
OLIVENSTEIN, Ronald
PAI, Madhukar
PERRAUD, Héléne
PETROF, Basil
POWELL, William S.
PULIGANDLA, Pramod
ROHLICEK, Charles
ROUSSEAU, Simon
SANT' ANNA, Guilherme
SCHWARTZMAN, Kevin

World Firsts



1877

Introduction of Lister's antiseptic system (T.G. Roddick)

1890

Development of culturing diphtheriabacilli (W.G. Johnston)

1952

Role of phosolipids in hormone signalling (M. L. Hokin)

1957

Invention of artificial cell (T. Chang)

1st kidney transplant in North America (K. McKinnon, J. Dossetor)

Discovery of GABA neuro transmitter (KAC Elliott, H. McLennan et al.)

1969

Discovery of carcino-embryonic antigen – tumour marker for cancer (P. Gold, S. Freedman)

1970

Connection between small airway diseases and cigarette smoking demonstrated (P. Macklem)

Development of PET technology

1980

Demonstrated that brain neurons regenerate (A. J. Aguayo)

First bone marrow transplant performed on a child in Canada (MCH)

1990

New surgical technique for damaged hearts (R. Chu-Jeng Chiu)

1992

Identification of a protein stimulating function of pancreatic islet cells (L. Rosenberg)

1994

BRCA1 breast cancer susceptibility gene identified (P. Tonin, S. Narod)

1998

Genetic test for BRCA1 and BRCA2 for French Canadian women at risk for hereditary breast and ovarian cancers developed (P. Tonin, S. Narod)



1932

Identification of pituitary and placental hormones (J.B. Collip)

1950

Discovery that drugs taken by pregnant women could result in birth defects (C. Fraser)

Role of phosolipids in hormone signalling (M. L. Hokin)

Elastic properties of the lung described (R. Christie, M. Becklake)

1st neuro-surgical treatment of epilepsy (W. Penfield et al.)

1965

1st artificial knee joint in the world (J. Miller)



1979

Use of electron microscope radioautography to identify new hormone targets (B. Posner, M. Van Houten, J. Bergeron)

1972

Presence of peptide hormone receptors in known target tissues (B. Posner)

Isolation of Prolactin from human pituitaries and establishment of 1st assay created (H. Friesen, H. Guyda)

1993

Cloned the bcl2 gene in mice and in humans (P. Gros, E. Skamene, S. Vidal, D. Malo)

Gene associated with neurofibromatosis discovered (G. Rouleau)

Gene associated with Lou-Gehrig disease discovered (G. Rouleau)

Gene associated with early atherosclerosis discovered (R. Rozen)



2002

Gene linked to a form of juvenile ALS identified (G. Rouleau et al.)

The HapMap Consortium to map human disease initiated (T. Hudson et al.)

Epilepsy mapping and method to assess, diagnose, prognose or treat achieved (G. Rouleau, P. Cossette)

Protein involved in wound healing and cancer progression discovered (A. Philip)

Tissue engineering of pancreatic islet cells achieved (L. Rosenberg)

Gene for epilepsy discovered (G. Rouleau, P. Cossette)

New technology for assisted reproduction developed (R-C Chian)

Gene associated with obesity discovered (T. Hudson, J. Engert et al.)

Drug targets for fungal infections identified (B. Turcotte)

2004

Method of preserving fertility in young women with cancer developed (S-L Tan)

Leprosy susceptibility genes identified (E. Schurr, A. Alter, M. Mira, M. Orlova)

Diagnostic test for Trypanosoma Cruzi Infection developed (B. Ward, M. Ndao)

Cryoleaf, a freezing device for eggs and embryos developed (S-L Tan, R-C Chian)

Antibodies associated with Lupus disease found (J. Rauch, R. Suban)

Drug target for pain control identified (G. Rouleau)

Biomarker for obesity discovered (A. Sniderman, K. Cianflone)

2008

Identification that apoB is the best index of the adequacy of LDL lowering therapy. (A. Sniderman)

2010

Identification of serum biomarkers for Chagas' disease (M. Ndao, B. Ward)

Discovery of the gene responsible for susceptibility to gastrointestinal neoplasia (W. Foulkes)

Rapid identification of hereditary genetic diseases (N. Jabado, J. Majewski)



1999

Vaccine for nerve regeneration developed (S. David)

Gene therapy with retinoid X receptor in cancer developed (R. Kremer)

1995

BRCA2 breast cancer susceptibility gene identified (P. Tonin, S. Narod)

First physical map of the human genome created (T. Hudson et al.)

