

# U of T MEDICINE

DEAN'S REPORT 2011-2012



UNIVERSITY OF TORONTO  
FACULTY OF MEDICINE

# VISION

International leadership in improving health through innovation in research and education

# MISSION

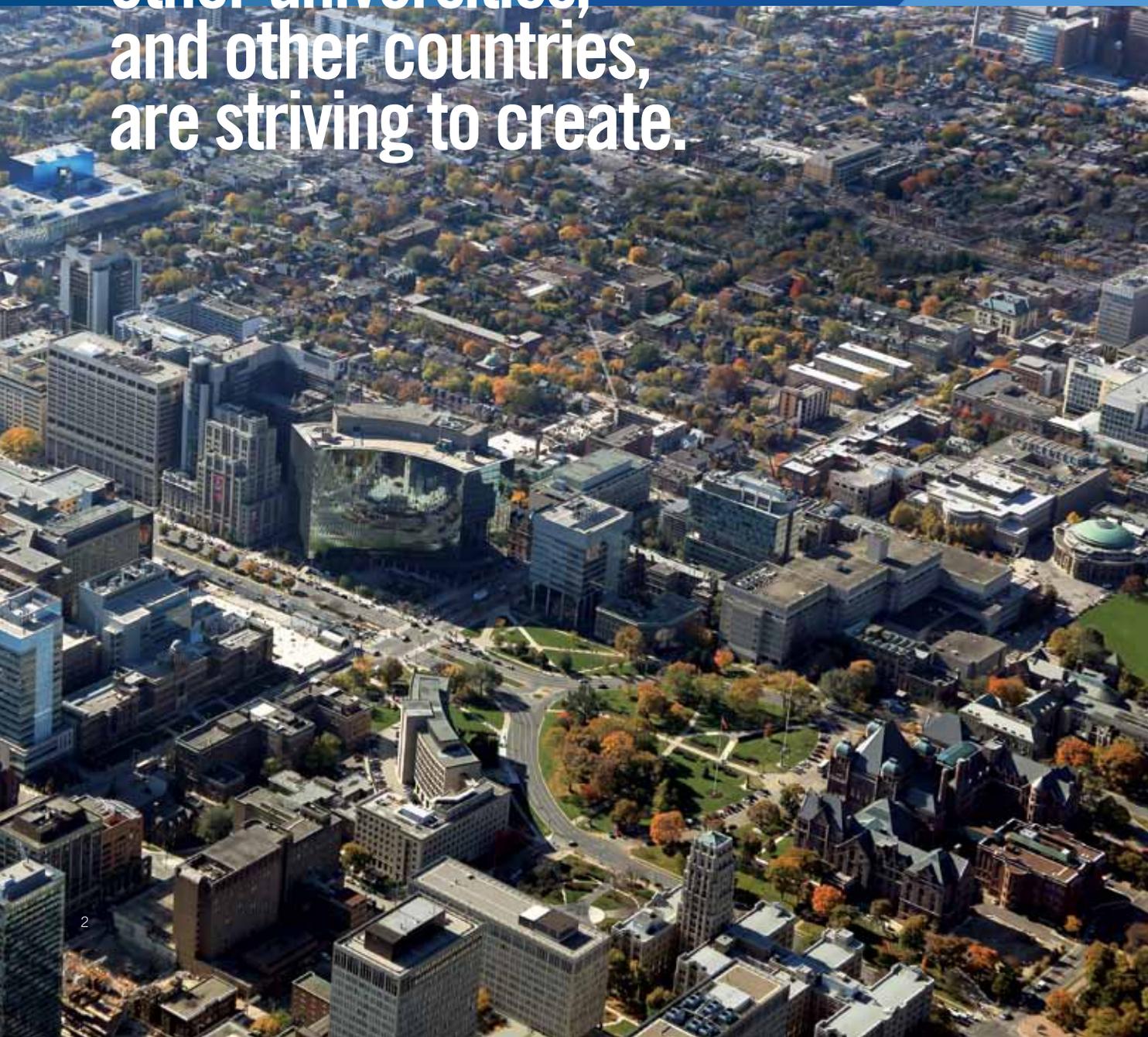
We fulfill our social responsibility by developing leaders, contributing to our communities, and improving the health of individuals and populations through the discovery, application and communication of knowledge

**U of T Medicine:  
Addressing the  
most urgent  
local and  
global health  
challenges  
through  
integration,  
innovation  
and impact**

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**Working together,  
we are delivering  
the innovative and  
interdisciplinary  
research, teaching  
and patient care that  
other universities,  
and other countries,  
are striving to create.**



# DEAN'S MESSAGE



**AS I ENTER MY SECOND TERM AS DEAN AND VICE-PROVOST,** Relations with Health Care Institutions, I am pleased to launch this Dean's Report for 2011–2012. This amazing year has been marked by significant transformation at **U of T Medicine**. We were proud to launch our Strategic Academic Plan 2011–2016, and our updated *Mission* and *Vision*, setting out bold, new directions for the next five years that build upon our record of international leadership to achieve improved health through innovation in research and education.

**U of T Medicine** is uniquely positioned to drive health system transformation across our network, consisting of nine fully affiliated research hospitals and 19 community hospitals and clinical care sites. Working together, we are delivering the innovative and interdisciplinary research, teaching and patient care that other universities, and other countries, are striving to create.

In coming years, we have the opportunity to leap forward in health education and research, to make major contributions of the kind that led to the discovery of insulin, the discovery of stem cells and the identification of the genes responsible for early-onset Alzheimer's disease at the University of Toronto. This legacy – and the promise for the

future – has always been dependent on having a truly outstanding community to draw upon. At **U of T Medicine**, we are fortunate to have the very best students, faculty and staff at all levels.

Whether it is our medical students, graduate students, or graduate MD trainees, we are training the finest young people to become the world's next generation of health professionals and academic leaders. We have the largest MD/PhD program and the largest training program for academic physicians in Canada, which are creating a new generation of health leaders nationally and beyond.

Our faculty members are the pillars of our teaching mandate, but have continually distinguished themselves as world-leading scientists and researchers, attracting students, fellows and colleagues to our growing network, and leading to some of the most innovative collaborations in Canada. This year alone we have launched two new Institutes – the Institute for Human Development and the Institute for Global Health Equity and Innovation – that will bring together a unique cross-section of researchers in medical and other fields to tackle complex and expanding areas of health research.

Finally, let me extend my tremendous gratitude to our broader community of supporters, alumni and philanthropists who continue to play an integral role in the success and development of our Faculty. Their ongoing support and advocacy remains a critical factor in our ability to meet the demands of modern health education and research.

This is an exciting time for our Faculty and I know you will share my pride and inspiration reading the stories on the pages ahead. Thank you for your support for **U of T Medicine**, and I look forward to continuing our legacy of leadership and discovery.

**Catharine Whiteside, MD, PhD, FRCPC**  
Dean, Faculty of Medicine  
Vice-Provost, Relations with Health Care Institutions

# STRATEGIC ACADEMIC PLAN

## YEAR 1 PROGRESS

U of T Medicine's Strategic Academic Plan is guided by six overarching goals that reflect our unwavering commitment to excellence in research, education, and translating knowledge into improved health outcomes. Over the course of this first year of the Plan's implementation, we have achieved a number of notable aims, paving the way for success as we fulfill our strategic goals and realize our Mission and Vision.

# LEADERS IN HEALTH EDUCATION

*“Enabling the enrolment of a more socio-economically diverse student population is a key component to serving the increasingly plural landscape of communities across the province and the nation.”*

## GOAL 1

PREPARE TOMORROW’S LEADING SCIENTISTS AND SCHOLARS, CLINICAL PROFESSIONALS AND ADMINISTRATORS WHO WILL CONTRIBUTE TO FULFILLING THE GOALS OF U OF T MEDICINE

**U OF T MEDICINE OFFERS INNOVATIVE EDUCATION PROGRAMS** that apply leading-edge teaching and learning models to all health professional and graduate students. Our pilot initiatives are driving innovation, discovery and invention through interdisciplinary integration and novel research directions.

In November 2011, U of T Medicine and the University of Hong Kong (HKU) announced a joint educational placement for PhD students, offering them the chance to partner with world-class scientists. The first program matches members of HKU’s Department of Biochemistry in the Li Ka Shing Faculty of Medicine at HKU with members of U of T Medicine’s Department of Molecular Genetics.

