2011 Research Report

understanding life IMPROVING HEALTH

University Health Network

Toronto General Hospital Toronto Western Hospital Princess Margaret Hospital

University Health Network (UHN) consists of the Toronto General Hospital (TGH), Toronto Western Hospital (TWH) and Princess Margaret Hospital (PMH). The scope of research and complexity of cases at UHN have made it a national and international source for discovery, education and patient care. It has the largest hospital-based research program in Canada, with major research in transplantation, cardiology, neurosciences, oncology, surgical innovation, infectious diseases and genomic medicine. UHN is a research hospital affiliated with the University of Toronto (UT).

TABLE OF CONTENTS

UHN RESEARCH: A SNAPSHOT

Senior Scientists	146
Scientists	42
Affiliate Scientists	76
Assistant Scientists	4
CSRC/CRU Members	271
Total Researchers	539
Fellows	452
Graduate Students	400
Total Trainees	852
Technical and Support Staff	1,410
Research Space	745,000 sq ft
Publications	1,915
Total Funding	$253,245,000

INTERNATIONAL RESEARCH ADVISORY BOARD

University Health Network Research Report 2011. Published by the Office of the Vice President, Research, UHN. Graphic design, writing and production by UHN Research Communications. Data provided by UHN Research Support Services. Respective data types are accurate as of December 31, 2010 (publication count year-end), March 31, 2011 (fiscal year-end) or June 30, 2011 (academic year-end). Photographs courtesy of Benjamin Pakuts, Yuan Lew, Ambrosio Dimagiba, Lars Hagberg, Canada Newswire and various sources including John Loper (UHN Photographics). Some figures may be rounded and/or may include data not represented in Institute data. Publications jointly authored by investigators at multiple UHN Institutes are counted only once in the UHN Research total. Reseachers who have more than one affiliation within an Institute, or between Institutes, are only included once in the total count. Total funding includes external and core funding. †*Dr. Steinman passed away September 30, 2011.*

Welcome Message

Understanding life can mean different things to different people. At UHN, we seek to improve health by understanding life at several levels.

Our quest begins with looking into the life of a cell. Heart cells, blood cells, lung cells, brain cells—all are highly specialized units with unique abilities. The life of a cell involves a myriad of molecular and biochemical interactions, genes switched off and on, proteins that accumulate and then dissolve and, in many cases, a planned and programmed death. Our understanding of the normal life of a cell is the basis for detecting and assessing deviations from the norm which can have catastrophic consequences including the malignant transformation of tumours and the failure of pancreatic islet cells to produce insulin. To improve health, we need to understand the life of a cell.

Cells do not act in isolation so we also have to understand the life of networks of cells. These networks can result in compact,

VICE PRESIDENT, RESEARCH, UHN

Christopher J. Paige, PhD, FCAHS

highly structured organs like a heart where cell connectivity results in regular rhythmic contraction, or skin where interconnected layers of cells form the first line of defense in a hostile world of infection. Other networks are composed of widespread, highly mobile units like the immune system which permeates throughout the body. In all cases, cells communicate with each other through electrical, chemical or physical signals and a breakdown in this communication can lead to movement disorders, heart failure or autoimmune disease, among others. To improve health, we need to understand cellular networks.

PRESIDENT AND CEO, UHN

Robert S. Bell, MDCM, MSc, FACS, FRCSC

With rare exceptions, the human body needs all of its organs and cellular networks to function properly and work together as an interconnected system. The components of the system exert critical influence on each other, which is why it is the rule rather than the exception that co-morbidities are common. To improve health, we also need to understand how systems are related and regulated.

Just as cells interact to form networks to achieve critical functions – so too do people. Understanding the life of an organization like a research hospital is one of our most important tasks. How can specialists be brought together to develop and deliver multidisciplinary care to complex cases? How can we enhance the patient experience both in terms of outcomes and satisfaction? How can we improve the delivery of health care to ensure sustainability while maintaining quality? To improve health, we absolutely need to understand ourselves, and to use UHN as a living laboratory where we can study and optimize how we deliver care to improve health.

At UHN, our goal is to understand 'life' at all of these levels and to use that understanding to improve health. We accomplish this by attracting and retaining some of the world's best medical researchers and practitioners and partnering with the University of Toronto and our hospital neighbours to use this knowledge to improve health. We invite you to read through this report for a glimpse of how we've pursued this quest to understand life and impact patient care by improving health in 2011.

The Research Hospital of the Future

UHN Strategic Planning

In early 2011, UHN's Board of Trustees approved the hospital's new strategic plan entitled *University Health Network Strategic Directions 2016 – Global Impact, Local Accountability*. This new corporate plan—a culmination of an institution-wide planning initiative led by President and CEO Dr. Robert Bell—is informed by the strategic directions of UHN's programs and will enable the innovative ambitions of these programs over the next five years. It is organized by the five priority domains identified in UHN's purpose statement, "**We** are a **caring**, **creative**, and **accountable academic** hospital transforming health care for our patients, community, and the world."

In this document, the **creative** domain, UHN's research and innovation core, has identified its strategic theme as "Become the Research Hospital of the Future"—this is the hospital that we envision UHN becoming in the next 15-20 years. To do this, it will pursue three goals:

Further our understanding of the basis of health and disease through biology and technology platforms

Leverage experimental therapeutics and health services to impact the lives of patients

Enable the collection, analysis and application of health information

UHN Research, led by Vice President, Research Dr. Christopher Paige, has established five priority themes that will act as our guiding principles in realizing these goals:

Mechanisms of Disease
Experimental Therapeutics
Medical Technology
Informatics
Health Services Research

In the long-term, the goals of the research priority themes and the input from the UHN community will culminate in a roadmap by April 2012.

Health Services Research: A New Priority

UHN's expansive environment provides a unique venue to study and improve the delivery of health care through the conduct of health services research (HSR). HSR has a presence at UHN in the context of academic research and quality improvement, assurance and organizational development, but has not previously been formally acknowledged. As the result of ongoing strategic planning, HSR is now recognized by UHN as a platform, joining other systematically organized areas of research. This will strengthen the vital role HSR plays in ensuring that health care remains at the forefront of innovation and continually improves, along with the health and well-being of patients.

"The roadmap will be a 'living' document that will strategically evolve with trends in innovation and health care. It will guide UHN's path to becoming the Research Hospital of the Future." - Dr. Christopher Paige

Toronto Rehab Joins UHN

July 1, 2011 marked the integration of UHN with the Toronto Rehabilitation Institute (Toronto Rehab). This merger, which brings together four hospitals affiliated with the University of Toronto, will facilitate the process of health care, and all aspects of care—from diagnosis and treatment through to rehabilitation and recovery. Toronto Rehab President and CEO Mark Rochon explains, "Bringing these two organizations together will enable clinicians to initiate rehabilitation much sooner in the acute care phase of treatment which will enhance the quality and continuity of care as well as outcomes for patients." The integration of these world-class hospitals will provide long-term benefits for the health care system as a whole.

Research at UHN has also expanded to include Toronto Rehab's research program, which was created in 2001 with a grant from the Ontario Ministry of Health and Long-Term Care. The goal of this program is to develop new and more effective treatments, assistive devices and technologies to help people live as fully and independently as possible. Research at Toronto Rehab focuses on three priority areas: preventing accidents and injuries; providing post-acute care to help people return to as full participation in society as possible after their treatment; and helping older people and people with disabilities and their family caregivers continue to live in their own homes as they age. Toronto Rehab has nine teams that work on these priority areas: artificial intelligence and robotics, cardiopulmonary fitness, cognition, communication, mobility, neural engineering and therapy, optimization of the rehabilitation system, sleep and the upper airway and technology.

Toronto Rehab is home to the most advanced rehabilitation research facilities in the world. These facilities include seven simulated environments for developing and testing systems that range from

"This is a fabulous opportunity to address problems that people experience before and after being acute care patients. The integration of our efforts will strengthen both prevention and reintegration into society," – Dr. Geoff Fernie, Institute Director of Toronto Rehab

Dr. Geoff Fernie (centre) and some of Toronto Rehab staff

technologies in the home to help people maintain their independence, through technologies in health care institutions to reduce stress on caregivers and support better hand hygiene, to better boots and shoes that reduce falls on ice and snow.

UHN Vice President, Research, Dr. Christopher Paige expresses his excitement over the joining of the Toronto Rehab research program, "Toronto Rehab has built an excellent program in rehabilitation research over the last decade with a number of world-first innovations and there are clearly many programs at UHN which stand to benefit greatly from enhanced collaboration."

"Everyone who has been part of this process has seen the enormous opportunity for patients, research and health care professionals in this new organization," adds Dr. Robert Bell, President and CEO of UHN. "I am committed to the vision for the new UHN which now combines outstanding acute services with excellent post-acute care in an environment that supports inter-professional care, education and research."

(L-R) David Bragg (Chair, Toronto Rehab Board of Trustees), Mark Rochon, Dr. Robert Bell and John Mulvihill (Chair, UHN Board of Trustees) signing the Integration Agreement

Pioneering Stem Cell Research

Drs. James Till and Ernest McCulloch

The discovery of blood-forming stem cells by Drs. James Till and Ernest McCulloch "...revolutionized our concepts of blood cell development and altered the course of cancer research by offering a rationale for bone marrow transplantation," says Dr. Christopher Paige, Vice President, Research.

This discovery overturned convention by defining cells based on function rather than morphology. They created an assay to measure two trademarks of stem cells: self-renewal and the ability to differentiate into other cell types. Through further experiments, they established the first practical definition of a stem cell, providing the spark that ignited the entire field of stem cell research.

In recognition of their achievements, Drs. Till and McCulloch were presented with numerous awards, including the coveted Gairdner Foundation International Award (1969) and the Albert Lasker Award for Basic Medical Research (2005)—two of the most prestigious medical science awards.

On February 1, 2011—the 50th anniversary of the publication of their discovery—UHN held a tribute to acknowledge their accomplishments. Their work has not only established Toronto as the birthplace of the stem cell, but also as a centre for stem cell innovation by inspiring the next generation of stem cell researchers.

Watch UHN and University of Toronto researchers describe the impact Drs. Till and McCulloch have had on their careers.

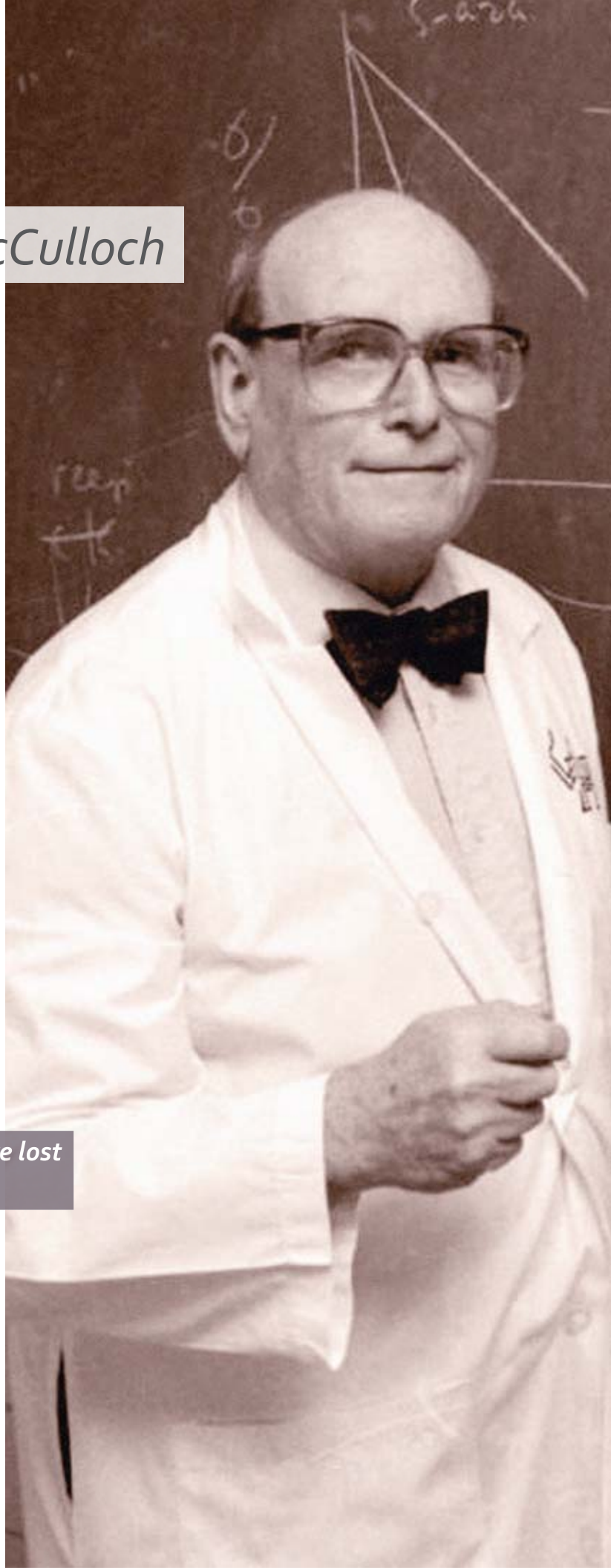
Remembering Ernest McCulloch

Dr. McCulloch was born in 1926 in Toronto. He completed his medical degree at the University of Toronto and trained briefly at the Lister Institute in London, England, before returning to Toronto to begin his research career at the newly formed OCI in 1957. In addition to being an inspirational researcher and leader at OCI and the University of Toronto's Institute of Medical Science, he was a loving and devoted father to his five children. Dr. McCulloch passed away on January 20, 2011.

Dr. McCulloch will be greatly missed at UHN. He will be remembered as a major advocate of collaboration: trained as a hematologist, he worked closely with Dr. Till, a biophysicist, in stem cell research, while the two maintained a lifelong friendship. He was known as a 'big picture' thinker, keeping his eye on the greater goal of therapeutic outcomes for cancer patients. He was also a mentor for young stem cell scientists. "Dr. McCulloch was truly an inspiration to decades of scientists," says Dr. Mark Minden, OCI Senior Scientist and former trainee of Dr. McCulloch. His lifework will continue to have an impact internationally and at UHN, where his spirit of collaboration, motivation and scientific rigor lives on.

"The University of Toronto and UHN have lost a great champion." – Dr. Christopher Paige

Learn more about the life of Dr. Ernest McCulloch.



Dr. Ernest McCulloch (1926-2011)

TGRI Welcomes Acclaimed New Director

"We have a truly unique combination of world class facilities, innovative researchers and dedicated health care professionals all striving to answer questions and provide solutions for our patients."

This past May, TGRI welcomed its new Director, Dr. Mansoor Husain. As a specialist in cardiovascular disease and nuclear cardiology, Dr. Husain brings outstanding clinical and research credentials to the role. He is currently a Senior Scientist at TGRI, Director of Research at UHN's Peter Munk Cardiac Centre and Director of the Heart & Stroke/Richard Lewar Centre of Excellence at the University of Toronto. In addition, he is affiliated with the McEwen Centre for Regenerative Medicine and recently served as the President of the Canadian Hypertension Society.

