Welcome to the UHN Research Report 2007:
Regenerating Knowledge

University Health Network is Canada's premier research hospital and an affiliate of the University of Toronto.

Our vision is to have global impact in biomedical and health care research.

UHN Research comprises three research institutes: Ontario Cancer Institute (including Advanced Medical Discovery Institute and The Campbell Family Institute for Breast Cancer Research), at Princess Margaret Hospital; Toronto General Research Institute, at Toronto General Hospital; and Krembil Research Institute, at Toronto Western Hospital.

This year our Research Report focuses on our successes in regenerative medicine. Regenerative medicine is a compelling field of research that promises new treatments for some of the most devastating human diseases. And UHN is leading the way.
UHN Transforms Regenerative Medicine

UHN's purpose statement is, “We are a caring, creative and accountable academic hospital, transforming health care for our patients, our community and the world”.

One type of transformative health care is regenerative medicine. It offers the promise of dramatically changing current medical practice and improving the lives of millions worldwide. UHN investigators, working with UHN clinicians, staff and trainees, are at the forefront of this new field.

Our regenerative medicine initiatives are one reason why UHN is a leader among research hospitals. Please read on to learn more.

Dr. Robert S. Bell
President and CEO
University Health Network

Message from the VP
UHN Invests in New Ways of Healing

This past year has been a year of tremendous growth and development of the UHN research enterprise.

We've welcomed new OCI Director Dr. Ben Neel to our leadership team. We've received $49M in new infrastructure funding towards the creation of five new research centres across UHN. We've seen additional institutions join our new Shanghai-Toronto Institute for Health Research.

But a major focus this year has been the dramatic expansion of our regenerative medicine program.

Regenerative medicine seeks to utilize the body's own cells in developing treatments for disease. A field which is in early stages, it has the potential to transform the lives of millions afflicted by numerous diseases, such as stroke, diabetes, rheumatoid arthritis, spinal cord injury, and Parkinson's disease.

Regenerative medicine constitutes one of UHN's research priority platforms and has been the focus of substantial investment of resources.

2006/07 saw several developments that further signified UHN's commitment to this area.

The McEwen Centre for Regenerative Medicine, generously funded by donors Rob and Cheryl McEwen, was launched last October, becoming UHN's official hub for regenerative medicine discoveries. Director Gordon Keller has overseen the opening of the centre, providing strong intellectual leadership in the field and creating a diverse, multi-institutional research team.

Two large RM initiatives—a cancer stem cell centre and a
regenerative medicine program spanning cell therapy, gene therapy and tissue engineering—won nearly $23 million in government funding.

Regenerative medicine offers the promise of transforming current medical practice, and in these new initiatives UHN researchers are working to bring this dream to fruition. Together—UHN researchers, support staff, our Foundations and our colleagues from the University of Toronto and other Toronto Academic Health Science Network institutions—we are generating the innovations that will make this dream a reality.

Dr. Christopher J. Paige
Vice-President, Research
University Health Network

Victor Dzau, MD
President & CEO, Duke University Health System
The Chancellor for Health Affairs
Duke University Medical Center

Ralph Steinman, MD
Henry G. Kunkel Professor and Senior Physician
Rockefeller University

Hans Wigzell, MD, PhD
Professor, Microbiology and Tumor Biology Center
Karolinska Institute
2007 Statistics

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**Our Scientists and Clinical Research Staff**

**OCI Scientists**

**Applied Molecular Oncology**

- **Senior Scientists**
  - Asa, Sylvia
  - Bristow, Robert
  - Ezzat, Shereen
  - Gallie, Brenda
  - Hedley, David
  - Hill, Richard
  - Kamel-Reid, Suzanne

- **Scientists**
  - Done, Susan
  - Martin, Lisa

**Biophysics & Bioimaging**

- **Senior Scientists**
  - Chakrabartty, Avijit
  - Hunt, John
  - Jaffray, David
  - Sherar, Michael

- **Scientists**
  - Done, Susan
  - Martin, Lisa

**Cancer Genomics & Proteomics**

- **Senior Scientists**
  - Arrowsmith, Cheryl
  - Gariépy, Jean
  - Pai, Emil

- **Scientists**
  - Done, Susan
  - Martin, Lisa

**Behavioural Sciences & Health**

**Senior Scientists**

- Flint, Alastair
- Kaplan, Allan
- Kaz, John
- Carter, Jacqueline
- Jones, Jennifer
- Abbey, Susan
- Baker, Brian
- Colton, Patricia
- Davis, Caroline
- Grace, Sherry
- Hall, Peter
- Heslegrave, Ron