“Discovery, invention and innovation transcend national boundaries. The University of Toronto and University of Hong Kong are hotbeds of discovery, and establishing strong partnerships with HKU and other Asian universities is a priority for us,” says Professor Howard Lipshitz, Chair, Department of Molecular Genetics.

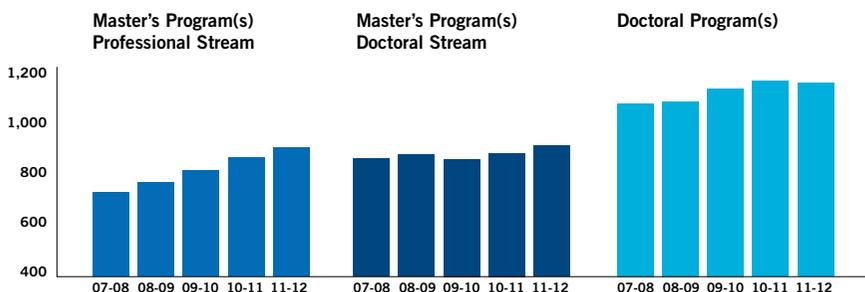
Enabling enrolment of a more socio-economically diverse student population is a key component to serving the increasingly plural landscape of communities across Canada. Our Summer Mentorship Program (SMP) attracts applicants

from high schools across the Greater Toronto Area, giving traditionally under-represented students an opportunity to be mentored by health care practitioners. The SMP gives students a glimpse into university and professional life, and creates a successful entry point into the health sciences.

In the words of SMP alumnus Jamal Depradine: “I will begin studies in the Faculty of Medicine this August. I honestly believe that there is a greater purpose for me being provided with this opportunity; I am committed to performing at my absolute best ... making my family proud, serving my community, providing the guidance and motivation to others that was provided to me... I will remember and represent the Summer Mentorship Program in all of my future activities.”

The growing health care needs of our communities require us to build capacity to address health-related system gaps. We are fulfilling our commitment to aggressively expand graduate enrolment and training programs, ensuring excellence in biomedical science research and preparing health professionals for entry into practice.

## INCREASE IN GRADUATE STUDENT ENROLMENT



Li Ka Shing Faculty of Medicine, University of Hong Kong. Photo courtesy of University of Hong Kong.

# DISCOVERY, INVENTION & INNOVATION

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## GOAL 2

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### LEAD RESEARCH INNOVATION THAT ANSWERS QUESTIONS OF SOCIETAL RELEVANCE

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**OUR RESEARCH ENTERPRISE DEVELOPS AND FACILITATES INTERDISCIPLINARY AND NOVEL** research directions, and accounts for more than half of the total research funding obtained by the University of Toronto. Our Research Strategic Plan 2012–2017 sets the stage for future growth and discovery by establishing and promoting overarching research themes that address existing research strengths, meet social challenges, support foundational health services research and recognize fundamental curiosity-driven research that underlies our innovation agenda.

Four strategic priority areas have emerged: Human Development; Global Health; Neurosciences and Brain Health; and Complex Disorders – System Management, which includes diabetes, cardiovascular disease, musculoskeletal disease and cancer. These priorities address critical challenges and are based on current and developing health research expertise in the U of T Medicine/Toronto Academic Health Science Network (TAHSN) research community.

Answering questions of societal relevance is at the very heart of our newly established Institute for Human Development (IHD). Led by Professors Stephen Lye (Executive Director) and Marla Sokolowski (Academic Director), the IHD is focused on improving human well-being and potential through trans-disciplinary research and knowledge mobilization; development of effective approaches to prevention, early identification and intervention to maintain and promote health and well-being over the life course; and promoting optimal human development leading to increased well-being overall.

Implementing the strategic priorities outlined above requires the availability of highly sophisticated core research infrastructure, clustered around three distinct areas: Health and Bioinformatics; Integrated Functional Imaging; and Knowledge Exchange, Translation and Commercialization.

# TRANSLATING KNOWLEDGE INTO ACTION

## GOAL 3

TRANSLATE DISCOVERIES TO IMPROVE HEALTH AND PROSPERITY IN OUR COMMUNITY AND AROUND THE WORLD

**WE ARE BRIDGING THE QUALITY GAP IN HEALTH CARE THROUGH** innovative ideas such as the Toronto Virtual Ward, as profiled on page 11. Using known statistics on the increased rates of hospital readmission among high-risk patients, the Virtual Ward offers a dynamic new solution, where immediately following discharge of patients with complex chronic conditions from acute care hospitals, health professionals from multiple disciplines coordinate efforts to provide individualized care in the patient's home setting. Supporting those individuals in the Toronto Virtual Ward is vital to improving the health of our community.



The Virtual Ward team meets to do rounds.

# GLOBAL HEALTH EQUITY

## GOAL 4

SHARE OUR INNOVATIONS AND EXPERTISE GLOBALLY THROUGH STRATEGIC PARTNERING TO ADVANCE GLOBAL HEALTH AND INTERNATIONAL RELATIONS

**WHILE DEVELOPING MEDICINE'S STRATEGIC PLAN, WE PUBLISHED** our Roadmap for Global Health 2011–2016, which focuses on optimizing collaboration and exchange, advancing research, providing learner-focused educational offerings and engaging in effective, sustainable partnerships. With the endorsement of the faculty, staff and learners, our academic departments and units are embedding a global health orientation in their curriculum, supporting faculty and learners' local and international experiences, and establishing partnerships across the globe.

We are advancing scholarship in the area of global health through interdisciplinary initiatives such as the newly established Institute for Global Health Equity and Innovation. This extra-departmental unit is centred in the Dalla Lana School of Public Health, division of global health, and is poised to engage in complex global health equity problem-solving that will lead to improved health through trans-disciplinary research and knowledge mobilization. The Institute looks at critical global health issues including (but not limited to) indigenous and circumpolar health, population and public health, global health ethics and human rights, and global infectious disease control.

# AN INTEGRATED NETWORK

# SUPPORTING EXCELLENCE

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## GOAL 5

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CREATE A COLLECTIVE VISION FOR A SHARED ACADEMIC FUTURE WITH THE TORONTO ACADEMIC HEALTH SCIENCE NETWORK (TAHSN), UNIVERSITY OF TORONTO FACULTIES, ESPECIALLY HEALTH SCIENCES, AND COMMUNITY PARTNERS

**THE TORONTO ACADEMIC HEALTH SCIENCE NETWORK (TAHSN)** leads Canada in the calibre and dynamism of its research, education and clinical care accomplishments. U ofT Medicine is committed to working closely with our TAHSN partners to achieve our shared goals. Full integration across the network will engender a culture of innovation, discovery and invention, creating optimal conditions for positive change.

Exemplary in this area is our Department of Psychiatry, which is driving change in the treatment of mental illness across the Greater Toronto Area. As part of the Toronto Mental Health and Addictions Acute Care Alliance, Psychiatry demonstrates its commitment to individuals with acute care needs by taking coordinated steps towards reducing wait times in emergency departments and in accessing acute care inpatient beds and lowering rates of readmission. Collaborating with colleagues across and beyond TAHSN, the department uses cross-hospital data collection and reporting processes as well as coordinated reporting on the flow of alliance patients to improve the experience of patients with mental health care needs. U ofT Medicine's Department of Psychiatry fulfills its social responsibility with a timely, respectful, client-centred approach to care.

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## GOAL 6

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INVEST STRATEGICALLY IN ACADEMIC PRIORITIES IN SUPPORT OF OUR LEARNERS, FACULTY AND STAFF TO PROVIDE FOR THEIR SUCCESS

**U OF T MEDICINE PROVIDES FOR THE SUCCESS OF LEARNERS,** faculty and staff by investing strategically on all fronts. In particular, our focus is on the optimal performance of administrative structures, advancement, strategic communications and financial management. In 2011, we established the Office of Strategy, Communications and External Relations (OSCER). Our Master Plan for revitalization of our space and facilities is underway, as is a new approach to financial management. The expansion of these existing enabling administrative platforms and the development of new ones create a foundation for organizational excellence. Strengths in Advancement and Alumni Relations are evidenced by growth in both. U ofT Medicine is poised to launch its Boundless campaign in September 2012.