As TGRI Director, Dr. Husain intends to improve the focus of the Institute and engage trainees in the research process. "I hope to better integrate the amazing human resources and infrastructure we have at TGRI into disease-focused research teams that interact in meaningful ways with hospital-based medical programs. I believe that this will be critical to increasing our capacity for patient-focused research and thus more rapidly enable innovations in patient care," says Dr. Husain. "I also hope to re-launch resources for our investigators, including a TGRI Equipment Fund and a TGRI Trainee Awards Program. To build some enthusiasm for these initaitives, my first goal is to reach out and engage our researchers and hospital leaders—I hope our staff will share their ideas with me. I am here to help them move forward."

Dr. Husain's own research program focuses on the molecular events controlling the growth and development of vascular smooth muscle cells and the creation of genetic and experimental models of cardiovascular disease. He received his MD degree from the University of Alberta in 1986. His subsequent clinical and research training was completed at St. Michael's Hospital, UHN, the Massachusetts Institute of Technology and Harvard Medical School. He has more than 60 publications and is the recipient of a number of awards for his clinical and research work, including the Moshier Memorial Gold Medal from the University of Alberta, the Allan Bruce Robertson Young Investigator Award from the Clinical Research Society of Toronto and the William Goldie Prize from the Department of Medicine at the University of Toronto. Dr. Husain replaced Dr. Richard Weisel, who served as Director from 2005 to 2011.

Year in Review

Selected research events from 2011

UHN and UT Create New Institute

(L-R) Paul Alofs (President and CEO, PMHF) , Dr. Christopher Paige, Carlo Fidani, Drs. David Jaffray, Mary Gospodarowicz (Program Medical Director, PMH Cancer Program) and Robert Bell at Techna launch

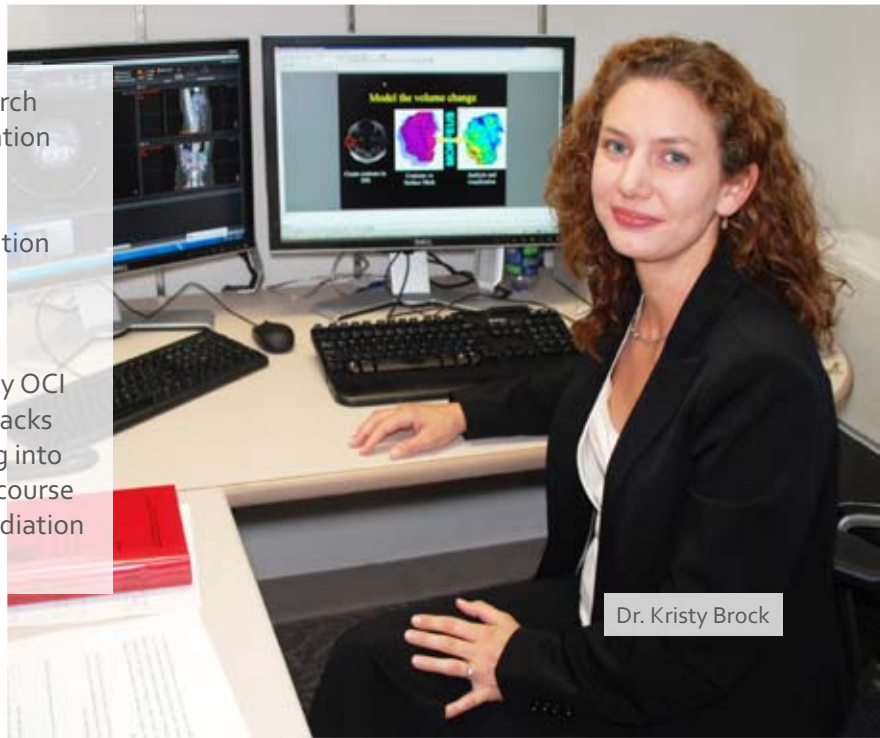
UHN, in collaboration with the University of Toronto (UT), celebrated the launch of the Techna Institute for the Advancement of Technology for Health on November 9, 2011. Led by Dr. David Jaffray, Techna is a new research institute focused on addressing unmet clinical needs through the advancement of novel technologies. It will serve as a vital bridge between clinicians and researchers. Techna is funded in part by The Princess Margaret Hospital Foundation (PMHF) and a generous donation from Carlo Fidani.

The Institute will encourage collaboration through the shared use of multiple existing facilities at UHN, including the Spatio-Temporal Targeting and Amplification of Radiation Response Innovation Centre and the Guided Therapeutics program. With over $100M in available resources, Techna will create new and exciting research partnerships while bringing innovative technologies to patient care.

UHN Radiation Medicine Tools Licensed to RaySearch Laboratories

UHN has signed a licensing agreement with RaySearch Laboratories regarding deformable image registration technology developed at PMH. The agreement, licensed through UHN's Technology Development & Commercialization (TDC) Office, allows for the integration of the research software "Morfeus" into RaySearch's commercial radiation treatment planning system.

Developed by a team of scientists and physicians led by OCI Scientist Dr. Kristy Brock, Morfeus is a program that tracks how a dose of radiation is delivered to a patient, taking into account physiological changes in the patient over the course of treatment. This information will be used to refine radiation treatment and help reduce the risk for side effects.



Dr. Kristy Brock

Charles Tator Honoured with Global Impact Award

UHN's Global Impact Award was presented to TWRI's Dr. Charles Tator in recognition of his pioneering research in spinal cord injury and international leadership in the prevention of head injury.

Dr. Tator's contributions to the field include developing the first acute spinal cord injury unit in Canada, demonstrating that post-traumatic ischemia is a major secondary injury mechanism and inventing the inclined plane technique of functional assessment. His research has expanded to sports and recreational injuries to the brain and spine with the development of the Krembil Neuroscience Centre Sports Concussion Project.

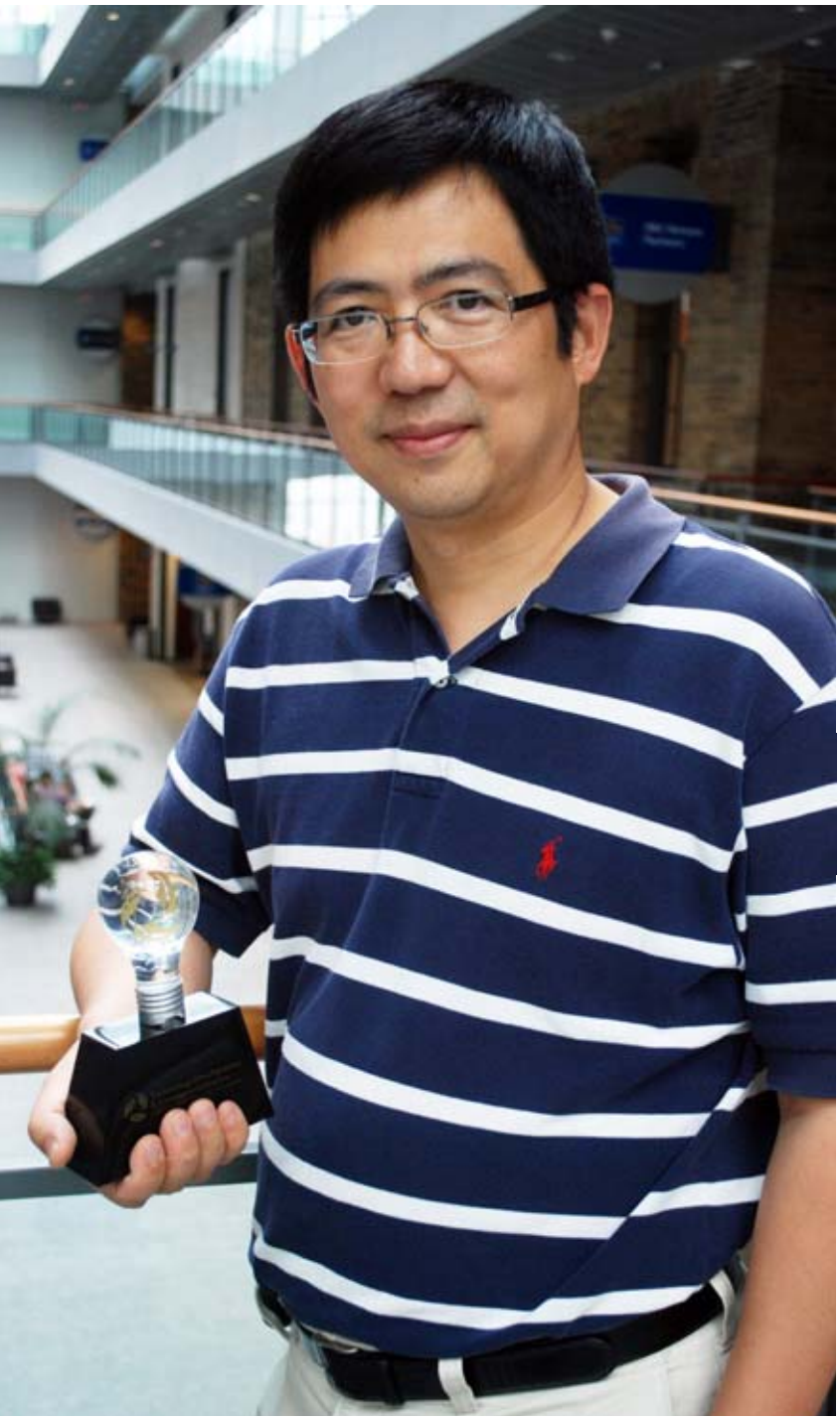
UHN and CFL Join Forces to Form Concussion Research Awareness Program

Dr. Charles Tator, in conjunction with the Canadian Football League (CFL), has announced the development of the Krembil Neuroscience Centre Sports Concussion Project. This program will evaluate the link between repeated concussions and deterioration of brain function in athletes and non-athletes and develop a concussion safety education program.

Currently, five former CFL players are planning to donate their brains to the study. Dr. Tator comments, "I think it's a thrill when someone of their stature says, 'I believe in your project, and when the time comes, you can have my brain.' They are putting their confidence in us to find the answers."

Dr. Charles Tator

Gang Zheng Named UHN Inventor of the Year



Dr. Gang Zheng

UHN's 2010 Inventor of the Year Award was presented to OCI's Dr. Gang Zheng. This award, sponsored through UHN and TDC, is presented to a UHN researcher who has made an outstanding and inventive contribution to patient-oriented biomedical research.

Dr. Zheng's invention focused on the creation of a unique organic nanoparticle delivery platform capable of transporting cancer therapeutics directly to tumours. This technology could potentially reduce side effects in patients due to the nontoxic nature of the nanocarriers and the targeted delivery of the drugs. UHN, in collaboration with the Ontario Institute for Cancer Research, has recently formed a Toronto-based biotechnology company called DLVR Therapeutics Inc. to rapidly advance the commercialization of this technology for clinical use.

New CIHR Funding for Nanomedicine Research

Dr. Gang Zheng and colleagues were awarded new funding to advance nanomedicine research from the Canadian Institutes of Health Research's Emerging Team Grant: Regenerative Medicine and Nanomedicine program. The team will receive $2.32M over five years to support the operation of the project.

The research project, entitled "*Nanotechnology-enabled image-guided interventions in vascular and lung diseases*", will translate innovations in nanotechnology into commercially viable, clinical trial-ready products by focusing on developing nanotechnology-enabled image-guided treatments for lung cancer and vascular diseases. The multidisciplinary research team includes UHN co-investigators Drs. Brian Wilson, David Hwang, Ren-Ke Li, Kazuhiro Yasufuku and the University of Toronto's Dr. Warren Chan.

(L-R) Dr. Gordon Keller, Robert Klein (Chair, Governing Board of the California Institute for Regenerative Medicine), Dalton McGuinty (Premier of Ontario), Dr. Eric Hoskins (Ontario Minister of Children and Youth Services) and Robert McEwen at Stem Cell City launch

McEwen Centre Launches Stem Cell City

June 15, 2011 marked the kick-off of Stem Cell City, an initiative by UHN's McEwen Centre for Regenerative Medicine to raise awareness about stem cell research and to allow people to articulate their support of using regenerative medicine to defeat the major diseases of our time. The Centre's Director, Dr. Gordon Keller, and co-founders Cheryl and Rob McEwen announced the launch of this exciting project. They encouraged everyone to join in their crusade to fight disease through the support of regenerative medicine.

Join Stem Cell City.

UHN's New Office of Research Trainees

On July 18, 2011, UHN launched the Office of Research Trainees (ORT) to help enhance support for the development of students and postdoctoral fellows. Leading this initiative is Dr. Linda Penn, who was appointed as the ORT Director.

ORT's mission is to showcase UHN's strong research environment; represent, support and enhance the quality of research training within UHN; facilitate information exchange and interaction amongst trainees and help trainees obtain external funding.

Dr. Linda Penn

UHN Announces Joint Venture with CPDC

UHN and the Centre for Probe Development and Commercialization (CPDC) announced a joint venture—the Canadian Molecular Imaging Probe Consortium (CanProbe)—to advance the development and use of medical isotopes for diagnosing and treating cancer and other serious diseases. CanProbe will establish a new research centre in Toronto, supplying molecular imaging probes to support research and clinical imaging programs for UHN-affiliated hospitals. The Centre will also introduce new imaging probes to Ontario through its own research efforts and manufacture probes that are used by the global nuclear medicine community.

Bringing Innovative Cancer Therapeutics to Canadians

The Princess Margaret Hospital Phase II Consortium (PMHC) has renewed its third contract through the National Institutes of Health to design, develop and conduct early phase clinical trials of agents, sponsored through the National Cancer Institute's Cancer Therapy Evaluation Program. PMHC, led by Dr. Amit Oza, will continue to conduct innovative clinical trials with promising combination therapies that are pivotal for drug development and enable PMH's clinical trials program to provide oncology patients with rapid access to novel anti-cancer therapies. As a contract holder since 2001 and the only non-US site funded, PMHC has accrued more than 1,400 patients on early phase clinical trials with participating sites in British Columbia, Alberta and Ontario.

(L-R) Drs. Amit Oza, Lillian Siu and Malcolm Moore

OCI/PMH Selected as Member Site in Cancer Immunotherapy Trials

OCI/PMH has been selected as one of 27 institutions, and the only institution outside of the US, to participate in the Cancer Immunotherapy Trials Network (CITN), funded by the National Cancer Institute. Led by Dr. Pamela Ohashi, UHN will conduct phase I and II clinical trials in the area of cancer immunotherapy and will focus on using new agents and approaches to improve the ability of the patients' own immune systems to fight cancer. Participation in the CITN will strengthen UHN's position globally as an emerging centre for immune therapy.

Landmark Donation from Lundbeck Canada to TWRI

(L-R) Marie Gagné, Gleb Filippov, Dr. Susan Rotzinger, Noam Ship, Stuart McBurnie and Dr. Sidney Kennedy

Lundbeck Canada has made a landmark donation of $2.7M to support pioneering research to identify biomarkers that will enhance the treatment of patients suffering from depression and bipolar disorder.