**Scientists**

- Liu, Fei-Fei
- Moore, Malcolm
- Squire, Jeremy
- Tannock, Ian
- Tsao, Ming-Sound
- Hodges, Brian
- Irvine, Jane
- McVey, Gail
- Reid, Graham
- Robinson, Gail
- Woodside, Blake

**Cellular & Molecular Biology**

**Senior Scientists**

- Backx, Peter
- Berger, Stuart
- Cardella, Carl
- Cybulsky, Myron
- Dick, John
- Elsholtz, Harry
- Fantus, George
- Fish, Eleanor
- Gorczyński, Reginald
- Gotlieb, Avrum

**Scientists**

- Cattral, Mark
- Husain, Mansoor
- Inman, Robert
- Jia, Tianru
- Kucharczyk, Walter

**Brain, Imaging & Behaviour—Systems Neuroscience**

**Senior Scientists**

- Brotchie, Jonathan
- Che, Robert
- Davis, Karen
- Lozano, Andres

**Sciences**

- Tator, Charles

**Fundamental Neurobiology**

**Senior Scientists**

- Broussard, Tymianski
- Carlen, Peter
- Skinner, Frances

**Scientists**

- Sugita, Shuzo

**Genetics & Development**

**Senior Scientists**

- Barr, Cathy
- Bremner, Rod
- Cardella, Carl
- Eubanks, James
- Fehlings, Michael
- Inman, Robert
- Jongstra, Jan

**Scientists**

- Monnier, Philippe

**Health Care & Outcomes Research**

**Senior Scientists**

- Bard, Cathy
- Bremner, Rod
- Cardella, Carl
- Eubanks, James
- Fehlings, Michael
- Inman, Robert
- Jongstra, Jan

**Affiliate Scientists**

- Guha, Abhijit
### Senior Scientists
- Devins, Gerald
- Galgilese, Lucia

### Scientists
- Edelstein, Kim
- Howell, Doris
- Manoukian, Armen

### Affiliate Scientists
- Esplen, Mary Jane

### Signaling Biology
#### Senior Scientists
- Ikura, Mitsu
- Khokha, Rama

#### Scientists
- Cheung, Peter
- Hakem, Razqallah
- Jurisica, Igor

#### Stem Cells & Developmental Biology
- Barber, Dwayne
- Iscove, Norman
- Keller, Gordon

#### OCI Clinical Research Unit
- Bayley, Andrew
- Bell, Bob
- Bezjak, Andrea

#### Members
- Chou, John
- Chung, Peter
- Crook, Juanita
- Croul, Sidney
- Crump, Michael

### Experimental Therapeutics
#### Senior Scientists
- Keating, Armand
- Kelvin, David
- Keshavjee, Shaf
- Li, Ren-Ke

#### Scientists
- de Perrot, Marc
- Nanthakumar, Kumar

### Genomic Medicine
#### Affiliate Scientists
- Fagin, Todd
- Fong, Shun

### Patient Based Clinical Research
#### Senior Scientists
- Diamant, Nicholas
- Heathcote, Jenny

#### Scientists
- Grove, Colin
- Sharpe, James

### Visual Science
#### Senior Scientists
- Planagan, John
- Steinback, Martin

#### Scientists
- Hudson, Wong
- Christopher

### Krembil Clinical Studies Resource Centre (CRSC)
#### Members
- Anastakis, Dimitri
- Bernstein, Mark
- Bookman, Arthur

#### Scientists
- Terbrugge, Karel
- Tarlo, Susan
- Matthew

#### Patient Based Clinical Research
- Provost, David
- Zehnder, John

#### Scientists
- van Boxtel, Hans
- Zehnder, John
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**TGRI Clinical Studies Resource Centre (CSRC)**

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Gospodarowicz, Mary
Greig, Paul
Gryfe, Robert
Hodgson, David
Irish, Jonathan
Jewett, Michael
Johnston, Michael
Jones, Jennifer
Kane, Gabrielle
Keating, Armand
Keshavjee, Shaf
Kim, John
Knox, Jennifer
Krzyzanowska, Monika