# TORONTO ACADEMIC HEALTH SCIENCE NETWORK (TAHSN) BY THE NUMBERS

## 9 fully affiliated hospitals

1. Baycrest
2. Sunnybrook Health Sciences Centre
3. Holland Bloorview Kids Rehabilitation Hospital
4. Centre for Addiction and Mental Health (College Street, Queen Street)
5. Women's College Hospital
6. University Health Network (Toronto General Hospital, Princess Margaret Hospital, Toronto Western Hospital, Toronto Rehabilitation Institute)
7. Mount Sinai Hospital
8. The Hospital for Sick Children
9. St. Michael's Hospital

## 19 community-affiliated hospitals and health care facilities

Community affiliates that are associate members of TAHSN

1. North York General Hospital
2. St. Joseph's Health Centre
3. Toronto East General Hospital
4. Credit Valley Hospital and Trillium Health Centre

## Community affiliates

1. Royal Victoria Hospital
2. Southlake Regional Health Centre
3. Lakeridge Health
4. The Scarborough Hospital
5. Providence Healthcare
6. Hincks-Dellcrest Centre
7. Bridgepoint Health
8. Surrey Place Centre
9. Humber River Regional Hospital
10. St. John's Rehab Hospital
11. West Park Healthcare Centre
12. George Hull Centre for Children and Families
13. Markham Stouffville Hospital
14. Waypoint Centre for Mental Health Care
15. Ontario Shores Centre for Mental Health Sciences

# LEADERSHIP

From pinpointing genes that cause life-threatening diseases to improving care for patients suffering from complex conditions, solving health care's greatest challenges isn't easy. Real-world innovations that improve lives are less the product of singular eureka moments in individual labs, and more the result of strategic collaborations across disciplines and even continents.

Our physical structures are incubators for cross-disciplinary research and teaching. We're at the heart of powerhouse international teams unravelling enduring health mysteries. And our local integrated health teams are models that ease the growing burden on health systems at home and abroad.

Collaboration. Integration. Interdisciplinary research. A healthier future depends on this type of approach, and U of T Medicine is leading the way.

# COMPLEX DISEASES: SOLUTIONS THAT IMPROVE HEALTH

## VIRTUAL WARD PROGRAM

IN TORONTO, MORE THAN ONE-THIRD OF HIGH-RISK PATIENTS ARE READMITTED TO THE HOSPITAL WITHIN 90 DAYS OF THEIR STAY

**THE VIRTUAL WARD PROGRAM SUPPORTS PATIENTS** with hospital-like care at home – providing a single point of contact, 24-hour access to a doctor, an interdisciplinary team and a shared set of notes – so they don't end up back at the hospital.

Patients are “admitted” to the Virtual Ward after being discharged from one of four University of Toronto general internal medicine clinical teaching units. The Virtual Ward team members, most of whom work for the Toronto Central Community Care Access Centre, meet daily at Women's College Hospital to decide how best to support each patient.

“Our interdisciplinary team – made up of a doctor, two care coordinators, a part-time pharmacist, an assistant and nursing support – reviews patient treatment plans, reconciles medications and coordinates with family doctors and patients, ensuring they receive supportive, coordinated care and can respond to potential problems before patients are forced to come back to the hospital,” says Professor Irfan Dhalla, of U of T's Department of Medicine and Institute of Health Policy, Management and Evaluation, who is also affiliated with St. Michael's Hospital.

The Virtual Ward is being evaluated in a Canadian Institutes of Health Research-funded randomized controlled trial and also serves as a venue for medical students and residents to learn how to best care for complex patients, according to Professor Tara O'Brien, from U of T's Department of Medicine and Women's College Hospital.



The Virtual Ward team meets to do rounds.



### A sodium reduction strategy

Canadians consume more than twice their recommended daily intake of salt

This is, says **Professor Mary L'Abbé**, one of the country's most pressing health problems. Sodium elevates blood pressure, which in turn raises the risk of cardiovascular disease. The World Health Organization (WHO) has recognized hypertension as the leading preventable cause of death – in Canada and other developed nations, and in developing countries.

The good news is that reducing salt consumption is a manageable lifestyle change that can improve heart health, and it is one of the most cost-effective and efficient interventions.

To spur that change, the Government of Canada launched the Sodium Working Group, a diverse panel of scientists and experts from the food manufacturing and service industries, consumer advocacy groups, health professional organizations and government, chaired by L'Abbé, which recently published the Sodium Reduction Strategy for Canada.

The report provides Canadians with a roadmap for lowering their sodium intake by a modest one-third to about one teaspoon per day.

“The report is a starting point,” says L'Abbé, the Earle W. McHenry Professor and Chair in the Department of Nutritional Sciences. “It calls for a voluntary reduction of sodium in processed foods – which account for about 75 percent of salt intake – education of consumers, industry and health professionals; and more research.”

To address the last point, L'Abbé has just begun a study evaluating the effectiveness of the strategy, funded by the Canadian Institutes of Health Research and the Canadian Stroke Network, results of which are expected in 2015.

# DISCOVERY ZONE



## Cracking the code for complex diseases

How does a finite number of genes produce the vast biological complexity found in the human body?

That question has vexed scientists in the decade since the sequencing of the human genome, when it became clear that humans have only about 22,000 protein coding genes, roughly the same number as found in relatively simple organisms such as the nematode worm.

One emerging explanation is “alternative splicing,” a process that allows one gene to produce a multitude of different genetic messages.

In a landmark advance that was featured on the cover of the scientific journal *Nature*, **Professors Benjamin Blencowe** and **Brendan Frey** recently deciphered a code that predicts when and where gene splicing events will occur. The pair, who work together in the Terrence Donnelly Centre for Cellular and Biomolecular Research and the Bahen Centre for Information Technology, received the 2011 NSERC John C. Polanyi Award for their work.

“One application of the code is that it’s allowing researchers to find genetic errors that lead to complex diseases,” says Frey, a Professor in the Edward S. Rogers Sr. Department of Electrical and Computer Engineering and the Donnelly Centre.

Moreover, says Blencowe, also a Professor in the Donnelly Centre and Department of Molecular Genetics, “A better understanding of the splicing code will facilitate the design of new therapies directed at correcting splicing defects that cause or contribute to disease.”

## DONNELLY CENTRE

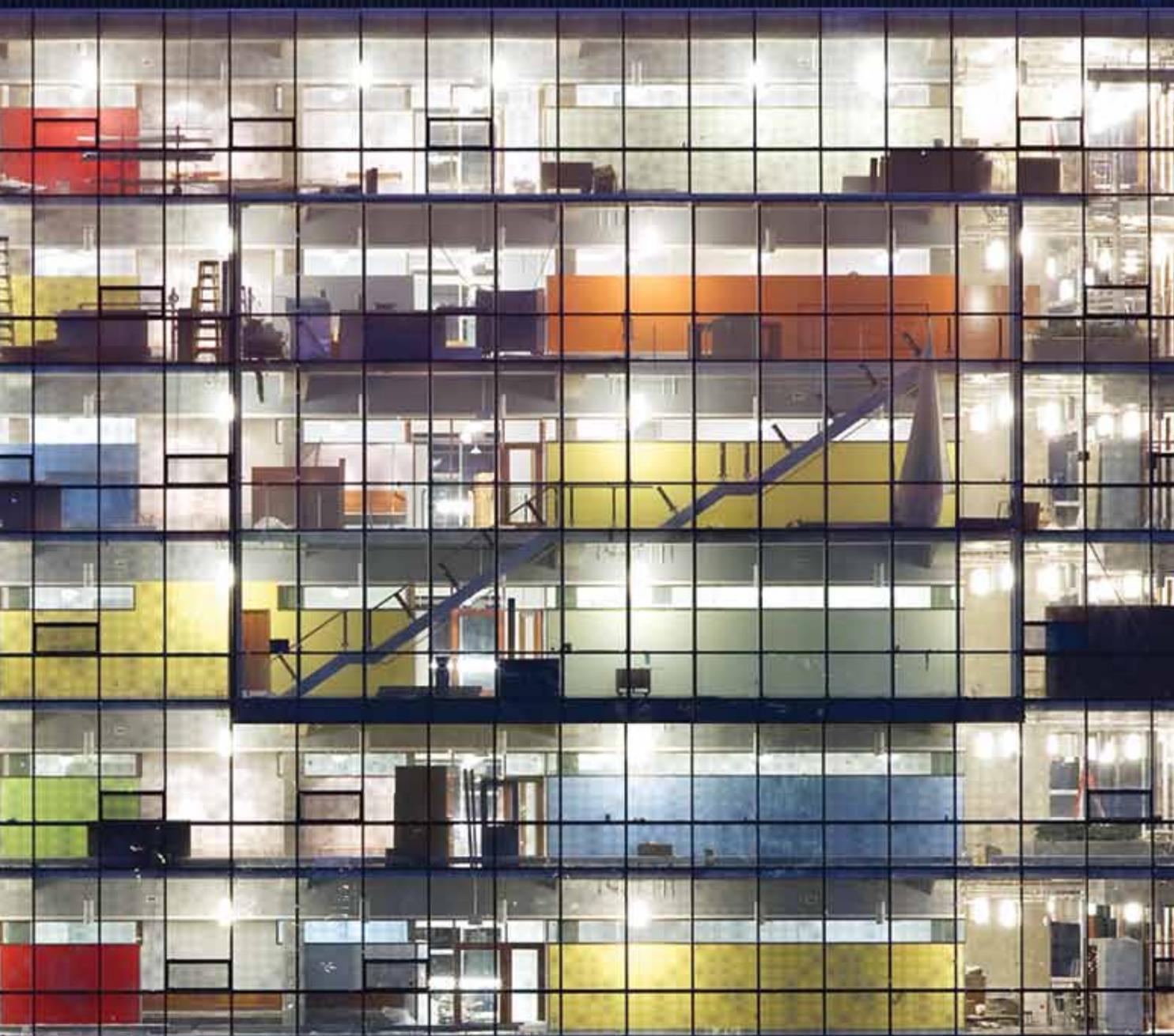
ANTIBODIES. THEY ARE NOT A MAGIC BULLET FOR CANCER, BUT THEY COULD BE ENGINEERED TO BE ONE