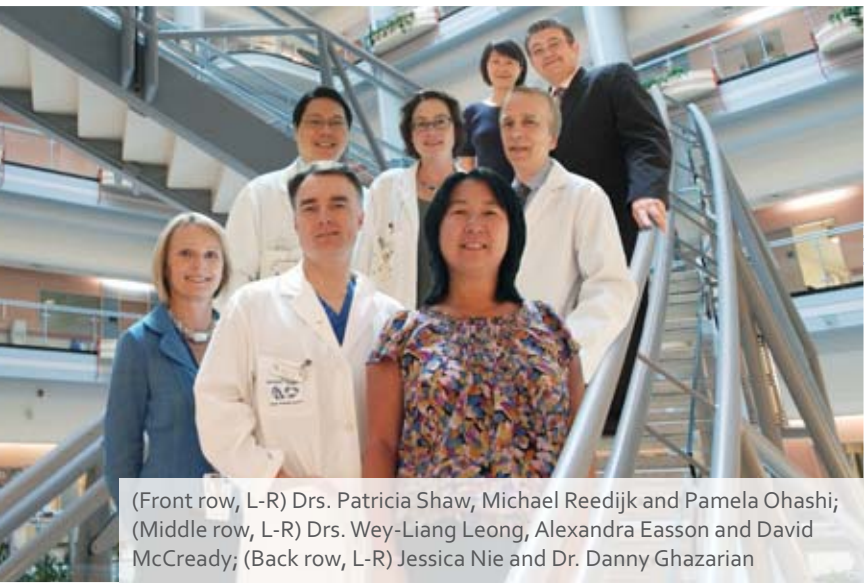
The donation will help establish the Canadian Depression Biomarker Network, a Canada-wide study led by Dr. Sidney Kennedy, UHN's Psychiatrist-in-Chief. The Network will use clinical and molecular data to create personalized predictions about treatment response and to identify and develop new therapeutic targets.

Constructing the Future of Research Innovation at TWH

This past year saw the completion of Phase 1 and 2 demolition as part of the ongoing construction of the Krembil Discovery Centre at TWH. The Centre, whose construction began in 2010, will be a 325,000 square foot facility spanning nine floors, including 150,000 square feet of laboratory space.

The state-of-the-art research space will house world renowned research programs in arthritis and rheumatism, autoimmune diseases, spinal cord injury, stroke, Parkinson's disease, epilepsy, Alzheimer's disease, brain tumours and aneurysms, pain disorders, eye diseases and orthopedics. The Centre is scheduled to open its doors in 2013.

An architectural rendering of the Krembil Discovery Centre



(Front row, L-R) Drs. Patricia Shaw, Michael Reedijk and Pamela Ohashi; (Middle row, L-R) Drs. Wey-Liang Leong, Alexandra Easson and David McCready; (Back row, L-R) Jessica Nie and Dr. Danny Ghazarian

TWRI Captures New Funding from MRI

The Ontario Ministry of Research and Innovation (MRI) has awarded TWRI's Dr. Michael Tymianski $1.4M in new funding from the Ontario Research Fund–Research Excellence Program, Round 5 competition. Financial support for the project "*TRPM7 Inhibitors for the Treatment of Stroke and Myocardial Ischemia*" will be used to develop drugs targeting TRPM7, a protein implicated in the treatment of cellular damage arising from stroke, heart attack and retinal disorders.

Dr. Michael Tymianski

Honour Roll

Selected achievements of UHN Researchers from 2010-2011

Bernard Cummings
MB, ChB, FRCPC

2011 ASTRO Gold Medal,
American Society for Radiation Oncology

Mitsuhiko Ikura
PhD

2010 Robert L. Noble Prize,
Canadian Cancer Society

Eleanor Fish
PhD

2010 Seymour and Vivian Milstein Award for Excellence in Interferon and Cytokine Research,
International Society for Interferon and Cytokine Research

Michael Jewett
MD, FRCSC

2011 Distinguished Contribution Award,
American Urological Association;
2011 Society of Urologic Oncology Medal,
Society of Urologic Oncology

Richard Hill
PhD

2011 Henry S. Kaplan Distinguished Scientist Award,
International Association for Radiation Research

Anthony Lang
MD, FRCPC

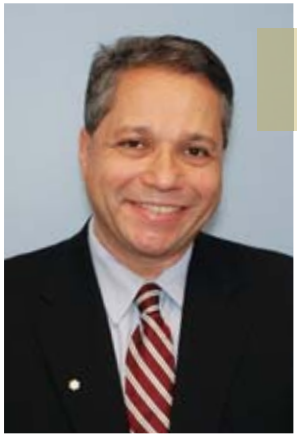
Officer,
Order of Canada;
Fellow,
Royal Society of Canada;
Fellow,
Canadian Academy of Health Sciences

Ren-Ke Li
MD, PhD

Fellow,
Canadian Academy of Health Sciences

Carol-Anne Moulton
MD, FRCSC, PhD

Early Researcher Award,
Ontario Ministry of Research and Innovation



Peter Singer
MD, MPH, FRCPC, FRSC

Officer,
Order of Canada

Charles Tator
MD, PhD, FRCSC, FACS

2011 ASIA Lifetime Achievement Award,
American Spinal Injury Association

Bradly Wouters
BEng, PhD

Klaas Breur Gold Medal Award,
European Society for Therapeutic Radiology and Oncology

Camilla Zimmermann
MD, PhD, FRCPC

2010 William E. Rawls Prize,
Canadian Cancer Society

Raising a Glass to Neuroscience Research

Toronto General & Western Hospital Foundation
Grand Cru Culinary Wine Festival

Early in October 2010, 350 connoisseurs and gourmands joined some of the city's most prominent scientific minds for the 6th Annual *Grand Cru Culinary Wine Festival*, Toronto's premier wine and food event. The event raised $800,000 to support basic research within the Spinal Program at the Krembil Neuroscience Centre, led by Dr. Michael Fehlings, and research infrastructure at TGRI and TWRI.

The Spinal Program provides comprehensive treatment for patients with spinal disorders and spinal cord injury, and accelerates the discovery of novel treatment strategies through innovative research. Its research component is aimed at advancing experimental discoveries through preclinical and clinical trials to bring promising new therapies to individuals with spinal cord injuries. Established in 1994, the program is recognized as a Centre of Excellence in Spinal and Spinal Cord Injury Care by the Christopher and Dana Reeve Foundation.

The 2010 *Grand Cru* event featured local and international culinary talent, including celebrity chefs Mark McEwan and Victor Barry and some of the world's foremost wine producers. The event was hosted in private homes throughout the city. Each chef who participated generously donated their time, preparing sensational tasting menus paired with exceptional wines provided by a number of international wine estates. In addition to Dr. Fehlings, many prominent UHN researchers attended the event including Drs. Michael Tymianski, Andres Lozano, Shaf Keshavjee and Vivek Rao.

Over its first six years, the *Grand Cru Culinary Wine Festival* has raised more than $8.2M for various programs at UHN.

(L-R) Armando Fumanelli (Cantine Marchesi Fumanelli Winery), Cheryl McEwen, Chef Victor Barry (Splendido), Dr. Michael Fehlings, Dr. Shaf Keshavjee and Robert McEwen

"This event continues to age much like a fine wine. Each year we set even more aggressive goals than the year before, in terms of the projects we raise funds for, and each year, we meet them."
- Event Chair & Founder Todd Halpern

Playing Canada's Game for a Cure

(L-R) Scott Morrison, Don Cherry, Peter Goodhand, Paul Alofs and Tyler McGregor

Princess Margaret Hospital Foundation
Road Hockey to Conquer Cancer

The inaugural *Road Hockey to Conquer Cancer* event was held at Ontario Place on October 1, 2011, with more than 1500 players and 200 teams participating, raising over $2.4M for cancer research. The event, hosted by PMHF and the Canadian Cancer Society (CCS), set a world record for a road hockey event fundraiser.

The day began just after sunrise with a stirring opening ceremony that included hockey icon Don Cherry; UHN President and CEO, Dr. Robert Bell; PMHF President and CEO, Paul Alofs; CCS President and CEO, Peter Goodhand; and Executive Producer of Hockey for Rogers Sportsnet, Scott Morrison.

Each of the teams played five games throughout the course of the day and, in between, nursed aching muscles with massages and enjoyed interactive games and live music. More than 70 celebrities played as honourary captains alongside the participants, including former NHLers Jeremy Roenick and Bryan Trottier, figure skating champion Elizabeth Manley, Olympic gold medalists Alexandre Bilodeau and Adam van Koeverden, and a number of musicians and media personalities.

An emotional closing ceremony, led by Steve Merker (PMHF) and James Duthie (TSN), included Dr. Peter Ferguson, head of the Sarcoma Site at PMH, who spoke on behalf of the doctors participating in the ceremony. Tyler McGregor, an elite hockey player before losing his leg to cancer, gave a few final words about why this event was important to him and to all the young men and women who face a diagnosis of cancer.

Research on the Runway

AARC Director Dr. Eleanor Fish modelled shoes at the event

Arthritis Research Foundation
Kick Up Your Heels

In May, UHN's Arthritis Research Foundation held its first annual *Kick Up Your Heels* event, a shoe- and fashion-themed fundraiser to benefit arthritis research at UHN. The occasion attracted over 200 guests to the Koerner Hall at the Royal Conservatory of Music in Toronto for an evening of food and wine tastings, live music and a fashion show.

"*Kick Up Your Heels* was born when we decided to update our annual fashion show event. We wanted to create a unique evening, still attractive to our predominantly female guests, featuring upscale fashion with a twist," explains Arthritis Research Foundation Special Events Coordinator Gillian Williams.

Headlining the evening was a fashion show featuring spring dresses and shoes modelled by local Toronto celebrities and Arthritis & Autoimmunity Research Centre (AARC) researchers, including Director Dr. Eleanor Fish and members Drs. Mark Erwin and Monique Gignac. Other highlights included a wine and shoe pairing, live music from Royal Conservatory artists and a rare wine bottle auction. Attendees included CP24 anchor Farah Nasser, CBC radio host Mary Ito and AARC members Drs. Dafna Gladman and Murray Urowitz.

The evening, now planned as the Arthritis Research Foundation's annual spring fundraising event, proved to be a great success. "Our attendees loved the concept! The inaugural night in the soaring glass lobby of Koerner Hall was an even bigger success than we ever imagined," adds Ms. Williams.

The event raised over $60,000 to help support research into the causes, treatment and cure of arthritis and autoimmune diseases. Explains Arthritis Research Foundation Executive Director Dave Prowten, "This research is critical for finding more ground-breaking and effective solutions for the over 4.5 million Canadians suffering from these debilitating conditions."

RESEARCH

UHN's principal investigators undertake a full spectrum of biomedical research to gain understanding about life to improve health. These five themes represent the research priority areas that will help guide UHN to becoming the Research Hospital of the Future.

Mechanisms of Disease encompasses the basic research that uncovers new knowledge of the underlying foundations of phenomena.

Experimental Therapeutics comprises the clinical research cluster at UHN, which seeks to understand and improve treatment and to develop first-in-human clinical trials.

Medical Technology includes a wide range of health care products that, in one form or another, are used to diagnose, monitor or treat diseases or conditions that affect humans.

Informatics is defined as the science of information collection, processing and engineering of information systems. It studies the structure, behaviour and interactions of systems that store, process, access and communicate information, as well as clinical guidelines and formal medical terminologies in health care systems.

Health Services Research is a multidisciplinary and inter-professional field of inquiry, both basic and applied, that examines the use, cost, quality, accessibility, delivery, organization, financing and outcomes of health care services.

MECHANISMS OF DISEASE

Stem Cells that Control Human Blood Production

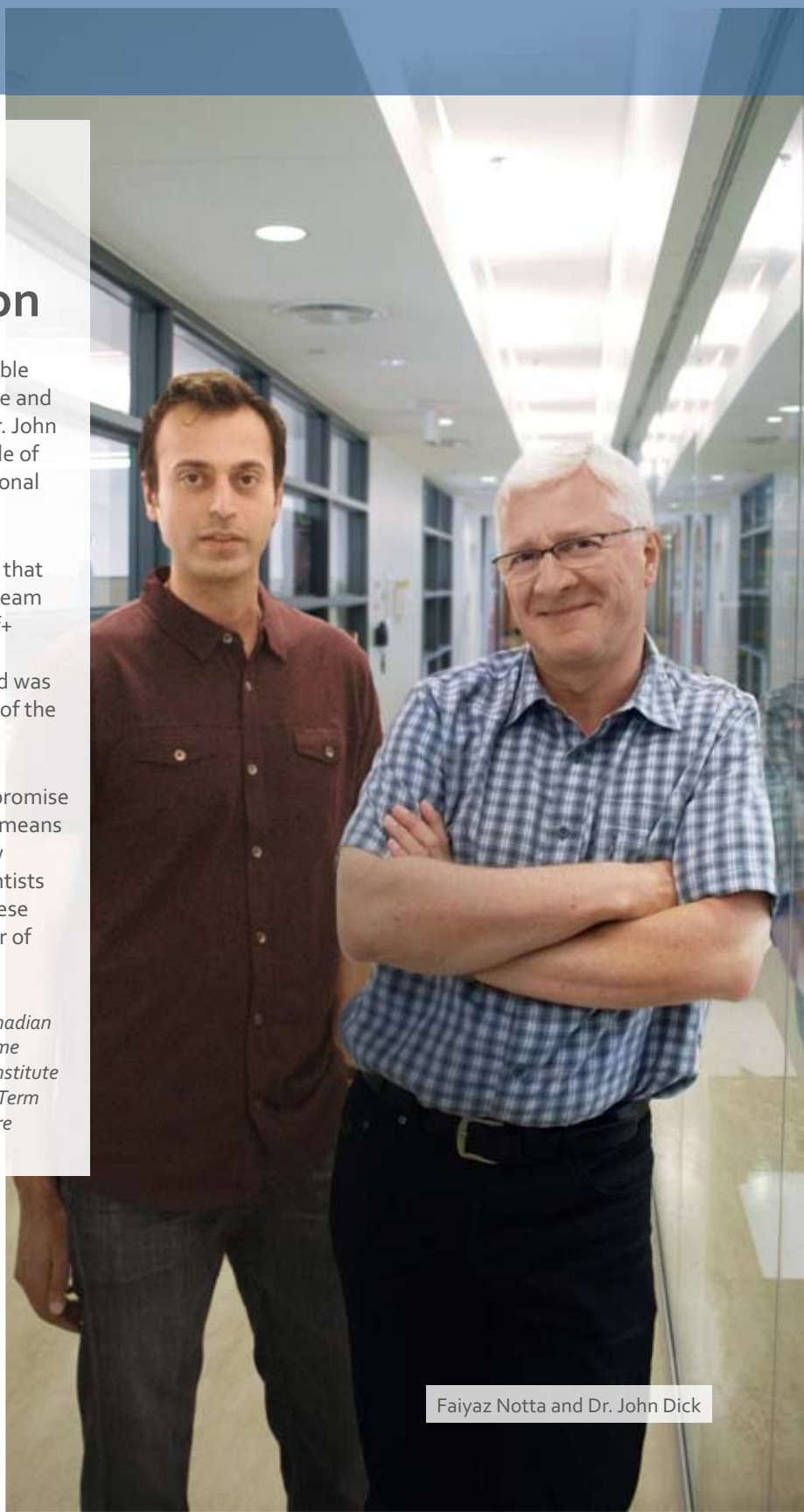
Hematopoietic stem cells (HSCs) are solely responsible for lifelong blood production, but they are very rare and difficult to isolate. Researchers at UHN, led by OCI's Dr. John Dick, identified a method to isolate single HSCs capable of developing into multiple cell types comprising a functional blood system.