Gene associated with localized muscular dystrophy identified (G. Rouleau)

Gene associated with tumour metastatic spread identified (P. Brodt et al.)

2003

Gene that controls susceptibility to TB discovered (P. Gros, L. Mitsosand et al.)

Immunodiagnostic test for human paratuberculosis developed. (M. Behr, M. Semret)

1st clinical trial of the use of cannabis in the treatment of chronic pain in Canada (M. Ware, G. Bennett, JP Collet, A. Gamsa, Y. Shir, S. Shapiro, T. Huynh)

Gene associated with liver cirrhosis developed (T. Hudson)

Protein associated with vessel growth in cancer discovered (M. Park, C. Saucier)

New primary therapies in cystic fibrosis (L. Lands et al.)

Use of genetically engineered stem cells in mice (A. Peterson)

2005

Evidence of inheritance of colon cancer found (J. Jass)

Treatment of Crohn's disease using Interleukin (IL)-1 achieved (D. Franchimont)

Electronic prevention of prescription errors developed (R. Tamblyn, A. Huang et al.)

Gene associated with premature aging discovered (D. Goltzman, D. Miao)

Device for egg collection in assisted reproduction developed (S-L Tan, W. Buckett)

2006

Risk associated with the use of Cox-2 inhibitors described (L. Levesque, J. Brophy, B. Zhang)

2007

Identification of human brain ordering centre (M. Petrides)

1st baby born from frozen eggs, matured in the lab (S-L Tan)

Diabetes gene discovered (C. Polychronakos, R. Sladek)

2009

New fundamental mechanism of how tumour cells communicate discovered (J. Rak et al.)

Discovery of new retinal gene involved in childhood blindness (R. Koenekoop et al.)

Automated anesthesia created (T. Hemmerling et al.)

Business Development

Through the research of its world-class faculty, The RI-MUHC is advancing innovative medical science discoveries for improving the life and the well-being of the public. Converting a promising scientific discovery into a successful treatment can take over twelve years and involve hundreds of millions of dollars — funding that is key in translating research but difficult to find. The Business Development Office (BDO) at the Research Institute assists researchers to bridge the funding and technology gaps that exist between promising discoveries and their transitioning to testing and ultimately commercial reality.



The BDO collaborates with researchers of the RI-MUHC to assess the technical and commercial potential of new research ideas; develop proof of concept and product development studies; network and link our investigators with biotechnology or pharmaceutical companies for the development of partnerships; identify new sources of funding and facilitate the grant submission process; stimulate and accelerate the development of intellectual property; foster and establish strategic partnerships nationally and internationally and negotiate and review research agreements on behalf of our investigators in collaboration with the Legal and the Contracts Offices at the RI. The BDO works also closely with McGill University's Office of Sponsored Research to evaluate the commercialization strategies of the discoveries originating from The RI-MUHC.

These activities have generated many leads and connected the RI-MUHC research programs with new funding initiatives. Amongst others, the BDO worked with Dr. Danuta Radzioch, Dr. Sam David and the McGill Spinal Cord Injury Clinical Research Unit to secure funding from the US Congressionally Directed Medical Research Program's (CDMRP) and the Spinal Cord Injury (SCI) Research Program. The funding is critical to perform proof of concept experiments to assess a novel treatment for patients with SCI in improving locomotor recovery and reducing tissue damage.

In conjunction with the Executive Office of the MUHC, Dr. Costas Karatzas organized the visit of a large delegation from Malaysia including the King of Malaysia, deans of medical schools, professors and government officials. The meetings with MUHC and McGill University resulted in the signing of several memoranda of understanding (MOUs) with leading Malaysian universities. These MOUs cover student and staff exchanges, training and the establishment of collaborative research programs in areas such as cardiovascular diseases and oncology.

Dr. Karatzas, in collaboration with Dr. Miguel Burnier, MD, PhD, and Dr. Bruno F. Fernandes, MD, PhD, leveraged through the MITACS Accelerate internship program a research contract provided by Alcon Canada Inc. The MITACS matching funds enabled them to hire five additional graduate students to work on the ongoing research program with the aim to evaluate new generation intraocular lenses and provide insight into the prevention of postoperative opacification of lenses. The funding provided the opportunity to the graduate students to work, both in university and industrial settings, while performing cutting edge research.