**GENERATED BY THE IMMUNE SYSTEM** to recognize foreign threats such as bacteria and viruses, antibodies have been conscripted by scientists over the last decade to fight cancer and other complex diseases with unprecedented specificity – the drug Herceptin being a case in point.

Leading this charge is the Terrence Donnelly Centre for Cellular and Biomolecular Research, a dynamic nexus of medicine, biology, chemistry, engineering, computer science and pharmacy. The centre’s newly established Toronto Recombinant Antibody Centre (TRAC), a collaboration among Donnelly Centre investigators, academic researchers from across Ontario and industry, has developed thousands of new, potentially therapeutic antibodies targeting molecules that have emerged as relevant in the pathogenesis of cancer and other diseases in the post-genome era.

TRAC director Professor Sachdev Sidhu and his colleagues use what are called phage-displayed antibody fragment libraries to generate antibodies synthetically, in a lab dish.

“Synthetic techniques allow for rapid production of many more diverse and specific antibodies,” says Sidhu, a professor in the Donnelly Centre and Department of Molecular Genetics. “As well, we can construct them on optimized human frameworks that minimize the chances of an unwanted immune response, which means they have tremendous potential as therapeutic agents.”



# SHAPING THE FUTURE OF HEALTH EDUCATION

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## INTERPROFESSIONAL HEALTH LEADERSHIP COLLABORATIVE

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**WHEN THE PRESTIGIOUS U.S. INSTITUTE OF MEDICINE** put out a request for proposals from universities around the world to participate in an international project to develop innovative approaches to health education, Professors Sarita Verma (Deputy Dean, Faculty of Medicine) and Maria Tassone (Director, Centre for Interprofessional Education and Senior Director, Health Professions and Inter-professional Care & Integration, University Health Network) brought together colleagues from the University of British Columbia, Northern Ontario School of Medicine, Queen's University and Université Laval to create a unique Canadian partnership that included the Faculties and Schools of Medicine, Nursing, Public Health and inter-professional education programs at each of the five universities. Selected from proposals submitted across the continent, the Canadian Interprofessional Health Leadership Collaborative (CIHLC) was chosen to represent North America as one of four global innovation collaboratives alongside three other successful proposals from India, Uganda and South Africa.

Building off the work of the seminal *Lancet Commission*, the focus of the CIHLC project is on the theme of collaborative leadership for health system change, transforming health and teaching across Canada and North America with approaches that can be transferable globally.

“Emerging societal trends, such as health disparities, the complexity of chronic illnesses and the movement towards community-centred care are challenging health professionals to find new ways of delivering care and providing collaborative leadership,” says Verma. “That’s why it’s critically important for us to focus on the types of collaborative leadership skills and competencies that students and learners require to effectively work in diverse and culturally sensitive environments.”

Total research funding: 2010–11

**\$792** million  
in funding

**1,613**

Researchers holding research funding

**8,317**

Research grants and contracts

Canada Foundation for  
Innovation (CFI) / Ontario  
Innovation Trust (OIT)  
funding 2010–11

**\$97.5 million**

Number of Canada Research  
Chairs (CRCs) held by the  
Faculty of Medicine:

**121 CRCs** are held by  
the Faculty of Medicine

On-campus faculty hold  
**37 CRCs**

Our nine fully affiliated  
hospitals hold **84 CRCs**

Canadian Institutes of  
Health Research (CIHR)  
funding in 2010–11

Faculty of  
Medicine  
total:  
**\$156 million**

This represents  
a 19% share  
of all available  
CIHR funding  
across Canada

Extra-departmental units (EDUs) are organized around emerging research and teaching areas that span disciplines. Because they require flexibility, the University of Toronto has defined four categories of EDUs. The following newly established extra-departmental units in 2011–12 represent exciting new interdisciplinary collaborations:

Institute for Health  
Policy Management and  
Evaluation (EDU-A<sup>1</sup>)

Institute for Human  
Development (EDU-C<sup>2</sup>)

Institute for Global  
Health Equity and  
Innovation (EDU-C)

Musculoskeletal  
Centre (EDU-C)

<sup>1</sup> EDU-A is equivalent to a university department with the ability to appoint faculty to the university and to oversee university degree programs.

<sup>2</sup> EDU-C is an interdisciplinary academic unit engaged in research and education, but does not appoint faculty to the university nor oversee degree programs.

# DISCOVERY

From the development of insulin to the discovery of stem cells, U of T Medicine has been at the forefront of life-changing health research and innovation for more than a century, and our legacy continues.

Today, located at the heart of an unparalleled health network that includes nine fully affiliated hospitals and 19 community-affiliated hospitals, our extraordinary pool of world-leading scientists continues to achieve medical miracles in every branch of the health sciences.

At the molecular level, our researchers are cracking the code for life-threatening diseases that impact millions worldwide. We're developing novel therapies that vastly improve quality of life and creating cutting edge technologies that revolutionize the way diseases are detected. Faculty-led spin-off ventures hold incredible promise for transforming the delivery of health care and supporting human health in years to come.

# THE PROMISE OF STEM CELLS



## New technologies to guide tissue regeneration

Stem cells, which can become any type of cell in the body, are at the cutting edge of medical science as potential avenues for drug development and disease therapies. Although fewer than one in 10,000 cells in our bodies are stem cells, these cells are central to the normal function of our tissues.

By examining the molecular mechanisms that control stem cell fate and engineering technologies to impose this control, **Professor Peter Zandstra** and his team are developing new technologies to guide tissue regeneration. The professor at U of T's Institute of Biomaterials and Biomedical Engineering and Department of Chemical Engineering and Applied Chemistry says the unique interdisciplinary make-up of his lab is helping to propel regenerative medicine forward.

"We try to combine key aspects of biology and engineering labs – using tools ranging from mathematical modeling and device fabrication to viral transductions and molecular and cell biology," says Zandstra, who also holds the Canada Research Chair in Stem Cell Bioengineering at the Terrence Donnelly Centre for Cellular and Biomolecular Research and is Chief Scientific Officer of the Centre for Commercialization of Regenerative Medicine at U of T.

"Stem cells and their derivatives may represent next generation 'drugs,'" says Zandstra. "In the future, through the efforts of many labs and many types of research, curing degenerative diseases using living cells may be possible."



## Restoring vision

Recently, **Professor Derek van der Kooy** and his colleagues performed a medical miracle: they restored sight to blind mice.

By culturing retinal stem cells from adult human donor eyes in a lab dish, the researchers were able to grow and then inject photoreceptors, the rods and cones crucial to the magical translation of light into vision, into the eyes of previously blind mice.

That remarkable advance has helped set the stage for clinical therapies that could cure blindness.