Using a technique known as flow cytometry, a process that discriminates cells based on cell surface proteins, the team isolated cells expressing a protein called CD49f (CD49f+ cells). They found that a single CD49f+ cell was able to self-renew, function in the body over the long term and was capable of developing into all the functional cell types of the blood system.

These findings are a major step towards realizing the promise of regenerative medicine for patients. "This discovery means that we have an increasingly detailed road map of how human blood develops," says Dr. Dick. "Stem cell scientists can now start characterizing the core properties of these cells and develop better methods to harness the power of HSCs for clinical transplantation."

Notta F et al. Science. 2011 Jul. Research supported by the Canadian Institutes of Health Research, the Terry Fox Foundation, Genome Canada through the Ontario Genomics Institute, the Ontario Institute for Cancer Research, the Ontario Ministry of Health and Long-Term Care, the Canada Research Chairs Program, the McEwen Centre for Regenerative Medicine and The Princess Margaret Hospital Foundation.

Watch a video of Dr. Dick discussing these findings.



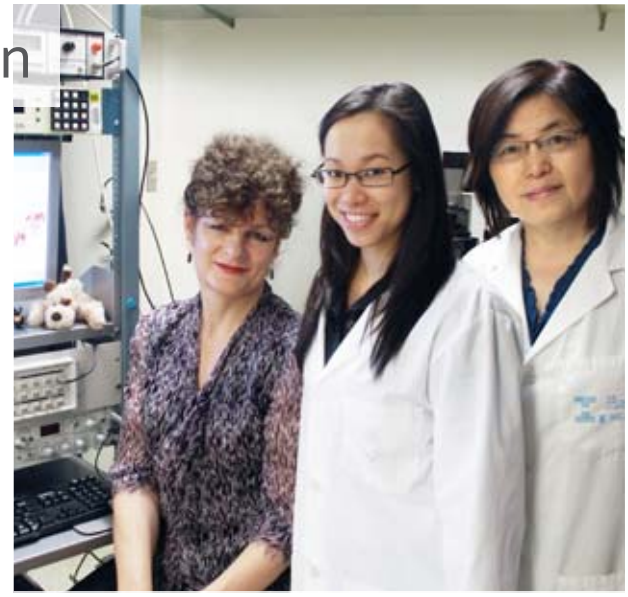
Faiyaz Notta and Dr. John Dick

The Physiology of Synaptic Transmission

Communication between neurons in the brain occurs at synapses by the impulse-triggered release of chemical transmitters at the nerve terminal. Calcium ions (Ca^{2+}) entering through voltage-gated calcium channels (Ca_V) trigger synaptic vesicles (that package transmitters) to fuse and discharge their contents. Curious as to why the Ca_V2 family, with its reported low Ca^{2+} transport capacity, predominates at nerve terminals, the laboratory of TWRI Senior Scientist Dr. Elise Stanley—including trainees Alexander Weber, Fiona Wong, and Adele Tufford; collaborators Drs. Lyanne Schlichter and Victor Matveev; and assisted by technicians Qi Li and Xiaoping Zhu—re-examined the established $Ca_V1 > Ca_V2 > Ca_V3$ hierarchy originally determined with non-physiological conditions.

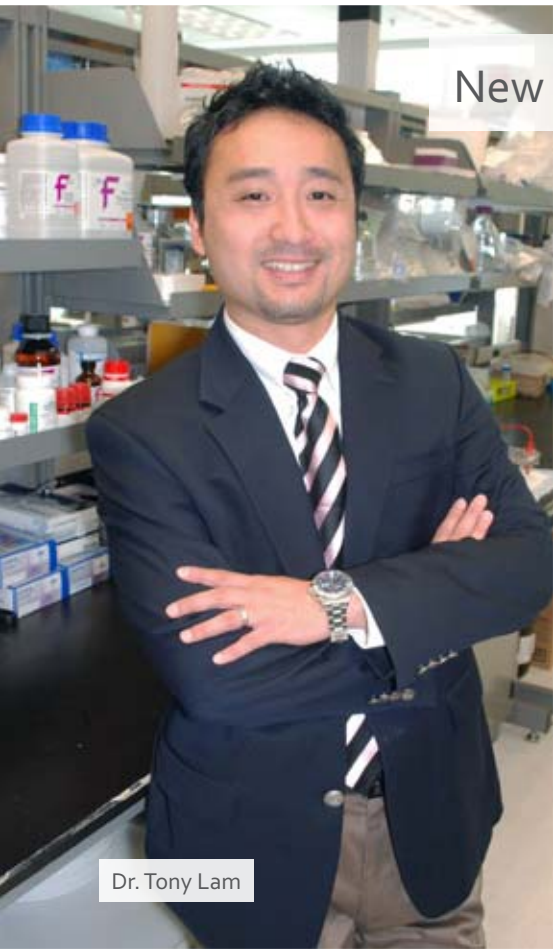
Contrary to 'textbook fact', the results demonstrated a $Ca_V2.2 > Ca_V1 > Ca_V3$ hierarchy and explain the preference for Ca_V2 channels at the nerve terminal. Dr. Stanley explains, "Our results carry weight because a dramatic improvement in recording methods allowed us to measure single calcium channel currents with physiological Ca^{2+} concentrations."

This work also provide support for Dr. Stanley's previous findings that synaptic vesicle fusion can be triggered by a single, nearby calcium channel. Because neurotransmitter release is involved in virtually every aspect of nervous system function, these results have a major impact on the understanding of normal brain processing, as well as a broad variety of nervous system disorders.



Dr. Elise Stanley, Fiona Wong and Qi Li

Weber AM et al. Nat Neurosci. 2010 Nov. Research supported by the Canadian Institutes of Health Research, the Canada Research Chairs Program, the Anne and Max Tanenbaum Chair in Molecular Neuroscience, the Ontario Graduate Scholarship and the National Science Foundation.



Dr. Tony Lam

New Insights into Blood Glucose Regulation

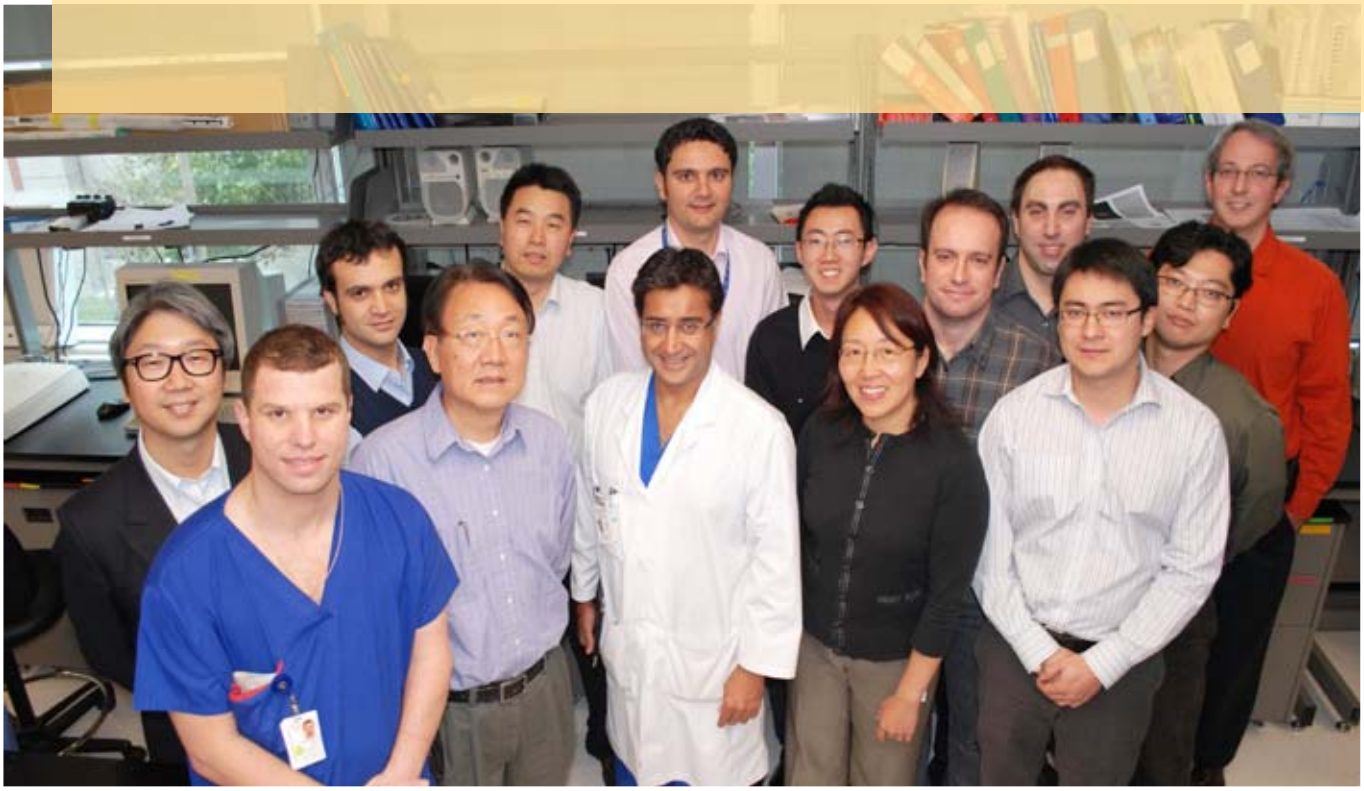
A TGRI study by Dr. Tony Lam and his team revealed new information about nutrient sensing—the ability of cells to recognize and respond to energy substrates like glucose. They examined whether protein kinase C (PKC), an enzyme with many different functions located in the lining of the gut, plays a role in triggering important signals to the brain and liver for maintaining healthy blood glucose levels.

By inhibiting the action of PKC in the duodenum—the first section of the small intestine—the team found that there was a significant increase in blood glucose levels. Conversely, activation of a form of PKC (PCK-δ) in the duodenum led to decreased blood glucose levels. These results indicate that PKC is involved in nutrient sensing in the gut thereby helping to regulate normal blood glucose levels.

Dr. Lam explains, "This reveals a new role for duodenal PKC-δ in glucose regulation and maintaining nutrient balance. We believe that activation of this system in the duodenum could help lower blood glucose levels in diabetes and obesity."

Kokorovic A et al. Gastroenterology. 2011 Jun. Research supported by the Canadian Institutes of Health Research, the Canada Research Chairs Program and the John Kitson McIvor Chair in Diabetes Research.

EXPERIMENTAL THERAPEUTICS



(Front row, L-R) Drs. Marcelo Cypel, Mingyao Liu and Shaf Keshavjee and some members of the Latner Thoracic Laboratories team

A System Developed to Improve Donor Lungs

A TGRI research team has shown in a clinical trial, for the first time, that the Toronto XVIVO Lung Perfusion System can safely and effectively treat, re-assess and improve the function of high-risk donor lungs so that they can be successfully transplanted into patients. This technique could significantly expand the donor organ pool and improve outcomes after transplantation.

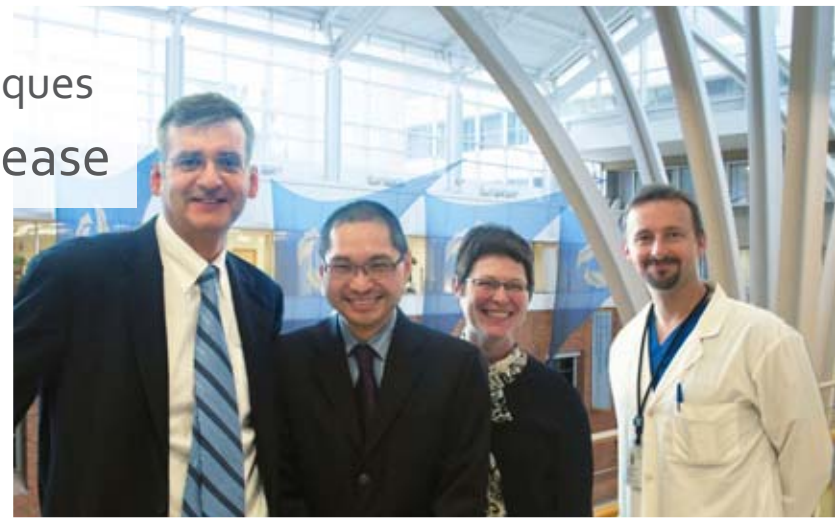
Led by Dr. Shaf Keshavjee, the team found that using high-risk donor lungs, which were improved and re-tested in the Toronto XVIVO System before surgery, led to results comparable to those using conventional donor lungs. "Donor lungs previously thought to be unusable can now be used for transplantation with excellent outcomes. This will provide more lungs with predictable, safer outcomes after transplantation," says Dr. Marcelo Cypel, first author of the study.

"This heralds a new era in transplantation when we can predict how well the organ functions before using it," adds Dr. Keshavjee. "We can help the organ heal itself, and ultimately, we can use the Toronto XVIVO System as a platform to engineer 'super organs' for transplantation."

Cypel M et al. N Engl J Med. 2011 Apr. Research supported by Vitrolife and the McEwen Centre for Regenerative Medicine.

Watch how the XVIVO system works.

Stimulating Treatment Techniques for Alzheimer's Disease



Drs. Andres Lozano, David Tang Wai, Mary Pat McAndrews and Adrian Laxton

A team of researchers at TWRI, led by Dr. Andres Lozano, completed the first multi-patient phase I trial investigating the effects of deep brain stimulation (DBS) for the treatment of patients with mild Alzheimer's disease (AD). DBS involves placing electrodes at specific sites in the brain to deliver continuous stimulation from an implanted generator.

Explains Dr. Lozano, "We have found evidence showing how DBS to a region of the brain known as the fornix may possibly improve memory and/or slow the rate of cognitive decline."

Using state-of-the-art imaging methods, the team found that DBS improved brain activity in areas that were dysfunctional. These effects were maintained for up to a year after the study.

"DBS offers the possibility of modulating brain circuits in an adjustable and reversible fashion," says Dr. Lozano. "The safety and biological effects of the procedure are sufficiently compelling to warrant a phase II clinical trial to better understand if DBS may be a potential therapeutic option for patients with AD."

Laxton AW et al. Ann Neurol. 2010 Aug. Research supported by the Neurosurgical Research and Education Foundation, the Dana Foundation, the Canada Research Chairs Program, the RR Tasker Chair in Stereotactic and Functional Neurosurgery and the Krembil Neuroscience Discovery Fund.

New Surgical Procedure Reverses Loss of Brain Matter

Dr. Michael Tymianski

Researchers at TWRI have initiated the restoration of lost brain tissue through brain bypass surgery in patients where blood flow to the brain is impaired by cerebrovascular disease. This is the first study to demonstrate that a surgical treatment can restore lost brain tissue.