Says Dr. Karatzas, the Director of the BDO, "these initiatives represent an extension of The RI-MUHC's mission while allowing us to work closely with our investigators in order to transition their research for the benefit of patients."

Support from Foundations and Auxiliaries

Auxiliary of the Montreal General Hospital (The)

The Auxiliary of The Montreal General Hospital is a volunteer group of men and women dedicated to supporting the hospital and promoting its image in the community. The Auxiliary holds annual fundraising events and the money raised is used to purchase medical equipment, to sponsor annual research awards, and to support various projects that enhance patient care within the hospital and in some of the community organizations. Hospitality Corner, a branch of The Auxiliary, operates the 6th floor Gift Shop and Snack Bar with many volunteers, a magnificent catering service, Cedar Lobby Café, and Café des Pins near the Emergency Department. Tips received at all three restaurants are given to the MUHC Research Institute.

Cedars Cancer Institute

For nearly half a century, the Cedars Cancer Institute at the McGill University Health Centre (MUHC) has grown from a fledgling grassroots fund to an independent, mission-based cancer foundation, helping thousands of people along the way who are grappling with the ill effects of cancer. Cedars is dedicated to meeting the needs of all cancer patients, from young to old. The Sarah Cook Fund of the Cedars Cancer Institute is dedicated to pediatric oncology while Cedars CanSupport meets the needs of our adolescent and young adult (AYA) patients. From pediatric to geriatric, from initial diagnosis through to survivorship or palliation, Cedars is there for patients and their families at every step of their cancer journey.

In 2010-2011, the Cedars Cancer Institute through various activities was able to provide much needed funds to a variety of oncology related initiatives at the MUHC. Through events such as the 401 Bike Challenge, the Ride with Lance, the Dragonboat Race and Festival and the Raffle and Auction, Cedars was able to purchase state-of-the art diagnostic equipment, improve facilities for the treatment and care of cancer patients, and also provide emotional, practical, psychosocial and financial support to cancer patients and their families.

Highlights of financial contributions include: supporting the acquisition of the DaVinci SI Robotic Surgical System; supporting the MUHC Psychosocial Oncology Program; The MUHC/Cedars oncology E-Education modules; funding for the RVH Oncology Day Centre renovations and the purchase of state-of-the-art chemotherapy chairs for cancer patients and funding equipment for Esophageal cancer treatment at the MGH.

Our commitment to cancer research, education and awareness is fulfilled through our popular Cedars CanSupport “News You Can Use” free Public Lecture series, the Dr. Edward J. Tabah and Vivian Saykaly Visiting

Professorships, and also through our Henry R. Shibata Cedars Fellowships in Oncology research. In 2010-2011, Cedars awarded six Henry R. Shibata Cedars Research Fellowships including the Kate McGarrigle Fellowship in Sarcoma research and one Ocular Pathology Fellowship.

McGill University Health Centre (MUHC) Foundation

Throughout 2010-2011, the McGill University Health Centre (MUHC) Foundation has continued to work with MUHC partner Foundations to advance the \$300 million Best Care for Life campaign. Thanks to the generosity of our donors, the campaign has raised over \$230 million to date.

The MUHC Foundation, in partnership with the Fondation du Centre hospitalier de l'Université de Montréal, is actively engaged in a joint corporate campaign directed at major corporate donors. Significant donations have been received from The National Bank of Canada, Power Corporation of Canada, RBC Financial Group, Bell Canada and CIBC, to name but a few, with many more anticipated in the coming months.

The continued success of the MUHC's internal, or family campaign, which has received commitments of almost \$1 million, illustrates our community's support of the MUHC Redevelopment Project. Other significant contributions to the campaign from the Marjorie and Gerald Bronfman Foundation have supported renovations at the Montreal General Hospital in Gastroenterology and the Larry and Cookie Rossy Family Foundation have generously supported the purchase of a DaVinci Robot to enhance minimally invasive surgery in Oncology.