"The biology underlying the eye in humans and mice is largely the same," says van der Kooy, a professor in the Department of Molecular Genetics whose lab is housed in the Terrence Donnelly Centre for Cellular and Biomolecular Research. "The big challenge now is growing enough of the cells and integrating them with the other component cells of the host retina."

The impact of solving that challenge would be huge. In people over 60, age-related macular degeneration is the main cause of blindness and it is the dying off of photoreceptors in that condition that produces the dark patches that eventually cloud out vision.

# THE FUTURE OF NEUROSCIENCE

## THE TANZ CENTRE FOR RESEARCH IN NEURO-DEGENERATIVE DISEASES

### A GLOBAL POWERHOUSE IN BRAIN DISEASE RESEARCH

**IN THE SHORT TIME SINCE THE TANZ CENTRE** was founded in 1990, it has made many of the world's most important discoveries about the genetics of Alzheimer's disease and contributed key new knowledge about Parkinson's and other neurodegenerative diseases.

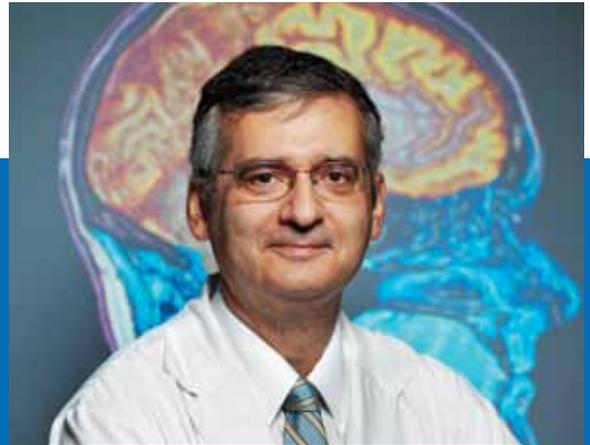
With an aging population and staggering estimates of the growing worldwide burden of these diseases, the Tanz Centre researchers – led by internationally-renowned neurologist Peter St George-Hyslop – are unwavering in their commitment to find the answer to prevent, treat and repair damage done by these illnesses. Among the current team of scientists and primary investigators recruited from around the world are experts in genetics, biophysics, protein interactions, neuroimaging, behaviour and neuropathology, among others.

“When the Tanz Centre was founded, we realized that by bringing together experts on a range of neurodegenerative diseases, and not just Alzheimer's, we learned important new information that applied to other diseases as well, sometimes in unexpected ways,” says St George-Hyslop.

It's this powerful mix of expertise that continues to drive discoveries like the Tanz Centre's contributions to the discovery of a gene responsible for upwards of 30 percent of amyotrophic lateral sclerosis (ALS)/frontal temporal dementia cases and to move this new knowledge upstream.

Similarly, researchers at the Tanz Centre have discovered novel variants in genes causing Parkinson's disease and identified their roles in disrupting key cellular pathways, the first steps in the ongoing search for innovative therapeutic strategies.

In the past decade, Tanz Centre scientists have been awarded more than 50 major international and national scientific awards and prizes and received roughly \$50 million in peer-reviewed funding. With a move to the spectacular new Krembil Discovery Centre at Toronto Western Hospital planned for 2013, the Tanz Centre will continue to be at the forefront of solving the mystery of neurodegenerative diseases – and improving the health of future generations.



### Hope for Alzheimer's patients

As the world's population ages, rates of Alzheimer's disease are rising dramatically. By 2030, nearly 66 million people will be living with Alzheimer's, robbed of their memories by this degenerative disease.

Not if **Professor Andres Lozano** can help it.

This Surgeon-Scientist who pioneered the use of deep brain stimulation to treat depression recently made international headlines when he reversed brain shrinkage in some patients with mild Alzheimer's by delivering tiny pulses of electricity directly to the brain.

Now Lozano, Professor of Surgery and Dan Family Chair in Neurosurgery, is preparing to broaden the scope of his research by implanting electrodes in 50 patients with mild Alzheimer's disease. The outcome in patients receiving stimulation through implanted electrodes will be compared with those who do not receive stimulation, so Lozano's team can determine whether deep brain stimulation has effects on cognitive function, brain activity and on the size of the hippocampus region of the brain, which plays an important role in memory.

“Now that we know we can use electricity to activate areas of the brain that are damaged by disease, the possibilities are endless,” says Lozano, who also holds the RR Tasker Chair in Functional Neurosurgery with the University Health Network. “From Alzheimer's, Parkinson's and other neurodegenerative diseases to depression, obsessive compulsive disorder and Tourette's syndrome, deep brain stimulation holds extraordinary promise for improving the lives of people around the world.”

# IMPACT

At the heart of U of T Medicine is the ability to harness our exceptional achievements to make a transformative impact on the communities we serve. We have broadened our reach in educating tomorrow's physicians – the Mississauga Academy of Medicine represents a crucial expansion into what is now Canada's sixth largest major city. This will make a sizeable contribution to meeting the primary care needs of a burgeoning community in southern Ontario.

Our postgraduate medical education program supplies more than half of all practising specialists in Ontario and more than one-third of all family physicians in the province. We have a collaborative program with The Michener Institute and the Northern Ontario School of Medicine for a U of T degree for physician assistants, which graduated its first class in 2012 and is a major solution for accessible care for Ontarians. In addition, more than 27,000 health professionals across multiple disciplines engage with U of T Medicine in a life-long learning relationship through superb continuing education and professional development. Translating this knowledge into improved health is at the core of our Vision and Mission.

The impact of U of T Medicine's research enterprise stretches to all corners of the globe. Through their work, our scholars and scientists transcend boundaries, creating new knowledge in health and biomedical sciences for the equitable benefit of all.

# IMPROVING THE HEALTH OF CANADIANS

## THE MISSISSAUGA ACADEMY OF MEDICINE

**THE MISSISSAUGA ACADEMY OF MEDICINE (MAM)** opened its doors in September 2011 with its premier class of 54 first-year medical students and by all accounts, it was a banner inaugural year. By 2015, the medical student enrolment in MAM will number 216.

Recognizing the importance of providing care and training health professionals in growing communities, the University of Toronto embarked on a partnership with the University of Toronto Mississauga and the Credit Valley Hospital and Trillium Health Centre to deliver the first-ever medical education program in the vibrant Peel Region of Ontario.

Located inside the new Terrence Donnelly Health Sciences Complex and developed with the visionary support of primary donors Terrence Donnelly and Carlo Fidani, MAM is a state-of-the-art facility with a dedicated fibre-optic network that connects U of T Medicine students, staff and faculty across multiple learning sites. The Complex won the 2012 Ontario Association of Architects Award and the Governor General's Gold Medal recognizing outstanding achievement in architecture, and is LEED (Leadership in Energy and Environmental Design) Silver Certified for its innovative, environmental design.

More than anything, MAM is proud of its students' active participation in campus life – from engaging in community outreach activities like the Saturday Morning program (which provides support and mentorship to local high school students) and Adventures in Science, which pairs medical students with high school students organizing an event-filled day of science activities for local Grade 6 students.



20 Terrence Donnelly Health Sciences Complex.  
Photo courtesy of Dave Mazierski.

## IMAGINE CLINIC

### PATIENTS WHO ENTER THE IMAGINE CLINIC EXPERIENCE A NEW KIND OF HEALTH CARE

**THEY WILL BE TREATED REGARDLESS** of whether they have an OHIP card or identification. Their caregivers are unpaid volunteers. And they will receive care not from an individual, but a team, comprised of students and professionals from the University of Toronto's Faculties of Medicine, Nursing, Pharmacy and Social Work.

While the health care of the future will not be free, it will look a lot like the inter-professional model of IMAGINE Clinic, says Enoch Ng, an MD/PhD student who co-directs the clinic with Social Work student Yick Kan Cheung.

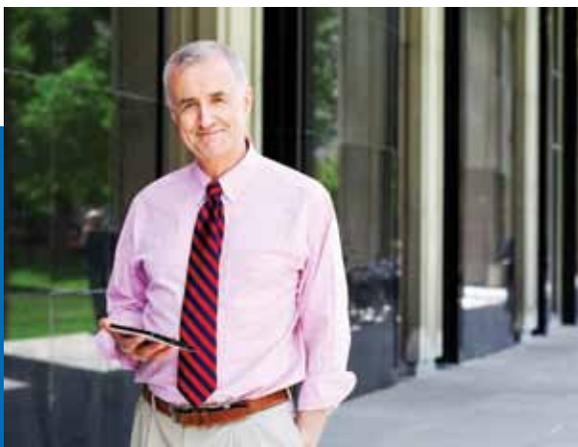
Conceived by MD/PhD student Sagar Dugani, the clinic opened its doors in 2010 to serve Toronto's marginalized communities and to provide students, under the supervision of licensed professionals, with a cross-disciplinary environment to apply their training and learn from each other.