When blood flow is reduced to areas of the brain as a result of diseased blood vessels, there is a progressive loss of tissue through a process known as cortical thinning. Cortical thinning can affect cognitive function, increase risk of stroke and lead to the development of neurodegenerative disorders. The group examined patients who had undergone cranial bypass surgery to restore blood flow and measured changes in cortical volume by magnetic resonance imaging. Eleven months after surgery, a 5.1% increase in cortical thickness was observed in affected areas, reversing the damaging effects of decreased blood flow.

Explains study lead Dr. Michael Tymianski, "The re-growth of brain tissue has only been observed in an extremely limited number of circumstances. These findings are important because one of the most prevalent health issues facing our population is chronic cerebrovascular disease."

Fierstra J et al. Stroke. 2011 Apr. Research supported by the Chair Fund of UHN's Neurovascular Therapeutics Program and the Ontario Research Fund Brain Consortium Grant.

(L-R) Alisha Elford, Dr. Kiichi Murakami, Michael Pniak, Jessica Nie and Dr. Pamela Ohashi

Using T Cells to Combat Cancer

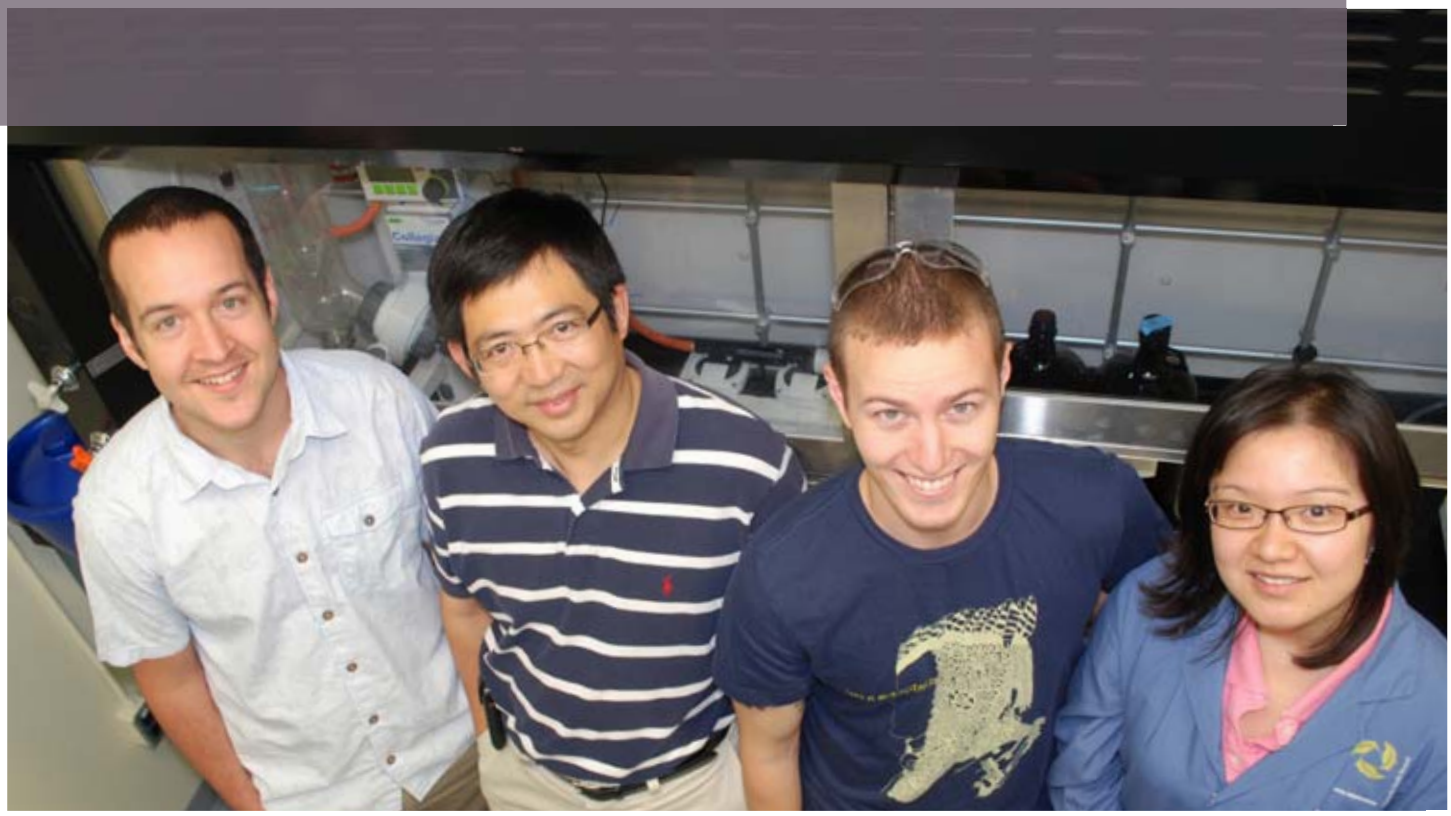
T cells are cells of the immune system that specifically recognize and target foreign particles in the body. While they have been found within tumours of cancer patients, T cells are unable to mount a sufficient immune response to prevent tumour growth and progression. Recent efforts have been aimed at one type of immune therapy called adoptive T cell therapy, which involves extracting the T cells found in the tumour (tumour infiltrating lymphocytes, TILs) and expanding the population of these cells before re-infusing them back into the patient. Studies performed in the United States and Israel have found that this approach has benefits for patients with metastatic melanoma.

OCI Senior Scientist Dr. Pamela Ohashi has published a study laying the groundwork for developing clinical trials using TILs in Canada. Using 40 tissue samples derived from melanoma patients, her team developed a robust protocol to isolate and expand TILs. The cells were grown to amounts required for therapeutic administration and were effective in their ability to kill cancerous cells.

"We are the first group in Canada to establish this expertise. The design of clinical protocols using TILs at our institution is currently underway," says Dr. Ohashi. "We've assembled a team including surgeons, medical oncologists and pathologists to advance immune therapy at UHN."

Nguyen LT et al. PLoS One. 2010 Nov. Research supported by the Campbell Family Institute for Breast Cancer Research, the Canadian Breast Cancer Research Alliance, the Ontario Institute for Cancer Research, the Canada Research Chairs Program and The Princess Margaret Hospital Foundation.

MEDICAL TECHNOLOGY



(L-R) Jon Lovell, Dr. Gang Zheng, Thomas MacDonald and Cheng Jin

Organic Nanoparticles
for Targeting and Treating Cancer

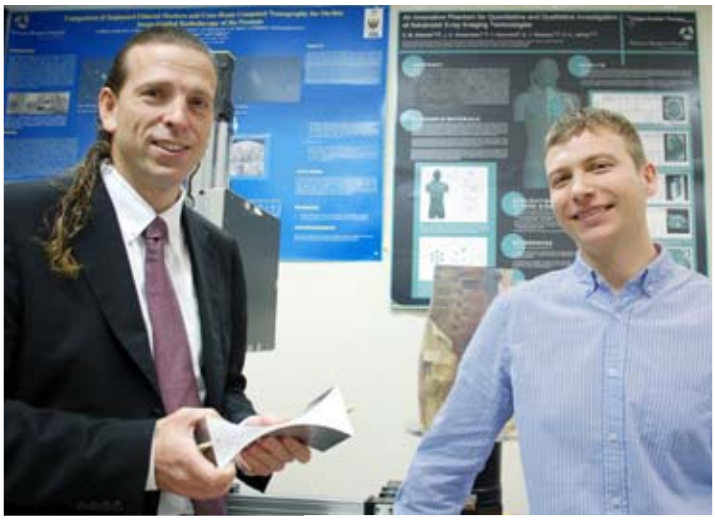
An OCI team, led by Dr. Gang Zheng, has created an organic, nontoxic and biodegradable nanoparticle—a minute molecule with novel properties—that uses light and heat to deliver drugs and treat cancer.

Dr. Zheng's team combined two naturally occurring molecules (chlorophyll and lipids) to create a unique nanoparticle that targets tumour cells and absorbs light. The group then used a laser to rapidly heat the nanoparticles to a temperature of 60°C, destroying the tumour. The nanoparticle can also be used for photoacoustic imaging—combining light and sound to produce a high-resolution image to help find and target tumours.

"This new nanoparticle has a simple structure, versatile function and unprecedented safety," explains Dr. Zheng. "There are many nanoparticles out there but this one is the complete package for various types of cancer imaging and treatment options previously unavailable. We are excited by the possibilities for its use in the clinic."

Lovell JF et al. Nat Mater. 2011 Mar. Research supported by the Ontario Institute for Cancer Research, the Canadian Cancer Society, the Natural Sciences and Engineering Research Council, the Canadian Institutes of Health Research, the Joey and Toby Tanenbaum/Brazilian Ball Chair in Prostate Cancer Research, the Campbell Family Institute for Cancer Research, the Ontario Ministry of Health and Long-Term Care and The Princess Margaret Hospital Foundation.

Making CT Scanning Safer for Patient Use



Dr. David Jaffray and Steven Bartolac

Recent findings from OCI's Dr. David Jaffray and his team demonstrate the utility of a new approach that could make computed tomography (CT) scanning safer for patients. CT technologies are routinely used for medical diagnostics and image guidance for interventional procedures. Advances have led to faster scanning and better image quality resulting in its more frequent use in the clinic. However, the increased use of CT scanning has raised concern regarding the associated radiation exposure delivered to patients.

CT scanning produces a single three-dimensional image from a series of two-dimensional x-ray images (radiographs) taken at various perspectives about a patient. The team tested a proposed approach, called fluence field modulated CT (FFMCT), that modifies how the x-ray beam is delivered during scanning. The study showed that FFMCT could potentially deliver quality images of target areas of interest with radiation dose reductions ranging from 39-52%.

"This approach manages the tradeoff between image quality and dose most effectively," states Dr. Jaffray. "FFMCT could have a positive impact on the utility and safety of CT examinations."

Bartolac S et al. Med Phys. 2011 Jul. Research supported by the Ontario Graduate Scholarship Program and The Princess Margaret Hospital Foundation.

Using Smartphones in Hospitals

Efficient communication between health care workers is critical for providing quality health care to patients. While the traditional means of communication rely on the use of a pager, the popularity of smartphones has led TGRI's Drs. Dante Morra and Robert Wu to critically examine their use.

Residents, nurses, allied health professionals and attending physicians were given Blackberry smartphones. Researchers measured the frequency and type of communication between members of the medical units. Urgent issues were communicated through phone calls, while emails were used to relay non-urgent messages. The study identified positive and negative consequences of smartphone use for clinical communication. There was an apparent improvement in efficiency over the use of pagers, with increased mobility and multi-tasking for residents and physicians. Negative outcomes included unprofessional smartphone use and differences regarding what was considered urgent.

(L-R) Dr. Peter Rossos, Dr. Robert Wu, Sherman Quan, Vivian Lo and Dr. Dante Morra

Commenting on these findings, Dr. Morra says, "Smartphone use by doctors in the hospital appeared to improve efficiency of communication. While negative impacts were observed, we can begin developing systems to balance these and enhance health care through improved communication strategies."

Wu R et al. J Med Internet Res. 2011 Aug. Research supported by the Ontario Ministry of Health and Long-Term Care.

INFORMATICS

Gene Signature Helps Predict the Benefit of Chemotherapy

Recent findings from OCI/PMH provide important new information that may help guide appropriate post-operative treatment for patients with early-stage (I and II) non-small-cell lung cancer (NSCLC). The research team, led by Drs. Ming-Sound Tsao and Frances Shepherd in collaboration with the NCIC Clinical Trials Group (CTG) in Kingston, conducted an in-depth analysis of gene expression from over 130 frozen tumour samples to determine if this pattern, or 'signature', of gene expression could help identify patients as high- or low-risk for cancer recurrence.

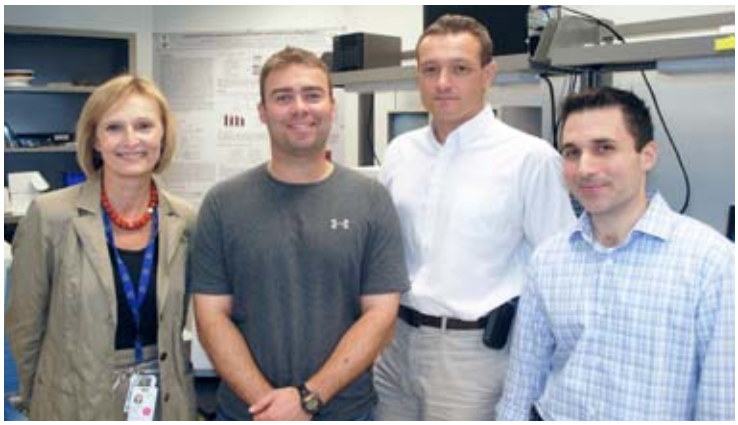
The researchers performed genomic analysis of lung tumour samples collected from Canadian patients participating in the NCIC CTG-led clinical trial, who did not receive chemotherapy after surgery. A set of 15 genes was identified that predicted which patients had aggressive cancers with a high risk of recurrence and death and which had less aggressive disease and a low risk of recurrence. The genetic signature was then applied to the group of patients who received post-operative chemotherapy. The results showed that patients identified as high-risk by the signature had improved survival and derived significant benefit from chemotherapy.

"This study shows that the 15 genes identified may help categorize patients with stage I and II cancer who may benefit from post-operative chemotherapy and help other patients avoid potentially harmful treatment," explains Dr. Tsao. "Importantly, these findings will help us move one step closer to personalized medicine for patients."

Zhu CQ et al. J Clin Oncol. 2010 Oct. Research supported by the Canadian Cancer Society, the US National Cancer Institute, the Canada Foundation for Innovation, the Canada Research Chairs Program, the Scott Taylor Chair in Lung Cancer Research, the Ontario Ministry of Health and Long-Term Care, GlaxoSmithKline and The Princess Margaret Hospital Foundation.

Drs. Frances Shepherd and Ming-Sound Tsao

Informatics-based Strategies to Identify Ovarian Cancer



(L-R) Drs. Patricia Shaw, Thomas Kislinger, Igor Jurisica and Blaise Clarke

Epithelial ovarian cancer (EOC) is one of the most common types of cancer in women worldwide. Due to the lack of a reliable early detection method, most cases of EOC are reported in the late stages of disease progression, with tumours having spread beyond the ovaries.

Research from OCI Scientist Dr. Thomas Kislinger is focused on discovering reliable biomarkers—indicators of disease states—that will lead to early detection and more efficient, individualized treatment regimens. Dr. Kislinger analyzed proteins in ascitic fluids—cellular fluids leaked into the spaces adjacent to a tissue of interest—as they were likely to be enriched with candidate biomarkers.

Using a technique called 'shotgun proteomics', where proteins are broken down into smaller components and then simultaneously separated and identified, a comprehensive description of the proteins within the ascites was formed. Ascitic samples from patients with malignant tumours were compared to benign tumour samples to identify unique biomarkers related to malignancy. Comparison of this data with existing data sets led to a prioritized list of 51 proteins for further investigation. Dr. Kislinger's research provides a useful template for future proteomics-based discoveries of cancer biomarkers.