Through *the Best Care for Life* Campaign, the MUHC Foundation is supporting The RI-MUHC's matching funds for the Canada Foundation for Innovation grant of \$100 million to construct the new Research Institute at the Glen Campus. With regard to current and ongoing research, The Kate McGarrigle Fund has now awarded two \$20,000 fellowships to young researchers in oncology related fields. Additionally, given the generosity of funds established by the late Ernest Avrith and Mary Zilinskas Wallis, the MUHC Foundation continues to support research and patient care in the areas of liver transplant and geriatrics.

Support from Foundations and Auxiliaries (continued)

Montreal Chest Hospital Foundation

The Montreal Chest Institute (MCI) Foundation supports the healthcare professionals at the MCI—leaders in respiratory ailments such as asthma, chronic obstructive pulmonary disease (COPD), cystic fibrosis, pulmonary hypertension, obstructive sleep apnea, and Duchenne muscular dystrophy. The Foundation also funds pioneering research to treat and cure these devastating illnesses.

The MCI Foundation is very pleased to have funded the renovations of the MCI's Intensive Care Unit. The most important new project was the purchase of advanced diagnostic equipment to support the early detection and treatment of lung cancer. Several other meaningful projects relating to the quality of life of the MCI's patients were also funded.

Montreal Children's Hospital Foundation (The)

The generosity of visionary donors enabled The Montreal Children's Hospital Foundation to make disbursements of \$2 million in support of child health research in 2010-2011.

Among the major contributors were the Cole Foundation, Shire Canada, the Children's Leukemia Research Association, Leucan, the Foundation for the Foundation Fighting Blindness - Canada, and the Foundation for Retinal Research, as well as a number of loyal individuals. Their gifts led to significant research advances in areas such as oncology, ophthalmology, the study of allergies, and the treatment of attention deficit hyperactivity disorder.

The Montreal Children's Hospital Foundation continues to pursue its objective of raising \$100 million for the construction of the new Children's and its new Research Institute home on the Glen Campus. To date, this campaign has raised over \$86 million.

Montreal General Hospital Foundation

The mission of The Montreal General Hospital (MGH) Foundation is to support excellence in patient care, teaching and research at the MUHC. Over the past decade, the Foundation has contributed over \$144 million to the Hospital and Research Institute. Support from The MGH Foundation for research this past year remained steadfast.

In the past year, with the help of over 10,000 donors, the MGH Foundation contributed more than \$13.4 million to the Hospital and Research Institute to support excellence in patient care, teaching and research. Donor support for

Research Chairs also contributed to the recruitment and retention of nationally and internationally recognized clinical researchers. During 2010-11, more than 80 clinical researchers received support from the MGH Foundation. Nursing and nursing research were also the beneficiaries of generous ongoing support by the MGH Foundation.

Royal Victoria Hospital Foundation (The)

The Royal Victoria Hospital Foundation has always recognized that excellence in patient care begins with excellence in research. We have committed over \$3.2 million over the past two years alone to research projects touching a wide cross-section of medical disciplines. And knowing that the future of medicine depends on today's research, we continue to make it a priority to provide leadership support to the Research Institute through the visionary generosity of our faithful contributors.

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New Recruits

Dr. Bassam Abdulkarim, MD, PhD **Cancer**

Research activities: Phase II Trial of Concurrent Sutent, Temozolomide and Radiation Therapy followed by Adjuvant Sutent and Temozolomide for Newly Diagnosed GBM Patients with an Unmethylated MGMT.

Dr. Carolyn J. Baglole, PhD **Respiratory Health**

Research activities: Focuses on cellular/molecular pathways that regulate inflammation, cigarette smoke-induced lung disease, mechanisms of apoptosis, as well as toxicology and the aryl hydrocarbon receptor.

Dr. Olga Basso, PhD **Health Outcomes**

Current status: Associate Professor at the Department of Obstetrics and Gynecology and Department of Epidemiology, Biostatistics, and Occupational Health, Faculty of Medicine, McGill University.

Dr. Alain Biron, PhD **Health Outcomes**

Research activities: The creation and implementation of a Transition Office in a university-affiliated multi-site health care centre.

Dr. Fadi Brimo, MD **Cancer**

Research activities: Morphologic, clinical, and basic science studies in the areas of tumors of the genitourinary tract (prostate, bladder, and testis).

Dr. Issam El-Naqa, PhD **Cancer**

Recent accomplishments: Special recognition at the American Association of Physicists in Medicine (AAPM) by selection for presentation at the Laughlin Science Council Research Symposium.