"Working collectively allows us to provide more holistic care than we could as individuals," says Ng. "It's a chance to apply the concept of inter-professionalism, which works particularly well with our population of patients, many of whom have multiple conditions which are tied to social determinants of health like housing, education and nutrition."



Enoch Ng and Yick Kan Cheung, co-directors of IMAGINE Clinic.  
Photo courtesy of Lodee-Laura Haines-Wangda.

# AN INTERNATIONAL IMPACT



## Wireless house call

As an ambulatory care centre, Women's College Hospital in Toronto does not house patients more than a day – even after surgery. This constraint has challenged staff, but also bred innovation.

**Professor John Semple's** post-operative mobile app is a case in point. Semple, a professor in the Department of Surgery at U of T and surgeon-in-chief at Women's, helped create the app with a company called QoC Health (QoC stands for quality of care) so he could assess patients after surgery with a hand-held tablet from any location. Patients can securely and confidentially answer questions about their recovery and send him photos of their incision via their own mobile device, effectively receiving a wireless house call.

"The ability to monitor a patient's recovery daily is relatively new to surgery. It allows us to notice problems such as infection earlier, or provide immediate reassurance to a concerned patient when things are perfectly normal," says Semple.

It also has the potential to dramatically reduce health care costs by limiting the need for patients to see their surgeons post-operatively.

Semple piloted the app this year in a small study at Women's. While he and his team have yet to crack open all their data, the preliminary results suggest the trial went extremely well, says Semple. Their next step, which they are taking with QoC Health, is to market and distribute the technology to other health care organizations in Toronto and Canada.



## Collaborating across continents

From teaching family medicine in her clinic to working with health experts in Africa, **Professor Katherine Rouleau** has made it her mission to collaborate with inspiring colleagues to build primary care capacity around the world. In 2009, Rouleau introduced a Global Health Enhanced Skills Program in family medicine in partnership with St. Gabriele's Hospital in Namitete, Malawi. The program allows postgraduate students from the Department of Family and Community Medicine to train and work in the hospital, contributing to the exchange of knowledge and expertise between health care providers in Malawi and Canada to strengthen health care worldwide.

She is also a part of the Toronto Addis Ababa Academic Collaboration-Family Medicine initiative that is working with Ethiopian colleagues at Addis Ababa University to develop the country's first Family Medicine curriculum based on their country's primary health care needs.

But in her teaching at U of T and in practice, Rouleau – who is Global Health Program Director at the Department of Family and Community Medicine and practises at St. Michael's Hospital – stresses that a collaborative approach centred around mutual learning is critical when it comes to building primary care capacity around the globe.

"Everything we've accomplished is through collaboration. We establish a mutual commitment rather than parachuting in and being directive. It is a mutual learning experience," says Rouleau. "The richness of our programs is in the quality of the community, the hospital, the medical director and the fact that this is rooted in a mutually recognized partnership with them."

# AN INTERNATIONAL IMPACT



## The Million Death Study

“You can learn a lot from a dead person.” So says **Professor Prabhath Jha**, the mastermind behind one of the world’s largest-ever mortality studies and director of the Centre for Research in Global Health at U of T and St. Michael’s Hospital.

Ten years ago, Jha launched the Million Death Study in India with the Registrar General of India to get a better sense of how people were dying in a country where death registration is uncommon and many people die at home without medical care. By going door-to-door interviewing family members about recent deaths, Jha’s teams uncovered startling new information that is shattering long-held assumptions about health in one of the world’s largest and fastest-growing economies and changing global health priorities.

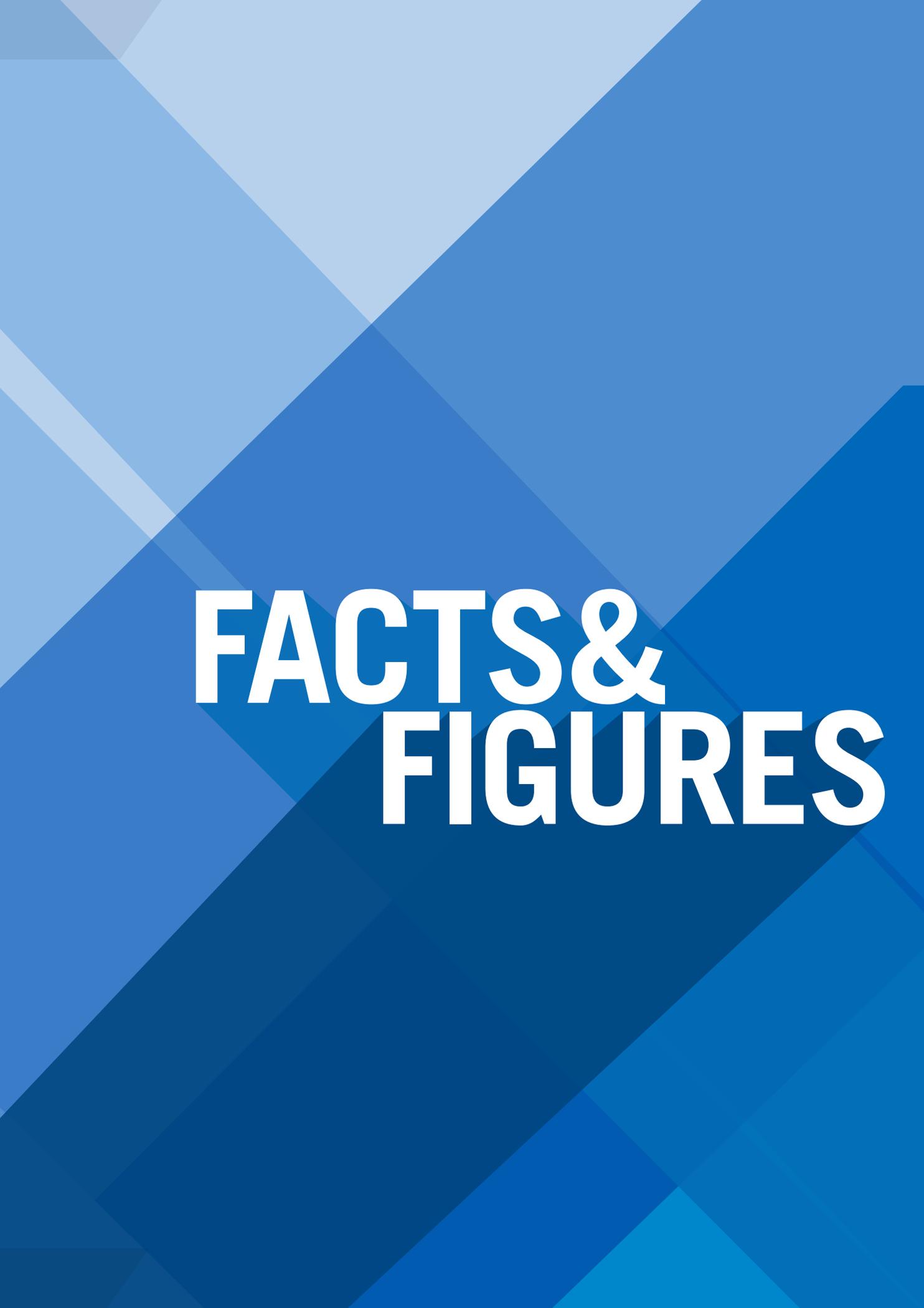
The study found that malaria deaths in India were wildly underestimated by the WHO, but that United Nations figures on HIV/AIDS deaths were far too high. Smoking alone accounts for one in 10 of all Indian deaths and suicides were also found to kill more Indians than previously reported. Recently, Jha reported that as many as 12 million Indian girls might have been aborted before birth due to cultural preferences for sons.

Jha believes that the Million Death Study can paint a clearer picture about where public health efforts should be focused and could contribute to a rapid decline in premature deaths in India and worldwide.