Elschenbroich S et al. J Proteome Res. 2011 May. Research supported by the Canadian Institutes of Health Research, the Canada Foundation for Innovation, the Ministry of Research & Innovation Ontario Research Fund, the Ontario Ministry of Health and Long-Term Care, the Ontario Institute for Cancer Research, the Canada Research Chairs Program and The Princess Margaret Hospital Foundation.

New Standards of Diagnosis for Renal Dysfunction

Liver cirrhosis, a condition from many causes that results in scarring of the liver, can lead to kidney malfunction. The most severe form is called hepatorenal syndrome (HRS), often associated with a fatal outcome. While current clinical practice limits drug treatment to patients with HRS, those with milder kidney dysfunction could also benefit from treatment. However, there are no defined criteria to proceed with this broadened approach.

To overcome this issue, a group of experts in the field of renal dysfunction in cirrhosis, led by TGRI Affiliate Scientist Dr. Florence Wong, was formed to assess and outline new standards for the diagnosis of kidney malfunction in patients with cirrhosis. The participating experts compiled information from previously published studies and developed new guidelines to offer earlier and more effective intervention strategies.

The group proposed the use of the term "hepatorenal disorders" to describe all concurrent kidney dysfunction in patients with advanced liver disease. Explains Dr. Wong, "These broadened definitions will help design studies to assess the pathophysiology and devise treatment strategies for these patients, who can now be treated earlier, with the potential for improved outcome and survival."

Wong F et al. Gut. 2011 May. Research supported by Ikaria, Gambro Renal Care, Otsuka Pharmaceutical, Nx-Stage Medical, IV League Inc. and Baxter Inc.

Martha Orgill and Dr. Florence Wong

HEALTH SERVICES RESEARCH

Dr. Sherry Grace

Optimizing Referral Strategies for Improved Cardiac Rehabilitation

Cardiovascular rehabilitation, a combination of exercise and lifestyle counselling for diet and medication adherence, reduces the risk of a repeat cardiac event and mortality in patients suffering from cardiovascular disease; however, patient referral and utilization remain low. A study from TGRI Scientist Dr. Sherry Grace has determined the optimal strategy for maximizing enrollment in cardiac rehabilitation programs.

Four different referral strategies were examined: a standard referral protocol; automatic referral, using standard orders or electronic patient records before hospital discharge; liaison referral, facilitated through a personal discussion with a health care professional; and a combined approach, using both systematic and liaison strategies. The study found that the most effective strategy was the combined referral approach, resulting in an 85.8% referral and 73.5% enrollment rate. These numbers were significantly higher than the standard protocol rates of 32.2% referral and 29.0% enrollment.

Comments Dr. Grace, "Wider adoption of the strategies examined in this study would increase enrollment in cardiac rehabilitation programs by up to 45%, providing major public health gains."

Grace SL et al. Arch Intern Med. 2011 Feb. Research supported by the Canadian Institutes of Health Research's Institute of Gender and Health and the Heart and Stroke Foundation of Canada.

Long-Term Health after Severe Lung Injury and Critical Illness

(L-R) Dr. Angela Cheung, Andrea Matté, Dr. George Tomlinson, Dr. Margaret Herridge and Catherine Tansey

Acute Respiratory Distress Syndrome (ARDS) is severe inflammation of the lung that occurs most commonly in response to serious infection and requires ventilator support and admission to the intensive care unit (ICU). Few follow-up studies exist that gauge the impact of ARDS on the long-term health of survivors, their families, and their subsequent health care use and associated costs.

Work by TGRI's Drs. Margaret Herridge, Angela Cheung and collaborators revealed for the first time that for survivors of ARDS, disabilities can continue for up to five years after their critical illness. This is a follow-up of their initial one-year ARDS outcomes study. Patients who were free of other serious illnesses and employed before developing ARDS were often unable to return to work or maintain the same work schedule, had reduced physical health and showed signs of psychological trauma and emotional dysfunction, while incurring costs associated with health care that were comparable to people living with chronic disease.

These findings highlight the need for a new approach in treating these patients—one that considers the long-term impact of acute ICU treatments and rehabilitation both during and after their ICU stay.

Herridge MS et al. N Engl J Med. 2011 Apr. Research supported by the Canadian Intensive Care Foundation, the Physicians' Services Incorporated Foundation and the Ontario Thoracic Society.

The Importance of Mental Well-Being in Health Outcomes

Total joint replacement (TJR) can provide significant pain relief and improved function in patients with osteoarthritis, a very common joint disorder. A recent study by TWRI Senior Scientist Dr. Elizabeth Badley, designed and completed by UHN Arthritis Program epidemiologist Dr. Anthony Perruccio and Senior Scientist Dr. Aileen Davis, has examined the role of mental well-being, physical and social health and self-rated health (SRH) as indicators of future health in patients undergoing TJR.

(L-R) Drs. Aileen Davis, Anthony Perruccio and Elizabeth Badley

Patients were assessed before surgery and three and six months after surgery using questionnaires measuring SRH and factors of physical, social and mental health. Those who recorded a low SRH score before their operation were found to have less improvement in outcomes post-surgery. Furthermore, the study indicated that assessment of mental well-being served as an important predictor of SRH.

These findings highlight the equal importance of SRH, mental well-being and physical health as essential factors contributing to the health status of patients recovering from TJR. "Focusing on only one health aspect, such as pain, may lead to missed opportunities for improving outcomes after surgery. The findings from this study suggest that we need to pay more attention to overall health and mental well-being," comments Dr. Perruccio.

Perruccio AV et al. Arthritis Care Res. 2011 Jul. Research supported by the Canadian Institutes of Health Research.

INSTITUTES

UHN Research is organized on a multi-institute model. Each hospital has an affiliated research institute. Institutes have separate governance structures but all are under the direction of UHN's Vice President, Research. The following pages describe our Institutes.

Ontario Cancer Institute

Toronto General Research Institute

Toronto Western Research Institute

Ontario Cancer Institute

Senior Scientists

Arrowsmith, Cheryl
Asa, Sylvia
Barber, Dwayne
Boyd, Norman
Bristow, Robert
Chakrabartty, Avijit
Devins, Gerald
Dick, John
Ezzat, Shereen
Gagliese, Lucia
Gallie, Brenda
Hakem, Razqallah
Hedley, David
Hill, Richard
Hunt, John
Ikura, Mitsuhiko
Iscove, Norman
Jaffray, David
Jurisica, Igor
Kamel-Reid, Suzanne
Keller, Gordon
Khokha, Rama
Lilge, Lothar
Liu, Fei-Fei
Mak, Tak
Manoukian, Armen
Medin, Jeffrey
Messner, Hans
Minden, Mark
Minkin, Salomon
Muthuswamy, Senthil
Neel, Benjamin
Ohashi, Pamela
Okada, Hitoshi
Pai, Emil
Paige, Christopher
Penn, Linda
Privé, Gilbert
Rodin, Gary
Rottapel, Robert
Schimmer, Aaron
Tannock, Ian
Till, James
Tsao, Ming-Sound
Vitkin, I Alex
Wilson, Brian
Wouters, Bradly
Zheng, Gang

Scientists

Ailles, Laurie
Brock, Kristy
Cheung, Peter
Edelstein, Kim
Hirano, Naoto
Howell, Doris
Kislinger, Thomas
Koch, Anne
Liu, Geoffrey
Moghal, Nadeem
O'Brien, Catherine
Raught, Brian
Stambolic, Vuk
Tiedemann, Rodger
Tillier, Elisabeth
Trudel, Suzanne
Zimmermann, Camilla

Affiliate Scientists

Bradley, Grace
Chen, Eric
Esplen, Mary Jane
Gauthier, Mona
Martin, Lisa
Moore, Malcolm
Moran, Michael
Reedijk, Michael
Ritvo, Paul
Sherar, Michael
Wang, Jean
Xu, Wei

Assistant Scientists

Araki, Toshiyuki
Dacosta, Ralph
Hao, Zhenyue

Clinical Resource Unit (CRU) Members

Baker, Michael
Banerjee, Subrata
Barth, David
Bayley, Andrew
Bedard, Philippe
Bell, Robert
Berman, Hal
Bernardini, Marcus
Bernstein, Lori
Bernstein, Mark
Bezjak, Andrea
Blackstein, Martin
Boerner, Scott
Brade, Anthony
Brandwein, Joseph
Brien, William
Brierley, James
Brown, Dale
Bryson, John
Burkes, Ronald
Catton, Charles
Catton, Pamela
Chan, Kelvin
Chang, Hong
Chen, Christine
Cheung, Carol
Cho, Charles
Cho, John
Chung, Caroline
Chung, Peter
Cil, Tulin
Clarke, Blaise
Cleary, Sean
Croul, Sidney
Crump, R Michael
Cserti, Christine
Cummings, Bernard
Czarnota, Gregory
D'Agostino, Norma
Darling, Gail
Dawson, Laura
de Perrot, Marc
Dinniwell, Robert
Dodge, Jason
Done, Susan
Easson, Alexandra
Elantholi Parameswaran, Saibishkumar
Elliott, Mary
Elser, Christine
El-Zimaity, Hala
Escallon, Jaime
Evans, Andrew
Feld, Ronald
Fenkell, Louis
Ferguson, Peter
Ferguson, Sarah
Finelli, Antonio
Fleshner, Neil
Freeman, Jeremy
Fyles, Anthony
Gaind, Sonu
Gallinger, Steven
Geddie, William
Gentili, Fred
Ghazarian, Danny
Gilbert, Ralph
Gladdy, Rebecca
Goldstein, David
Goodwin, Pamela
Gospodarowicz, Mary
Grant, David
Greig, Paul
Gryfe, Robert
Guha, Abhijit
Gullane, Patrick
Gupta, Abha
Gupta, Vikas
Hales, Sarah
Hodgson, David
Hofer, Stefan
Hogg, David
Hope, Andrew
Irish, Jonathan
Jewett, Michael
Jones, Jennifer
Joshua, Anthony
Kassam, Zahra
Kaya, Ebru
Keating, Armand
Kennedy, Erin
Keshavjee, Shaf
Kiehl, Tim-Rasmus
Kim, Dennis
Kim, John
Knox, Jennifer
Krzyzanowska, Monika
Kukreti, Vishal
Kuruvilla, John
Laframboise, Stephane
Laperriere, Normand
Leighl, Natasha
Leong, Wey-Liang
Levin, Wildred
Li, Madeline
Lindsay, Patricia
Lipton, Jeffrey
Lo, Christopher
Mackay, Helen
Mak, Ernie
Manchul, Lee
Mason, Warren
Matthew, Andrew
McCart, J Andrea
McCready, David
McGilvray, Ian
McLean, Linda
McLean, Michael
McLeod, Robin
Melnyk, Tatiana
Ménard, Cynthia
Millar, Barbara-Ann
Miller, Kim
Miller, Naomi
Milosevic, Michael
Moulton, Carol-Anne
Murphy, K Joan
Olivieri, Nancy
O'Sullivan, Brian
Oza, Amit
Payne, David
Pendergrast, Jacob
Perez-Ordonez, Bayardo
Pierre, Andrew
Rasty, Golnar
Reece, Donna
Ridley, Julia
Ringash, G Jolie
Rosen, Barry
Rotstein, Lorne
Rouzbahman, Marjan
Ruschin, Mark
Sahgal, Arjun
Santos, Gilda
Schuh, Andre
Seccareccia, Dori
Serra, Stefano
Shaw, Patricia
Shepherd, Frances
Simpson, E Rand
Siu, Lillian
Sridhar, Srikala
Strevel, Elizabeth
Sun, Alexander
Sutherland, D Robert
Swallow, Carol
Sweet, Joan
Taremi, Mojgan
Taylor, Bryce
Torlakovic, Emina
Trachtenberg, John
Tsang, Richard
Tsao, May
van der Kwast, Theodorus
Waddell, Thomas
Waldron, John
Ward, Richard
Warde, Padraig
Warr, David
Wei, Alice
Weinreb, Ilan
Wells, Woodrow
Witterick, Ian
Wong, Rebecca
Wood, Robert
Wunder, Jay
Yasufuku, Kazuhiro
Yee, Karen
Yeo, Erik
Youngson, Bruce
Zadeh, Gelareh
Zhong, Toni
Zlotta, Alexandre

Research Space
373,000 square feet

Total External Funding
$101,502,000

872	Publications
48	Senior Scientists
17	Scientists
12	Affiliate Scientists
3	Assistant Scientists
182	CRU Members
262	Total Researchers
190	Fellows
191	Graduate Students
381	Total Trainees
684	Total Staff

Research Council on Oncology (RCO)

Director, OCI; Chair, RCO; Director, Executive Committee
Benjamin Neel

Executive Committee Members
Mitsuhiko Ikura
Senthil Muthuswamy
Pamela Ohashi
Linda Penn
Gary Rodin
Robert Rottapel
Brian Wilson
Bradly Wouters

Clinical Representative, Pathology
Sylvia Asa

Clinical Representative, Radiation Oncology
Mary Gospodarowicz

Clinical Representative, Medical Oncology and Hematology
Malcolm Moore

Clinical Representative, Surgical Oncology
Jonathan Irish

CCRU Representative
Amit Oza

Vice President, PMH
Sarah Downey

Executive Director, Research Operations
Lisa Alcia

Vice President, Research
Christopher Paige

Toronto General Research Institute

Behavioural Sciences & Health

Senior Scientists

Flint, Alastair
Kaplan, Allan
Olmsted, Marion
Rodin, Gary
Stewart, Donna

Scientists

Carter, Jacqueline
Esplen, Mary Jane
Grace, Sherry

Affiliate Scientists

Baker, Brian
Carnahan, Heather
Colton, Patricia
Davis, Caroline
Gucciardi, Enza
Hall, Peter
Heslegrave, Ron
Hodges, Brian
Irvine, M Jane
Jones, Jennifer
Katz, Joel
Kovacs, Adrienne
McVey, Gail
Nolan, Robert
Styra, Rima
Woodside, D Blake

Cellular & Molecular Biology

Senior Scientists

Backx, Peter
Berger, Stuart
Cardella, Carl
Cattral, Mark
Cybulsky, Myron
Dick, John
Fantus, I George
Fish, Eleanor
Gorczynski, Reginald
Gotlieb, Avrum
Grant, David
Husain, Mansoor
Levy, Gary
Liles, W Conrad
Liu, Mingyao
Rubin, Barry
Waddell, Thomas
Wheeler, Michael
Zacksenhaus, Eldad
Zhang, Li

Scientists

Dunn, Shannon
Fish, Jason
Kotra, Lakshmi
Lam, Tony
Lee, Douglas
Volchuk, Allen

Affiliate Scientists

Belsham, Denise
Branch, Donald
Chang, Hong
Chow, Chung-Wai
Clark, David
Cole, Edward
Feld, Jordan
Ghanekar, Anand
Gramolini, Anthony
Husain, Shahid
Jin, Tianru
Lee, Ping
Phillips, James
Rocheleau, Jonathan
Rotstein, Coleman
Selzner, Markus