Dr. Russell Hepple, PhD **Musculoskeletal Disorders**

Current status: Associate Professor and Associate Member of Division of Critical Care Medicine, McGill University Health Centre, McGill University.

Dr. Krista Hyde, PhD **Neurosciences**

Research activities: Brain, behavioural and genetic interactions in autism spectrum disorders.

Dr. Dennis Jensen, PhD **Respiratory Health**

Recent accomplishments: Canadian Lung Association/Canadian Thoracic Society Post-Doctoral Research Fellowship.

Dr. Mark Lathrop, PhD **Medical Genetics and Genomics**

Research activities: Past Wellcome Trust Principal Fellow and Professor of Human Genetics at the University of Oxford, Dr. Lathrop headed two of the major centres providing infrastructure for large-scale biological research in France: the Centre National de Genotypage (CNG) and the Fondation Jean Dausset – Centre d'Etude du Polymorphisme Humain (CEPH), the latter of which he was one of the founders.

Dr. Jacek Majewski, PhD **Cancer**

Research activities: Identifying mechanisms and downstream phenotypic effects of alternative mRNA processing in humans by using high throughput genomics and proteomics approaches.

Dr. Istvan Mucsi, MD, PhD **Endocrinology, Diabetes, Nutrition and Kidney Diseases**

Research activities: Studying the role of psycho-social factors in the modality selection for renal replacement therapy.

Dr. Emil Nashi, MD, PhD **Medical Genetics and Genomics**

Current activities: Assistant professor at the Divisions of Clinical Immunology and Allergy and Rheumatology, McGill University Health Centre.

Dr. Emilie Soisson, PhD **Cancer**

Current status: Medical Physicist at the Department of Medical Physics, McGill University Health Centre.

Dr. Ron Sullivan, PhD **Neurosciences**

Current status: Assistant Professor at the Department of Psychiatry, McGill University.

Dr. George Thanassoulis, MD **Cardiovascular Disease and Critical Care**

Recent accomplishments: Awarded the Colonel Edward T. Renouf Research Fellowship.

Dr. Pia Wintermark, MD **Neurosciences**

Research activities: Understanding the causes and consequences of brain injuries in high-risk newborns.

Dr. Donald Vinh, MD **Infection and Immunity**

Current status: Assistant Professor at the Department of Medicine, Division of Infectious Diseases, at the Division of Allergy and Clinical Immunology, and at the Department of Medical Microbiology, McGill University Health Centre.

Core Facilities

Cancer Research

The Rosalind and Morris Goodman Cancer Centre and the McGill Life Science Complex have at their disposal and offer the services of several in-house core facilities. These facilities provide the GCC members and the McGill research community access to advanced technical expertise with state-of-the-art equipment. Facility services are also available to the outside scientific community in order to enhance the level of collaborative research. Available facilities are: Transgenic Mouse Core Facility, Histology Core Facility, Hybridoma Core Facility, Imaging Core Facility, Mouse Phenotyping, Dissection Microscopy, Fluorescence Imaging, Flow Cytometry, High. Other services are also available through the Animal Resources Centre: Veterinary Pathology. For more information: cancercentre.mcgill.ca/research

Clinical Research Cord Blood Bank

The MUHC Clinical Research Cord Blood Bank opened its doors in October 2007. The facility specializes in storing cord blood units too small for public banks but adequate for other clinical applications that require a low volume of stem cells. It provides isolation of hematopoietic stem cells or other components from the umbilical cord blood at a low price. In a structured program of quality and standardized manufacturing processes, it meets the standards of good laboratory practice and the requirements of Health Canada. This unique bank in Canada contains cord blood units that can be used safely in clinical research projects. A detailed research project and a consent form must accompany all applications. A research ethics committee recognized by the Unit for Ethics of the Government of Québec or by the Panel on Research Ethics of the Canadian Government must approve projects.

Endocrinology

Molecular Imaging Core Facility (RVH) provides access to Confocal Microscopes with high resolution immunofluorescent analyses on fixed samples and

tissue and for live cell imaging.
Director: Dr. Stéphane A. Laporte

Proteomic Services – Mass spectrometric analysis and identification of proteins - service provided by The RI-MUHC.