Frances Simpson, Rand
Siu, Lillian
Sturgeon, Jeremy
Sun, Alexander
Sutherland, Robert
Swallow, Carol
Sweet, Joan
Tkachuk, Douglas
Trachtenberg, John
Tsang, Richard
van der Kwast, Theodorus
Waddell, Thomas
Waldron, John
Warde, Padraig
Warr, David
Wei, Alice
Wells, Woodrow
Wong, Rebecca
Year In Review

New OCI Leadership Announced
June 2006: Dr. Benjamin Neel—world-renowned cell signaling researcher, Director of the Cancer Biology program at Boston’s Beth Israel Deaconess Medical Centre and Professor of Medicine at Harvard Medical School—was recruited as new Director of OCI. Dr. Neel took up his position in January 2007.

New Regenerative Medicine Research Centre Opens Doors
October 2006: The opening of the new McEwen Centre for Regenerative Medicine was marked with a scientific symposium of internationally-recognized stem cell researchers. Singer/philanthropist Sir Bob Geldof and lead donors Rob and Cheryl McEwen led the celebrations.

Research Day a Success
November 2006: More than 400 UHN researchers took part in UHN's annual Research Day. The event showcased 20 talks and 130 poster presentations spanning the range of biomedical investigation at UHN.

Researchers Set $49M Funding Record
November 2006: Drs. Pamela Catton, John Dick, Igor Jurisica, Kathy Siminovitch and Richard Weisel won $28 million in funding from the Canada Foundation for Innovation (CFI), the highest amount ever awarded by the CFI to UHN in a single round. In April 2007, the Ontario Research Fund made additional awards, bringing the total to $49M for these projects.

UHN's International Research Advisory Board Visits
December 2006: UHN hosted our International Research Advisory Board members this month. During their visit, the group—Drs. Victor Dzau President & CEO, Duke University Health System), Ralph Steinman (Professor, Rockefeller University), Hans Wigzell (Professor, Karolinska Institute) and chair Philip Branton (Scientific Director, CIHR Institute of Cancer Research)—reviewed translational research initiatives at UHN and met with hospital and Foundation executives.

A further $10M donation from lead donors Rob and Cheryl McEwen raises their total commitment to their namesake centre to $20M.
Regenerative Medicine Supported at McEwen Centre
with $10M Gift
April 2007: A new donation from Rob and Cheryl McEwen will support groundbreaking stem cell research through imaging facilities, an embryonic stem cell laboratory, post-doctoral fellowships and programs designed to accelerate the development of scientific discoveries.

Development Acceleration Awardees Announced
September 2007: Four UHN researchers—Drs. David Jaffray, Lothar Lilge, Li Zhang and Gang Zheng—were awarded Development Acceleration Awards, a joint initiative between Johnson & Johnson and UHN. The award provides funding for development of imaging technologies in the context of neoplastic, cardiovascular, autoimmune, infectious, and/or neurological disease.
Leukemia: New Model Shows Human Disease Back to Its "Big Bang"

Cancer researchers led by OCI's Dr. John Dick have developed a method to convert normal human blood cells into "human" leukemia stem cells. The converted cells, when transplanted into special mice that permit the growth of human cells, can replicate the entire disease process from the very moment it begins.

Explains Dr. Dick: "Most human leukemia research involves studying a patient's diseased cells or a cell line grown from those cells. However, since cancer takes many months or years to develop, just studying the cells at the end of the process does not let you know what the series of changes were that caused the cells to become leukemic, and when they happened.

"With the method we developed, we have duplicated the natural process every step of the way. It opens the pathway generally to understanding the process of how cancer begins."

Science. 2007 Apr 27; 316(5824):600-4. [ Abstract ]

Cancer: Anti-Aging Molecule May Help in Cancer Fight

A UHN research team led by Dr. Tak Mak discovered that a molecule that helps extend the lifespan of flies and worms may also help protect against cancer.

FOXO3a, a member of a family of molecules that helps regulate anti-aging gene activity, was found to be capable of making cells self-destruct via a process that relies on the tumour suppressor molecule p53.

The researchers found that FOXO3a has a paradoxical role: If it is turned on in the cell's nucleus, it stops p53 from working; however, outside of the nucleus, it can do the opposite—actively inducing p53-dependent programmed cell death.

"Interestingly, FOXO3a could trigger programmed cell death even in situations where p53 has lost its ability to work directly with DNA," says Dr. Mak. "Pinpointing FOXO3a's involvement in programmed cell death gives researchers a new target for future anticancer therapies."