Assistant Scientist

Serghides, Lena

Clinical Decision-Making & Health Care

Senior Scientists

Bombardier, Claire
Cheung, Angela
Daar, Abdallah
Eysenbach, Gunther
Jadad, Alejandro
Krahn, Murray
Naglie, I Gary
Singer, Peter

Scientists

Alibhai, Shabbir
Urbach, David

Affiliate Scientists

Gagliardi, Anna
Kennedy, Erin
Lok, Charmaine
Tomlinson, George
Wei, Alice

Clinical Studies Resource Centre (CSRC) Members

Jewett, Michael
Kapral, Moira
Singer, Lianne

Clinical Investigation & Human Physiology

Senior Scientists

Allard, Johane
Bradley, T Douglas
Cattran, Daniel
Easty, Anthony
Fisher, Joseph
Floras, John
Kucharczyk, Walter
Lewis, Gary
Miller, Judith
Olivieri, Nancy
Walmsley, Sharon

Scientist

Karkouti, Keyvan

Affiliate Scientists

McGowan, Cheri
Perkins, Bruce
Raboud, Janet
Reilly, Raymond
Sawka, Anna
Wong, Florence

Clinical Studies Resource Centre (CSRC) Members

Bril, Vera
Cameron, Douglas
Chan, Charles
Chan, Christopher
Chauhan, Vijay
Cooper, Richard
Djaiani, George
Fedorko, Ludwik
Harris, Louise
Herridge, M Margaret
Ing, Douglas
Jassal, S Vanita
Karski, Jacek
McCluskey, Stuart
McRae, Karen
Parker, John
Salit, Irving
Seidelin, Peter
Sherman, Morris
Siu, Samuel
Slinger, Peter

Experimental Therapeutics

Senior Scientists

Keating, Armand
Kelvin, David
Keshavjee, Shaf
Li, Ren-Ke
Lindsay, Thomas
Liu, Peter
Rao, Vivek
von Harsdorf, Rüdiger
Weisel, Richard

Scientists

de Perrot, Marc
McCart, J Andrea
McGilvray, Ian
Nanthakumar, Kumaraswamy
Yau, Terrence

Affiliate Scientists

Fremes, Stephen
Hwang, David
Medin, Jeffrey
Radisic, Milica
Ross, Heather
Sefton, Michael
Yasufuku, Kazuhiro

Genomic Medicine

Senior Scientists

Kain, Kevin
MacDonald, Kelly
Pei, York
Siminovitch, Katherine

Scientist

Kaul, Rupert

Affiliate Scientists

Boright, Andrew
Downey, Gregory
Osborne, Lucy

Clinical Studies Resource Centre (CSRC) Members

Bargman, Joanne
Beattie, W Scott
Brister, Stephanie
Colman, Jack
David, Tirone
Dzavik, Vladimir
Fenton, Stanley
Gardam, Michael
Gold, Wayne
Goldszmidt, Eric
Granton, John
Grigoriadis, Sophie
Kachura, John
Kennedy, Sidney
Keystone, Edward
Lilly, Leslie
O'Malley, Martin
Rajan, Dheeraj
Rakowski, Harry
Ralph-Edwards, Anthony
Richardson, Robert
Roberts, Heidi
Ross, John
Straus, Sharon
Sweet, Joan
Wolman, Stephen
Yeo, Erik

Research Space
267,000 square feet

Total External Funding
$59,762,000

765	Publications
57	Senior Scientists
18	Scientists
53	Affiliate Scientists
1	Assistant Scientist
51	CSRC Members
180	Total Researchers
156	Fellows
111	Graduate Students
267	Total Trainees
410	Total Staff

TGRI Research Council

Director, TGRI; Chair, TGRI Research Council
Mansoor Husain

Division Head, Behavioural Sciences & Health
Gary Rodin

Division Head, Clinical Decision-Making & Health Care
Claire Bombardier

Division Head, Cell and Molecular Biology
Eleanor Fish

Division Head (interim), Clinical Investigation and Human Physiology; and Experimental Therapeutics
Richard Weisel

Division Head, Genomic Medicine
Katherine Siminovitch

Department Medical Director, Peter Munk Cardiac Centre
Barry Rubin

Clinical Representative, Medical and Community Care
W Conrad Liles

Clinical Representative, Surgical and Critical Care
Shaf Keshavjee

Clinical Representative, Transplant Unit, Platform Leader
Gary Levy
Ian McGilvray

Standing Guests
Reginald Gorczynski
Tony Lam
Ren-Ke Li
Mingyao Liu
Vivek Rao
Jonathan Rocheleau
Thomas Waddell
Li Zhang

Vice President, TGH
Marnie Escaf

Executive Director, Research Operations
Lisa Alcia

Vice President, Research
Christopher Paige

Toronto Western Research Institute

Brain, Imaging & Behaviour - Systems Neuroscience

Senior Scientists

Brotchie, Jonathan
Chen, Robert
Davis, Karen
Hutchison, William
Lozano, Andres
McAndrews, Mary Pat
Mikulis, David
Sandor, Paul
Strafella, Antonio

Affiliate Scientists

De Nil, Luc
Dostrovsky, Jonathan
Kucharczyk, Walter
Saint-Cyr, Jean

Fundamental Neurobiology

Senior Scientists

Broussard, Dianne
Carlen, Peter
Skinner, Frances
Sugita, Shuzo
Tymianski, Michael

Affiliate Scientists

Gaisano, Herbert
Hassouna, Magdy
Valiante, Taufik
Zhang, Liang

Genetics & Development

Senior Scientists

Barr, Cathy
Bremner, Rod
Eubanks, James
Fehlings, Michael
Inman, Robert
Jongstra, Jan
Schlichter, Lyanne
Stanley, Elise
Tator, Charles
Tsui, Florence
Wither, Joan

Scientist

Monnier, Philippe

Health Care & Outcomes Research

Senior Scientists

Badley, Elizabeth
Cassidy, J David
Davis, Aileen
Fortin, Paul
Gignac, Monique
Gladman, Dafna
Mahomed, Nizar
Urowitz, Murray

Scientist

Côté, Pierre

Affiliate Scientists

Cott, Cheryl
Lineker, Sydney
Martino, Rosemary

Patient Based Clinical Research

Senior Scientists

Diamant, Nicholas
Heathcote, Jenny
Lang, Anthony
Shapiro, Colin

Scientists

Bernstein, Mark
Ferguson, Niall
Tarlo, Susan

Vision Science

Senior Scientists

Flanagan, John
Flannery, John
Sharpe, James
Steinbach, Martin
Trope, Graham
Wong, Agnes

Scientists

Hudson, Christopher
Sivak, Jeremy

Affiliate Scientists

Eizenman, Moshe
Gallie, Brenda
Irving, Elizabeth
Wilkinson, Frances

Clinical Studies Resource Centre (CSRC)

Members

Anastakis, Dimitrios
Bookman, Arthur
Buys, Yvonne
Chan, Vincent
Chapman, Kenneth
Chung, Frances
Davey, J Roderick
del Campo, Jose Martin
Devenyi, Robert
Epstein, Trina
Escallon, Jaime
Etlin, David
Evans, Michael
Farb, Richard
Fung, Ken
Gentili, Fred
Graham, Brent
Hawa, Raed
Iwanochko, R Mark
Lam, Robert
Lam, Wai-Ching
Manninen, Pirjo
Massicotte, Eric
McGuire, Glenn
McIntyre, Roger
Melvin, Kenneth
Miyasaki, Janis
Moro, Elena
Oandasan, Ivy
Ogilvie, Richard
Ogilvie-Harris, Darrell
Panisko, Daniel
Parikh, Sagar
Peng, Philip
Radomski, Sidney
Rampersaud, Yoga Raja
Rootman, David
Rosen, Cheryl
Saltzman-Benaiah, Jennifer
Seyone, Chanth
Silver, Frank
Simons, Martin
Singer, Shaun
Slomovic, Allan
St George-Hyslop, Peter
Stanbrook, Matthew
Stubbs, Barbara
Syed, Khalid
Terbrugge, Karel
Tu, Karen
Tumber, Paul
von Schroeder, Herbert
Wherrett, John
Willinsky, Robert
Wong, David
Wong, Jean
Yu, Eric

TWRI Research Council

Director, TWRI; Chair, TWRI Research Council
Peter St George-Hyslop

Division Head, Health Care & Outcomes Research
Elizabeth Badley

Division Head, Genetics & Development
Rod Bremner

Division Head, Fundamental Neurobiology
Peter Carlen

Division Head, Brain Imaging & Behaviour - Systems Neuroscience
Karen Davis

Division Head, Patient Based Clinical Research
Jenny Heathcote

Division Head, Vision Science
Martin Steinbach

Clinical Representative, Krembil Neuroscience Program
Michael Fehlings

Clinical Representative, Musculoskeletal Program
Nizar Mahomed

Clinical Representative, Musculoskeletal Health & Arthritis Program
Robert Inman

Senior Director, Finance
Peggy McGill

Vice President, TWH
Kathy Sabo

Vice President, Research
Christopher Paige

Research Space
105,000 square feet

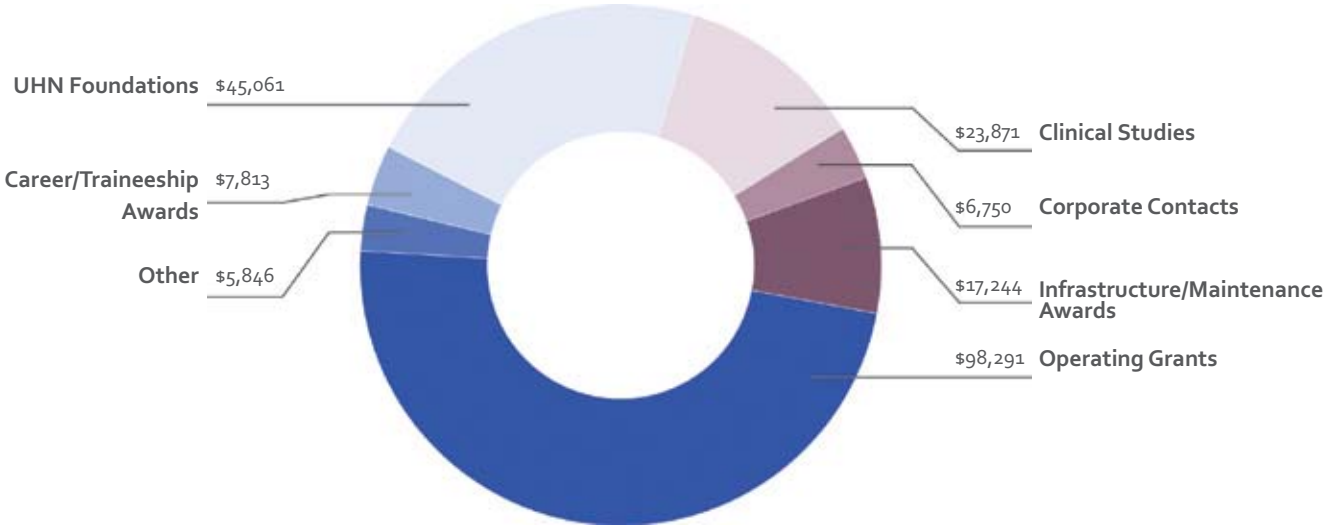
Total External Funding
$43,612,000

515	*Publications*
43	*Senior Scientists*
7	*Scientists*
15	*Affiliate Scientists*
57	*CSRC Members*
122	*Total Researchers*
87	*Fellows*
70	*Graduate Students*
157	*Total Trainees*
206	*Total Staff*

Financial Information

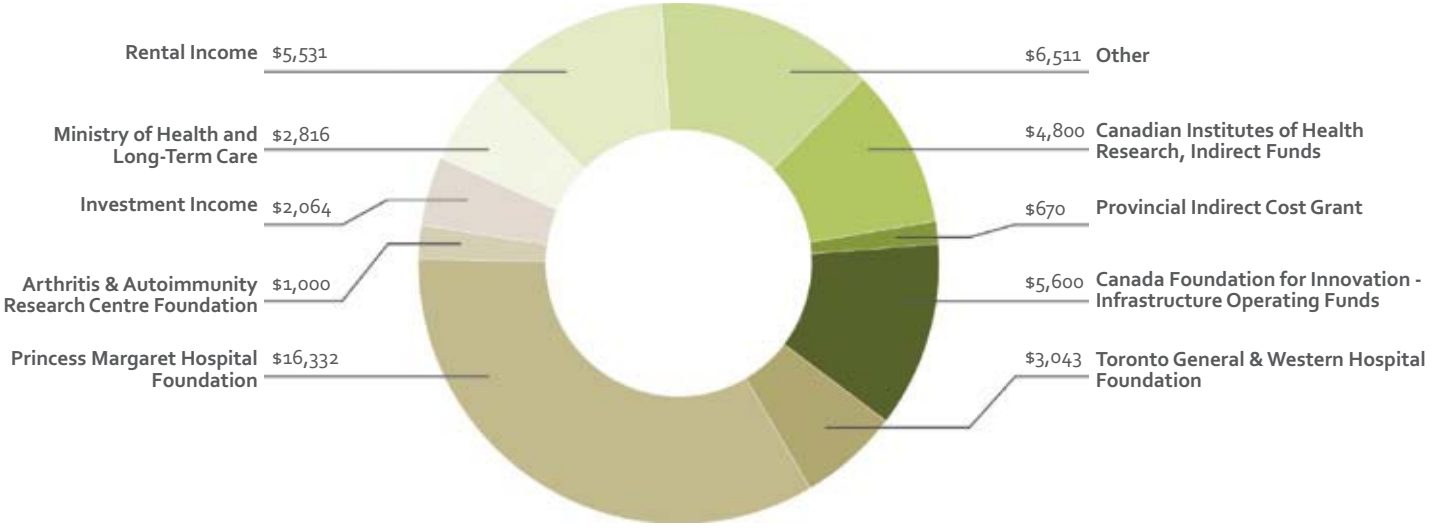
Total Project Funding Awarded (by type, in thousands)

Total $204,876



Research Core/TMDT Operating Funding (in thousands)

Total $48,369



All figures represent fiscal year 2010/11 and include Ontario Cancer Institute (Princess Margaret Hospital), Toronto General Research Institute (Toronto General Hospital), Toronto Western Research Institute (Toronto Western Hospital) and Toronto Medical Discovery Tower (TMDT). Figures may not sum due to rounding. These figures have been provided by UHN Research Financial Services. These figures have not been audited. However, they have been included in the overall UHN statements and have been subjected to audit procedures deemed appropriate by auditors in order to determine their overall reasonableness.