Director: Dr. Tommy Nilsson

Genomics

Genomics at the McGill University and Genome Quebec Innovation Centre, originally established at the MUHC, provides DNA sequencing, genotyping, microarray, and informatics technologies for over 700 scientists each year. The Centre provides access to the latest genomics technologies so that researchers may discover causes and therapies for common diseases and access core facilities that are essential for large research projects in human health.

Immunophenotyping Platform

We are proud to announce the opening of The RI-MUHC Immunophenotyping Platform, the first of its kind at the MUHC, and cornerstone for the future Glen Yard Hospital campus. Located on the 11th floor of the Livingston wing of the Montreal General Hospital, the Platform offers a variety of multiparametric flow cytometry and cell sorting services and training to all MUHC researchers and clinicians, as well as researchers from other affiliations.

The Platform is currently equipped with a BD FACSAria II (high-speed cell sorter), BD FACSCanto II (3 lasers), a more powerful 5-laser Fortessa (17 fluorochromes) flow cytometer, and required computer-based analysis workstations. The Platform offers flow cytometric analysis, cell sorting services and a range of analytical tools and training sessions on a fee-for-service basis. In addition, standard operating procedures will also be made available for researchers for various fundamental and clinical applications. The Platform will be undergoing substantial infrastructure growth in the near future in order to better accommodate various translational and clinical studies.



Infection and Immunity

The Infection and Immunity Core Facility offers a variety of services including automated sequencing, confocal imaging, SELDI-ToF mass spectroscopy, access to Levels 2 and 3 biosafety labs and animal facilities, and microarray technologies. Moreover, the Infection and Immunity Axis now benefits from a state-of-the-art, immune phenotyping platform which provides researchers and clinicians with access to training and use of multi-parametric flow cytometry and cell sorting.

Musculoskeletal

Services for X-ray and micro CT imaging, histologic and histomorphometric analyses of mineralized tissues and for the analysis of a variety of cytokines and growth factors relevant to skeletal health and disease are available through the Centre for Bone and Periodontal Research. Consultation in small animal models, biomaterials, stem cells and devices for bone tissue engineering is available to members of the research community and private sector partners through members of the Musculoskeletal Axis.

Neuroscience

The new Brain Imaging Centre (BIC) at the MNI will facilitate the development of new techniques for imaging humans and animals, and for creating new ways to unite molecular biology and brain-imaging confocal microscopes. BIC's world-class facilities include some of the most advanced MR, PET and MEG imaging devices available. In addition to scanners used for human and primate studies, the BIC has high-tech scanners designed specifically for use with small animals. Image processing and other processor intensive tasks are completed using the BIC's first-class computing system. For more information: www.mni.mcgill.ca

Procure Quebec Prostate Cancer Biobank

This Biobank is a long-term collaborative study between Procure Alliance, a not-for-profit prostate-cancer organization,

and Québec's four universities with teaching hospitals, namely Université de Montréal, McGill University, Université de Laval and Université de Sherbrooke. The goal is to collect and store research-grade human tissues and associated data from men with prostate cancer, and those at risk, for research purposes. Materials and data are stored in the research institutes of participating university hospitals, and made available to researchers. To date, the Biobank has collected samples and data from over 1,000 men with prostate cancer.

Respiratory Health

Core services in the following areas are available: molecular pathology, tissue culture, animal physiology, molecular cloning and imaging facility. A tissue bank, situated at the RI/MCI site, contains tissues and samples from asthmatics, subjects with COPD or cystic fibrosis, as well as from healthy subjects.

Sheldon Biotechnology Centre

Located in the Duff Medical Building, the Sheldon Biotechnology Centre provides life-science researchers with core technologies to analyze biomolecules. Services and training include: multiplex, surface plasmon resonance; peptide synthesis; protein sequencing; and mass spectrometry. For more information: www.mcgill.ca/sheldon

Vivarium

The Research Institute supports animal facilities at the MUHC and the Montreal Neurological Institute. The Animal Care Committee reviews and approves protocols prior to the start of any project that will use animals.