Pancreatic Cancer: Combination Therapy Offers Promises

A new combination therapy has been demonstrated to prolong survival time in people with advanced pancreatic cancer, according to UHN researchers Dr. Malcolm Moore and Steven Gallinger. The new approach uses the compound erlotinib to target specific pathways overproduced in pancreatic cancer.

The two-year UHN-led National Cancer Institute of Canada Clinical Trials Group study followed 569 patients treated with either gemcitabine— the current treatment standard—alone or in combination with erlotinib. Patients who received the combination...
**Leukemia: Fusion Protein Structure Reveals Potential Target**

Dr. Mitsu Ikura and postdoctoral fellow Dr. Michael Plevin have revealed the three-dimensional solution structure of the TAFH domain—a domain critical for E protein interactions—of the AML1-ETO fusion protein using NMR spectroscopy.

AML1-ETO is generated by a translocation between chromosomes 8 and 21, an event that occurs in up to 15% of acute myeloid leukemias (AML). AML1-ETO can silence E protein activation of transcription factors that are involved in regulating cell growth, differentiation and apoptosis. By mutating AML1-ETO, this activity is reduced.

"Resolving the structure of protein domains and doing mutational analysis is key to understanding protein function," says Dr. Ikura. "This domain of AML1-ETO showed a surprising similarity to another cancer gene regulator Sin3. Our findings help us to obtain deeper insights into leukemia and to design chemical inhibitors based on similarities and differences in their protein structures."


**Acute Myeloid Leukemia: Understanding Fatigue**

A UHN study by researchers Drs. Shabbir Alibhai, George Tomlinson, Joseph Brandwein, Mark Minden and Matthew Kowgier and Mr. Marc Leach is the first to investigate fatigue associated with acute myeloid leukemia (AML) in detail. AML—a cancer of the blood—is more common in adults 60 years and older and has a significant effect on a patient's quality of life.

Patients were studied to characterize the prevalence and severity of fatigue. Study authors show that fatigue was universal for all patients throughout the study regardless of treatment therapy with 98% having reported fatigue.

"Fatigue has a significant effect on a patient's quality of life, so getting to the bottom is key," says Dr. Alibhai. "Our next steps are to dig deeper into causes of fatigue, and whether chemotherapy or improved disease control impact on fatigue and design interventions to alleviate fatigue."

Acute Respiratory Distress Syndrome: Study Shows Long-Term Outcomes for Survivors

A recent study by UHN researchers Drs. Angela Cheung, Margaret Herridge and George Tomlinson established that most survivors of acute respiratory distress syndrome (ARDS) have a reduced health-related quality of life two years after being discharged from an intensive care facility. ARDS is a serious illness where fluid accumulates in the lungs, which causes oxygen levels in the blood to drop to dangerously low levels.

The researchers followed 109 ARDS survivors for two years to examine changes in the quality of life and associated healthcare costs. They found that all health-related quality of life domains, other than emotional and mental health, were diminished compared to those of the general population. However, most ARDS survivors adapted to their situation and could live independently and return to work.

"Our findings suggest that future research efforts should concentrate on early intensive rehabilitation programs for ARDS," says Dr. Cheung. "These types of programs could help improve the long term outcomes for ARDS survivors."

Heart Attack: Bone Marrow Molecule Signals Repair "Troops"

UHN regenerative medicine researchers Drs. Shafie Fazel, Massimo Cimini, Liwen Chen, Shuhong Li, Denis Angoulvant, Paul Fedak, Richard Weisel, Armand Keating and Ren-Ke Li have identified the SOS distress signal that mobilizes specific repair cells to the heart after a heart attack.

C-kit, a molecule located on the surface of a subset of bone marrow cells, is turned on by the SOS signals sent by the damaged heart. C-kit binds to another molecule, activating c-kit to signal bone marrow cells to home in on the heart to help stimulate new blood vessel growth.

"Each year, 70,000 Canadians suffer from a heart attack and many of them are left with crushing disabilities, mainly because the heart muscle is not able to regenerate after a heart attack," says Dr. Li. "This study identifies how the body naturally repairs the heart and provides new potential therapies to stimulate cardiac regeneration and prevent heart failure in these patients."