“Our statistics are not just about the dead. They’re about how to help the living,” he recently told the *Toronto Star*.



Survey teams on the ground in India.

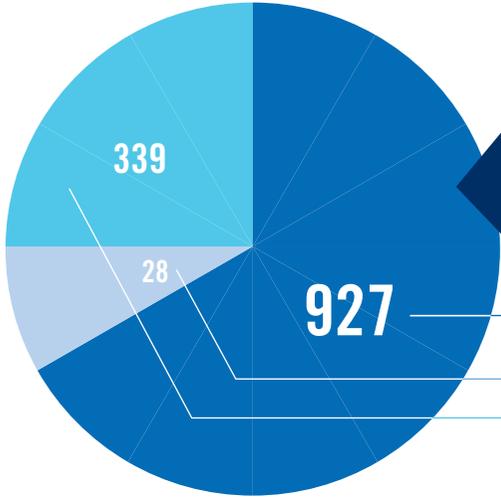


# **FACTS & FIGURES**

# FACTS & FIGURES

Total Student Enrolment  
2011-2012 (all programs)

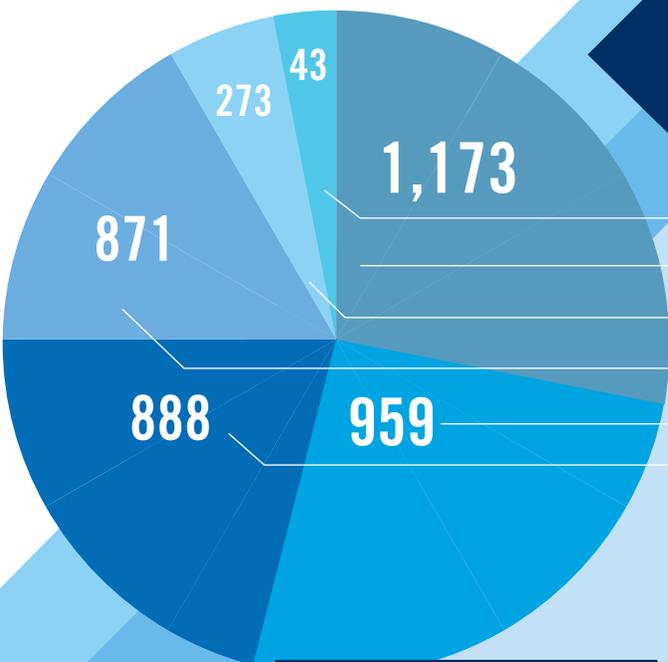
# 8,656



Total Undergrad  
**1,294**

- Undergraduate MD Program
- Physician Assistant Program
- Medical Radiation Sciences

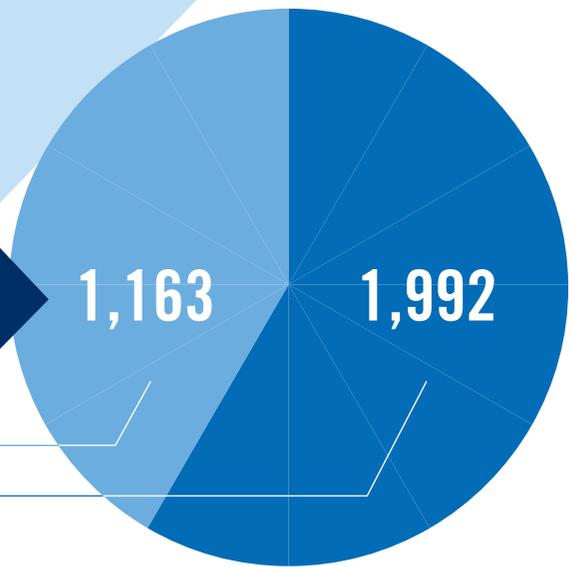
Total Grad  
**4,207**



- MD/PhD Program
- Doctoral Program
- Postdoctoral Fellows (U of T)
- Master's Program (Professional)
- Postdoctoral Fellows (Hospitals)
- Master's Program (PhD Stream)

Total Postgrad  
**3,155**

- Clinical Fellows
- Residents



2011 Higher Education  
Evaluation & Accreditation  
Council of Taiwan  
(HEEACT)\*

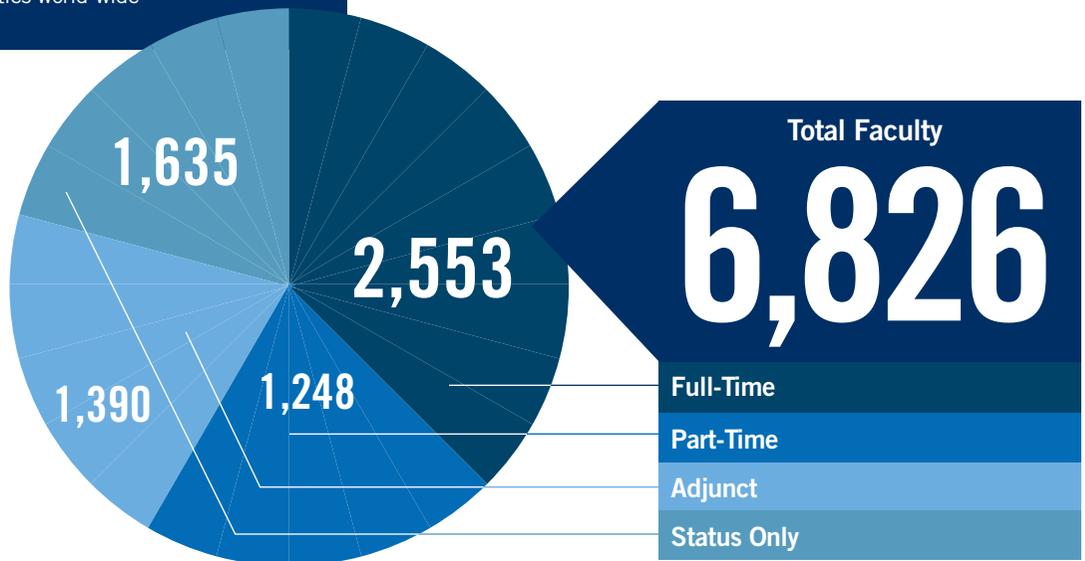
**9th** overall  
**1st** in Canada  
**4th** in Clinical  
Medicine  
sub-category

\* Ranking focuses on research bibliometric  
analysis of 500 research-intensive  
universities world-wide

2011–12 Times Higher  
Education Global Ranking\*

**19th** overall  
**17th** in  
Pre-clinical,  
Clinical and  
Health

\* Ranks the world's top universities in re-  
search, teaching and knowledge transfer



## 2011 Thomson Reuters survey

U of T topped **15 fields**  
in Canada in total citations:  
chemistry; materials science;  
engineering; space science;  
mathematics; ecology/environment;  
clinical medicine; immunology;  
biology and biochemistry;  
molecular biology/genetics;  
neurosciences; pharmacology;  
psychology/psychiatry; education;  
and economics and business.

When examining impact  
(average citations per paper),  
U of T ranked first in Canada  
for **five fields**: engineering;  
microbiology; biology and bio-  
chemistry; molecular biology/  
genetics; and education.