Funding by Source

Institutional Grants All Funding 2010-11

CFI - RHF	\$15,670,000
FRSQ - CIM	\$515,224

Granting Agencies All Funding 2010-11

Canadian Institutes of Health Research (CIHR)	\$49,720,064
Other (various granting agencies)	\$21,254,072
Pharmaceutical Agreement	\$14,348,576
Internal Funds (McGill/MUHC/The RI-MUHC)	\$9,225,861
Canada Foundation For Innovation (CFI)	\$6,907,135
Fonds de la recherche en santé du Québec (FRSQ)	\$5,681,935
Provincial Agencies	\$3,661,286
Federal Agencies	\$3,422,411
Canada Research Chairs	\$3,308,400
National Institute of Health (NIH)	\$2,923,037
Natural Sciences and Engineering Research Council of Canada	\$2,208,929
Multiple Sclerosis Society	\$2,139,176
Ministère de la Santé et des Services sociaux du Québec	\$1,901,307
National Centres of Excellence	\$1,534,002
Canadian Cancer Society	\$1,503,283
Réseaux - Fonds de la recherche en santé du Québec	\$1,502,322
National Cancer Institute of Canada (NCI)	\$1,413,659
Genome Quebec / Genome Canada	\$1,271,276
Health and Welfare Canada	\$752,799
Canadian International Development Agency	\$623,272
Juvenile Diabetes Research Foundation International	\$358,973
Department of National Defence	\$320,315
Heart and Stroke Foundation of Canada	\$320,315
Total	\$153,007,936

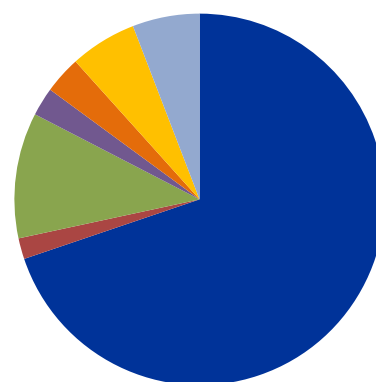
Financials – Quick Stats

Statement of operations year ended March 31, 2011

Operations & Grants Combined Total 2011 (Millions \$)

Revenues

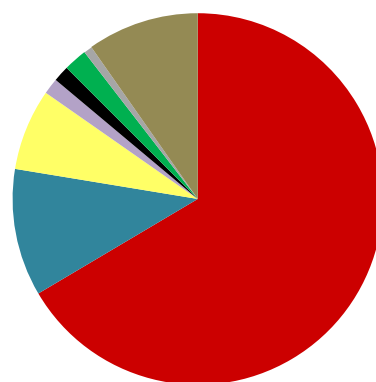
Peer Review Grants	106,977,456
Non Peer Review Grants w/o Overhead	2,859,332
Non Peer Review Grants with Overhead	16,470,688
Federal Grants' Indirect Costs (McGill)	3,819,055
FRSQ Support	5,006,141
Foundation, Donations	8,918,574
Income from cash, investments and other with McGill Overhead	8,956,690



Total Revenue 153,007,936

Expenditures

Salaries and Fringe Benefits	102,992,882
Laboratory and Office Supplies	17,238,826
Animal Board and Purch, Minor Equip, Travel and Other	11,026,492
Amortization Expense - Equipment	2,157,216
Building Occupancy, Renovations and Support	2,160,863
Transfer to partner institutions, net of recoveries	3,155,813
Telecommunications	1,140,020
Redevelopment	15,059,018



Total Expenditures 154,931,130

(Deficiency) excess of revenue over expenditures (1,923,194)



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The Research Institute of the McGill University Health Centre (The RI-MUHC) is a world-renowned biomedical and health-care hospital research centre. Research is organized by eleven research axes (or programs). Located in Montréal, Québec, Canada, the Institute is the research arm of the McGill University Health Centre affiliated with the Faculty of Medicine at McGill University. The Institute supports over 600 researchers, over 1,200 graduate students and post-docs and fellows devoted to a broad spectrum of fundamental and clinical research. Over 1,000 clinical research studies are conducted within our hospitals each year. The Research Institute of the MUHC is supported in part by the Fonds de la recherche en santé du Québec (FRSQ). www.muhc.ca/research/

This Annual Report was produced
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Many members of the Research Institute's team have contributed their time and talents to the preparation of this year's annual report. Thanks to all of them. A special thank you to Panagiota Arhontou, Judith Horrell, Daniela Zorzetti, Alison Burch and Susan James.



L'Institut de recherche
du Centre universitaire de santé McGill
The Research Institute
of the McGill University Health Centre

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The Research Institute of the McGill University Health Centre
2155 Guy Street, 5th Floor
Montréal, Québec H3H 2R9
Telephone: 514 934-8354
www.muhc.ca/research