UHN Research Committees

Animal Care Committee (OCI)
Hill, Richard (Co-Chair)
Iscove, Norman (Co-Chair)
Bailey, Monica
Brock, Kristy
Hedley, David
Martin, Lisa
Moloo, Badru
Moriyama, Beryl
Tillier, Elisabeth
Zheng, Gang

Animal Care Committee (TGH, TWH)
Medin, Jeffrey (Chair)
Cybulsky, Myron (Co-Chair)
Cook, Kathleen
Dray, Richard (Community Representative)
Dunn, Shannon
Galligan, Carol
Gorczynski, Reginald
McCart, J Andrea
Moloo, Badru
Monnier, Philippe
Rocheleau, Jonathan
Schlichter, Lyanne
Sugita, Shuzo

Appointments Committee (OCI)
Liu, Fei-Fei (Chair)
Iscove, Norman
Jaffray, David
Khokha, Rama
Mak, Tak
Minden, Mark
Privé, Gilbert
Rodin, Gary
Neel, Benjamin (*ex-officio*)

Cancer Clinical Research Unit Executive
Oza, Amit (Chair)
Brandwein, Joseph
Brierley, James
Degendorfer, Pamela
Fitzgerald, Barbara
Knox, Jennifer
O'Malley, Martin
Reedijk, Michael
Sultan, Roxanna
van der Kwast, Theodorus
Wong, Rebecca
Zimmermann, Camilla

Cancer Clinical Research Unit Management Committee
Degendorfer, Pamela (Chair)
Cheiken, Robin
Cole, Heather
Croft, Sarah
Flynn-Post, Marcia
Hersey, Karen
Molnar, Margaret
Nagai, Jane
Piza Rodriguez, Jesus Giovanni
Purushuttam, Linda
Sauter, Agnes
Sellmann, Susanna
Stewart, Jan

Cancer Registry and Data Access Committee
Brierley, James (Chair)
Dale, Darlene (Co-Chair)
Agelastos, Niki
Easson, Alexandra
Eggert, Calven
Goldstein, David
Gupta, Vikas
Hodgson, David
Krzyzanowska, Monika
Panzarella, Tony
Perez-Ordonez, Bayardo
Shaw, Patricia

Clinical Studies Quality Committee
Paige, Christopher (Chair)
Chan, Charles (Chair)
Alcia, Lisa
Clarke, Rosemarie
Fleshner, Neil
Floras, John
Fox, Susan
Granton, John
Habal, Flavio
Kucharczyk, Walter
Martin, Bella
Matte, Andrea
Musing, Emily
Oza, Amit
Piza Rodriguez, Jesus Giovanni
Roposa, Katie
Siu, Lillian

Data Safety Monitoring Committee
Knox, Jennifer (Co-Chair)
Sun, Alex (Co-Chair)
Cheiken, Robin
Hersey, Karen
Wang, Lisa
Cole, Heather (ex-officio)

Multidisciplinary Research Ethics Board "A"
McRae, Karen (Co-Chair)
Braganza, Sharon
Campbell, Michael
Cathcart, Derek
Cherney, David
Cusimano, Robert
Downar, James
Friedman, Steven
Fung, Scott
Giacobbe, Peter
Lok, Charmaine
Sampson, Heather
Seto, Ronald
Sloss, Elizabeth
Tung, Jennifer
Valiante, Taufik
Virtanen, Carl
Wijeysundera, Duminda
Wolman, Stephen
Zamel, Noe

Multidisciplinary Research Ethics Board "B"
McRae, Karen (Co-Chair)
Anstey, Kyle
Bargman, Carol
Baron, Ruth Anne
Barth, David
Fedorko, Ludwik
Gandhi, Rajiv
Hassouna, Magdy
Hutcheon, Michael
Hutchison, William
Lok, Charmaine
Marras, Connie
McIntyre, Roger
Naraghi, Ali
Parker, John
Rapaport, Lesley
Rivkin, Elena
Sherman, Morris
Wooster, Douglas

Oncology Research Ethics Board "C"

Holland, Jack (Co-Chair)
Amir, Eitan
Brade, Anthony
Buckley, Carol Ann
Chu, Kwun Ye
Darling, Gail
DeLuca, Stephanie
Dio, Jeffrey
Feld, Ronald
Findlay, Andrea
Le, Lisa
Mackay, Helen
Mason, Warren
McLean, Michael
Miller, Naomi
Razak, Albiruni
Robinson, Gordon
Short, Donald
Wei, Alice
Yee, Karen
Zaman, Faraz

Radionuclide Safety Committee

Burke, Ron
Capone, Gina
Chong, Perry
Fountas, Mary
Gabrys, Judith
Green, David
Iscove, Norman
McDermott, Ian
Wilson, David
Bercasio, Vanessa (Administrative Support)
Johnson, Karen-Ann (Guest)
Tourneur, Frank (Guest)

Research Biosafety Committee

Brunton, James (Chair)
Hakem, Razqallah
Lemieux, Camille
Medin, Jeffrey
Shannon, John
Wither, Joan
Bilan, Richard (*ex-officio*)
McDermott, Ian (*ex-officio*)
Moloo, Badru (*ex-officio*)

Research Ethics Board Human Tissue Committee

Cheung, Carol
Henry, Michele
Khokha, Rama
Liu, Geoffrey
Shaw, Patricia
Tsao, Ming-Sound

Ad-Hoc Members:

Asa, Sylvia
Bailey, Denis
Boerner, Scott
Bristow, Robert
Butany, Jagdish
Chetty, Runjan
Croul, Sidney
Crump, Michael
Ezzat, Shereen
Fyles, Anthony
Gallie, Brenda
Ghazarian, Danny
Gilbert, Ralph
Guha, Abhijit
Guindi, Maha
Heathcote, Jenny
Hedley, David
Johnston, Michael
Minden, Mark
Murphy, Janet
O'Sullivan, Brian
Perez-Ordonez, Bayardo
Sweet, Joan
Tkachuk, Douglas
Youngson, Bruce
Yucel, Yeni

Research Risk and Audit Committee

Alcia, Lisa (Chair)
Roposa, Katie (Co-Chair)
Bhardwaj, Renu
Campbell, Chip
Donohue, Evan
Fischer, Gabriella
Goldthorpe, Tom
Goncalves, Tony
MacPherson, Paul
McDermott, Ian
McGill, Peggy
Moloo, Badru
Speers, Vanessa
Vespa, John

TGRI Appointments Committee

Waddell, Thomas (Chair)
Fish, Eleanor
Husain, Mansoor
Liles, W Conrad
Liu, Mingyao
Paige, Christopher
Rodin, Gary
Weisel, Richard
Zhang, Li

TWRI Appointments Committee

Lozano, Andres (Chair)
Badley, Elizabeth
Berger, Stuart
Bremner, Rod
Carlen, Peter
Davis, Karen
Heathcote, Jenny
St George-Hyslop, Peter
Steinbach, Martin

TWRI Space Committee

Eubanks, James (Chair)
Broussard, Dianne
Chen, Robert
Gignac, Monique
McDermott, Ian
Steinbach, Martin
Vidic, Frank
Wither, Joan

TWRI Trainee Affairs Committee

Strafella, Antonio (Chair)
Adleman, Alanna
Alavi, Mahan
Bhardwaj, Renu
Christopher, Leigh
Cockburn, Diane
DeSouza, Danielle
Fan, Susan
Figley, Sarah
Hutchison, William
Jong, Monica
Khuu, Lee-Anne
Kucyi, Aaron
Moayedi, Massieh
Pau, Evelyn
Rosen, Allie
Rozanski, Gabriela
Ruff, Crystal
Skinner, Frances
Srejic, Luka
Tran, Chris
Vetiska, Sandra
Vasudeva, Manoj
Wan, Julie

External Sponsors

Abbott Laboratories
Abiomed
Actelion Pharmaceuticals Canada
ActiViews
Advanced Neuromodulation Systems
Aegera Therapeutics
Alberta Innovates - Health Solutions
Allergan Sales
Alnylam Pharmaceuticals
Alzheimer Society of Canada
Ambit Biosciences
American Association of Neurological Surgeons
American Society of Colon and Rectal Surgeons
American Society of Hematology
American Society of Transplant Surgeons
Amgen Canada
Amicus Therapeutics
Anthera Pharmaceuticals
AOSpine International
APT Pharmaceuticals
Argonne National Laboratory
Arius Research
ArQule
Arthritis and Autoimmunity Research Centre Foundation (Arthritis Research Foundation)
Arthritis Society
ASPEN Rhoads Research Foundation
Association for International Cancer Research
Association of Faculties of Medicine of Canada
Astellas Pharma Canada
AstraZeneca Canada
Atuka
Aviva Canada
Baxter Healthcare
Bayer
Beckman Research Institute of City of Hope
Benvenue Medical
Bill & Melinda Gates Foundation
Biogen Idec
Bioniche Therapeutics
Bio-Rad Laboratories
BioTheryX
Biotronik Canada
Boehringer Ingelheim
Bracco Diagnostic
Brain Tumour Foundation of Canada
Breast Cancer Research Foundation
Bristol-Myers Squibb Canada
Canada Foundation for Innovation
Canada Research Chairs Program
Canadian Anesthesiologists' Society
Canadian Arthritis Network
Canadian Association of Nurses in Oncology
Canadian Association of Radiation Oncology
Canadian Blood Services
Canadian Breast Cancer Foundation
Canadian Breast Cancer Research Alliance
Canadian Cancer Society Research Institute
Canadian Cystic Fibrosis Foundation
Canadian Diabetes Association
Canadian Institutes of Health Research
Canadian Liver Foundation
Canadian Neuromodulation Society
Canadian Partnership Against Cancer
Canadian Patient Safety Institute
Canadian Pulmonary Fibrosis Foundation
Canadian Stroke Network
Canadian Urologic Oncology Group
CanBas
Cancer Care Ontario
Cancer Research Society
Cardiokine
CareFusion
Celgene
Celsion
Centre for Addiction and Mental Health
Centers for Disease Control and Prevention
Cephalon
Cervical Spine Research Society
ChemGenex Pharmaceuticals
Christopher and Dana Reeve Foundation
Chroma Therapeutics
CIHR Canadian HIV Trials Network
Colon Cancer Canada
Cougar Biotechnology
Covidien
CReATe Cord Blood Bank
Crohn's and Colitis Foundation of Canada
CSL Behring
Cubist Pharmaceuticals
Cylex
Dystonia Medical Research Foundation
Edwards Lifesciences
Eisai
Elekta
Eli Lilly Canada
EntreMed
Enzon Pharmaceuticals
Facet Biotech
FIENS
Fio
Foundation Fighting Blindness
Fred Hutchinson Cancer Research Center
GE Healthcare
Genentech
Genome Canada
Genta
Genzyme Canada
Gilead Sciences
Glaucoma Research Society of Canada
GlaxoSmithKline
Government of Ontario
Hana Biosciences
Heart & Stroke Foundation
Holistic Health Research Foundation of Canada
Hospital for Sick Children
Howard Hughes Medical Institute
Humber College
Hypertension Canada
Idenix Pharmaceuticals
Incyte
Informa
Innovive Pharmaceuticals
Insurance Bureau of Canada

Intercept Pharmaceuticals
InterMune
International Association for the Study of Lung Cancer
International Rett Syndrome Foundation
International Science and Technology Partnerships Canada
Janssen
Johnson & Johnson Pharmaceutical Research and Development
Juvenile Diabetes Research Foundation Canada
KAI Pharmaceuticals
Kidney Foundation of Canada
Korea Institute for Advancement of Technology
Lady Tata Memorial Trust
Laval University
Leukemia & Lymphoma Society
Lumen Therapeutics
Lundbeck Canada
Lupus Foundation of America
Lupus Ontario
MaRS Innovation
Mayo Clinic
McEwen Centre for Regenerative Medicine
McGill University Health Centre
McMaster University
Medivation
Medtronic
Merck
Mesothelioma Applied Research Foundation
Michael J. Fox Foundation for Parkinson's Research
MicroVention
Miikana Therapeutics
Millennium Pharmaceuticals
Ministry of Finance - Financial Services Commission of Ontario
Ministry of Health and Long-Term Care
Ministry of Research and Innovation
Mitsubishi Tanabe Pharma
Molecular Insight Pharmaceuticals
Mount Sinai Hospital
Multiple Sclerosis Society of Canada
National Institutes of Health
National Parkinson Foundation
National Sanitarium Association
National Surgical Adjuvant Breast and Bowel Project
Natural Sciences and Engineering Research Council
NCIC Clinical Trials Group at Queen's University
Networks of Centres of Excellence of Canada
Neuroradiology Education and Research Foundation
NoNO
Northern Therapeutics
NovaLung
Novartis
Novo Nordisk Canada
NPS Pharmaceuticals
Olympus
Ontario Association of Medical Laboratories
Ontario Centres of Excellence
Ontario Clinical Oncology Group
Ontario Consortium for Image Guided Therapy and Surgery
Ontario Genomics Institute
Ontario HIV Treatment Network
Ontario Innovation Trust
Ontario Institute for Cancer Research
Ontario Lung Association
Ontario Mental Health Foundation
Ontario Neurotrauma Foundation
Ontario Psychiatric Outreach Program
Onyx Pharmaceuticals
Osiris Therapeutics
Otsuka Pharmaceutical
Ottawa Hospital Research Institute
Paracor Medical
Parexel
Parkinson Society Canada
Partners HealthCare
Pfizer Canada
Philips Electronics North America
Physicians' Services Incorporated Foundation
Pierre Fabre Médicament
Princess Margaret Hospital Foundation
Procter & Gamble Pharmaceuticals
Prostate Cancer Canada
Proteolix
Proteomic Methods
Public Health Agency of Canada
Purdue Pharma Canada
Questcor Pharmaceuticals
Quintiles
RaySearch Laboratories
Rick Hansen Foundation
Roche
Royal College of Physicians and Surgeons of Canada
Royal College of Surgeons of Ireland
Rutgers
Salix Pharmaceuticals
Sanofi-aventis
Schering-Plough Canada
Scottish Rite Charitable Foundation
Seattle Genetics
Sentinel Oncology
Sentinelle Medical
Servier Canada
Social Sciences & Humanities Research Council
Society of American Gastrointestinal and Endoscopic Surgeons
Solutions By Sequence
St. Jude Medical
Stryker Biotech
Sunnybrook Health Sciences Centre
Susan G. Komen Breast Cancer Foundation
Taylor & Frances Group
Terry Fox Research Institute
Terumo Cardiovascular Systems
Teva Neuroscience
Thallion Pharmaceuticals
Thoratec
Threshold Pharmaceuticals
Tibotec Pharmaceuticals
Toronto Dementia Research Alliance
Toronto General & Western Hospital Foundation
Toshiba Medical Systems
Trillium Therapeutics
United States Army Medical Research Acquisition Activity
United States Department of Defense
UCB Pharma
University of California, Los Angeles
University of California, San Diego
University of Texas at Austin
University of Toronto
Vertex Pharmaceuticals
Vision Science Research Program
Vitrolife
W.L. Gore & Associates
Workplace Safety and Insurance Board
Wyeth Canada
YM BioSciences
Younger Foundation

University Health Network

We are a caring, creative and accountable academic hospital, transforming health care for our patients, our community and the world.

UNIVERSITY OF TORONTO

University Health Network is a teaching hospital affiliated with the University of Toronto.

University Health Network
Research Report 2011

www.uhnresearch.ca

Office of the Vice President, Research
University Health Network
610 University Avenue
7th Floor, Room 7-504
Toronto, Ontario, Canada M5G 2M9