# FACULTY AWARDS AND HONOURS 2011–2012

## INTERNATIONAL AWARDS

### RESEARCH

Eleftherios Diamandis	American Association for the Advancement of Science, Fellow
Michael Fehlings	Reeve-Irvine Research Medal for Spinal Cord Injury Research
Charles Tator	Reeve-Irvine Research Medal for Spinal Cord Injury Research
Laszlo Endrenyi	American Association of Pharmaceutical Scientists, Fellow
Prabhat Jha	American Cancer Society 2012 Luther L. Terry Award for Research Outstanding Contribution
Dafna Gladman	American College of Rheumatology, Master
Angela Colantonio	American Congress of Rehabilitation Medicine, Fellow
Luc De Nil	American Speech-Language-Hearing Association, Fellow
Charles Tator	American Spinal Injury Association, Lifetime Achievement Award
Michael Jewitt	American Urological Association, Distinguished Contribution Award
Daniel Drucker	European Association for the Study of Diabetes, 2012 Claude Bernard Award
Patrick Gullane	Royal College of Surgeons of Ireland, Honorary Fellow
Molly Shoichet	Society for Biomaterials, Clemson Award for Contributions to the Literature
Andres Lozano	Society of Brain Mapping and Therapeutics, Pioneer in Medicine Award

### EDUCATION

Brian Hodges	National Board of Medical Examiners, 2012 John P. Hubbard Award
Robin Mason	Nursing Network on Violence Against Women, Excellence in Education Award

### OTHER

Keith L. Moore	Ohio State University, Honorary Doctor of Science
Steven Narod	Pomeranian Medical University (Poland), Honorary Degree
Mladen Vranic	University of Zagreb, Honorary Doctorate
Bart Harvey	American Medical Writers Association, Eric W. Martin Award for Excellence in Medical Writing
Robert Buckman	American Medical Writers Association, Medical Book Award 2011 (Physicians category)
Izzeldin Abuelaish	Lombardy Region Peace Prize 2011; Calabria Peace Prize; Christopher Award in the "Books for Adults" category; Top 500 Most Influential Muslims in the World – Royal Islamic Strategic Studies Centre; Tufts University, Dr. Jean Mayer Global Citizenship Award

## NATIONAL AWARDS

### RESEARCH

Anthony Lang	Royal Society of Canada, Fellow
James Rutka	Royal Society of Canada, Fellow
Frank Sicheri	Royal Society of Canada, Fellow
Peter Singer	Order of Canada, Officer
Arnold Aberman	Order of Canada, Member
Samantha Nutt	Order of Canada, Member
Bernard Zinman	Order of Canada, Member
Shana Kelly	2011 Steacie Prize
Benjamin Blencowe	Natural Sciences and Engineering Research Council, 2011 John C. Polanyi Award
Brendan Frey	Natural Sciences and Engineering Research Council, 2011 John C. Polanyi Award
Vivek Goel	Canadian Academy of Health Sciences, Fellow
Patrick Gullane	Canadian Academy of Health Sciences, Fellow
Amira Klip	Canadian Academy of Health Sciences, Fellow
Anthony Lang	Canadian Academy of Health Sciences, Fellow
Ren-Ke Li	Canadian Academy of Health Sciences, Fellow
James Rutka	Canadian Academy of Health Sciences, Fellow

Stanley Zlotkin	Canadian Academy of Health Sciences, Fellow
Mary Jane Esplen	Canadian Association of Psychosocial Oncology, 2011 Lifetime Achievement Award
Gary Rodin	Canadian Association of Psychosocial Oncology, 2012 Lifetime Achievement Award
Peter Liu	Canadian Cardiovascular Society, 2011 Annual Achievement Award
John Floras	Canadian Cardiovascular Society, Research Achievement Award
George Steiner	Canadian Diabetes Association, Lifetime Achievement Award
Barry Goldlist	Canadian Geriatrics Society, 2011 Ronald Cape Distinguished Service Award
Leslie Levin	Canadian Health Services Research Foundation (CHSRF), Excellence through Evidence Award
Andreas Laupacis	Canadian Health Services Research Foundation Health Services, 2011 Health Services Research Advancement Award
Daniel Drucker	Canadian Institutes of Health Research (CIHR) and the Canadian Medical Association Journal (CMAJ), Top Achievements in Health Research Awards
Gideon Koren	Canadian Institutes of Health Research (CIHR) and the Canadian Medical Association Journal (CMAJ), Top Achievements in Health Research Awards
John Dirks	Canadian Medical Hall of Fame, Inductee
Lap-Chee Tsui	Canadian Medical Hall of Fame, Inductee
J.J.R. Macleod	Canadian Medical Hall of Fame, Posthumous Inductee
Sonia N. Yeung	Royal College Medal Award (Surgery), Royal College of Physicians and Surgeons of Canada
John Murnaghan	Royal College/AMS Donald Richards Wilson Award, Royal College of Physicians and Surgeons of Canada
Julio C. Furlan	Canadian Neurology Society, Francis McNaughton Memorial Prize
Avrum Gotlieb	Society for Cardiovascular Pathology, Distinguished Achievement Award
Laszlo Endrenyi	Canadian Society for Pharmaceutical Sciences, Fellow
Ed Cole	Canadian Society of Transplantation, 2012 Lifetime Achievement Award
Aaron Schimmer	Canadian Stem Cell Network, 2012 Till & McCulloch Award
Norman Rosenblum	Kidney Foundation of Canada, Medal for Research Excellence
Peter Liu	CIHR Institute for Circulatory and Respiratory Health, 2012 Distinguished Lectureship in Cardiovascular Sciences
Gary Bloch	College of Family Physicians of Canada, CFPC/OCFP 2011 Award of Excellence
Sandy Buchman	College of Family Physicians of Canada, CFPC/OCFP 2011 Award of Excellence
Charlie Guiang	College of Family Physicians of Canada, Mimi Divinsky Award for History and Narrative in Family Medicine
Mary L'Abbé	Hypertension Canada, Certificate of Excellence 2011; McGill University, E.W. Crampton Award
Jan Andrysek	Grand Challenges Canada, Rising Stars in Global Health
Helen Dimaras	Grand Challenges Canada, Rising Stars in Global Health
Ophira Ginsburg	Grand Challenges Canada, Rising Stars in Global Health

## EDUCATION

Susan Lieff	Association of Faculties of Medicine of Canada, 2012 Award for Outstanding Contribution to Faculty Development in Canada
Brian Hodges	Association of Faculties of Medicine of Canada, President's Award for Exemplary National Leadership in Academic Medicine
Mary Ellen Cooke	Canadian Anesthesiologists' Society, 2012 Clinical Teacher Award
Brian Hodges	Canadian Association for Medical Education, 2012 Ian Hart Award for Distinguished Contribution to Medical Education
Debra Elman	Canadian Association for Medical Education, Certificate of Merit Award 2012
Jamie Meuser	Canadian Association for Medical Education, Certificate of Merit Award 2012
Brian Wong	Canadian Association for Medical Education, Certificate of Merit Award 2012
Office of CEPD	Royal College of Physicians and Surgeons of Canada, Accredited CPD Provider Innovation Awards

## OTHER

David Goldbloom	Queen Elizabeth II Diamond Jubilee Medal
Izzeldin Abuelaish	2012 Calgary Peace Prize
Jennifer Blake	Top 25 Women of Influence Award 2011
Robert S. Bell	Canadian Public Relations Society, 2011–12 CEO Award of Excellence in Public Relations

# FACULTY AWARDS AND HONOURS 2011–2012

## PROVINCIAL AWARDS

### RESEARCH

Anna Banerji	Order of Ontario
Sandra Black	Order of Ontario
Louis Siminovitch	Order of Ontario
Charles Tator	College of Physicians and Surgeons of Ontario, Council Award
Sarah Ali-Khan	Ontario Genomics Institute, Societal Impact of Genomics Prize
Abdallah S. Daar	Ontario Genomics Institute, Societal Impact of Genomics Prize
Jeffrey Hurwitz	Ontario Medical Association, Ophthalmology Lifetime Achievement Award
Alex Jadad	Skills for Change, Pioneer for Change Award

### EDUCATION

Jane Philpott	Community Service Award, Schulich School of Medicine and Dentistry, Western University
Joshua Tepper	Ontario College of Family Physicians, 2011 Jan Kasperski Award
Philip Hébert	Ontario College of Family Physicians, Reg L. Perkin Family Physician of the Year Award
Martin Schreiber	Ontario Confederation of University Faculty Associations (OCUFA) Teaching and Academic Librarianship Awards; Ontario Medical Association, 2012 Advocate for Students Award
Vivek Goel	Honorary Diploma of Health Science, Michener Institute for Applied Health Sciences
Yashesh Patel	Professional Association of Interns & Residents of Ontario, PAIRO Excellence in Clinical Teaching Award 2011
Nancy Kazarian	Professional Association of Interns & Residents of Ontario, PAIRO Excellence in Clinical Teaching Award 2011
Michael Ward	Professional Association of Interns & Residents of Ontario, PAIRO Excellence in Clinical Teaching Award 2012
Eric Yu	Professional Association of Interns & Residents of Ontario, PAIRO Excellence in Clinical Teaching Award 2012

### OTHER

Pauline Pariser	Ontario College of Family Physicians, Family Practice of the Year Award
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## U OF T AWARDS

Lewis Kay	University Professor
Ivan Silver	President's Teaching Award
Mladen Vranic	Honorary Doctorate

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# U of T MEDICINE



UNIVERSITY OF TORONTO  
FACULTY OF MEDICINE