Digestive System Diseases: Defining Treatment Criteria for Swallowing Disorder

Patients with the rare swallowing disorder achalasia are unable to relax the muscular ring that links the esophagus to the stomach. They experience difficulty swallowing and moving food from their
mouth to their stomach through their esophagus—sometimes leading to pain, regurgitation and dangerous weight loss.

There are two common surgical treatments for achalasia; however, it is not clear which treatment is less likely to result in the need for subsequent interventions. To address the controversy, UHN health services researcher Dr. David Urbach performed a retrospective study using data records from 1461 achalasia patients in Ontario.

“Our study shows that although both methods commonly result in the need for subsequent intervention, less than 40% of patients treated with surgical dissection of the muscle had to be treated again compared to more than 60% of patients treated by enlarging the contracted opening using an air-filled balloon,” says Dr. Urbach.

“Knowing that surgical dissection is slightly more efficient overall, we suggest that doctors consider the patient’s attitude toward surgical procedures and the desire to avoid further treatments when making recommendations.”

JAMA. 2006 Nov 8;296(18):2227-33. [Abstract]

Heart Failure: Knowing the Signs
A recent UHN-led study provides insight into the series of events involved in heart failure, the fastest growing epidemic in cardiovascular disease, the number one killer of Canadians. Drs. Peter Liu, Thomas Parker and Rama Khokha have determined the importance of tumor necrosis factor alpha (TNFa)—usually involved in many cell processes such as growth and survival—in regulating cardiac repair and remodeling.

Using a mouse model, researchers compared the effects of pressure load on the left ventricle of the heart in the presence and absence of TNFa. In the presence of TNFa, pressure-overloaded cardiac cells are riddled with high levels of inflammatory proteins, leading to heart dilation, and the cells eventually succumb to TNF effects, contributing to cardiac dysfunction.

When TNFa was removed, adverse heart effects were reduced. “Based on this effect, TNFa could be used to alert physicians when heart repair processes threaten to deteriorate into heart failure,” says Dr. Liu. “Even more exciting is its potential as a therapeutic tool in the treatment of patients. We stumbled upon this finding quite unexpectedly, and were surprised at its absolutely potent effect.”


Liver Transplant: Showing the Benefits of Live Donation
TGH has been a world leader in liver transplants involving living donors, and a recent study has proven the beneficial effects of this treatment strategy. Living donation allows suitable recipients to avoid the long organ waiting list but may represent unknown immediate and long-term health risks given that recipients receive only part of a liver.

To compare the risks of being on the list to those of receiving a living donation, UHN researchers Drs. David Grant, Gary Levy, Paul Greig, Ian McGilvray, Leslie Lilly, Nigel Girgrah and Mark Cattral reviewed survival rates and mortality of patients in the liver transplant program.

They found that patients who received a right-lobe of a liver from a living donor had a higher survival rate post-transplant and reduced mortality on the waiting list than those who received a transplant from a deceased donor.

Says study leader Dr. Grant: “Live donor transplants significantly shorten wait times and reduce the chance of death for those patients who are on waiting lists. We have shown that we are able to help
patients quicker and more effectively with live donation. Future studies will have longer follow-up times to more clearly understand the advantages and disadvantages of living donors."

Arthritis: Predicting Probability of Joint Replacement Surgery

The need for improved patient education of people with arthritis is highlighted in new work by UHN researcher Dr. Elizabeth Badley, Dr. Gillian Hawker (Women’s College Hospital) and other Toronto-based researchers who looked at factors underlying a patient’s decision to undergo joint replacement surgery.

In a prospective study, the researchers recorded information about 3,307 seniors who were experiencing symptoms of arthritis in 1995-1997. In 1999, the researchers followed up with 2,103 respondents and found that—out of factors including education level, height, weight, socioeconomic factors, employment and living arrangements—the most important determining factor was willingness to have the surgery.

"Joint replacement surgery is a cost-effective treatment for debilitating arthritis of the hip and knee, and disparities in rates of surgery are troubling. Willingness to consider surgery as a treatment option results from improved patient understanding. This underlines the fact that we need to continue to develop and implement strategies to educate the community about arthritis and replacement surgery outcomes," says Dr. Badley.

Brain Injury: Research at the Forefront of New Therapies

A new UHN finding is the first step towards developing new multi-pronged strategies for traumatic brain injury (TBI).

Damage to a brain cell sets off a cascade of internal and external events that combine to create a toxic environment, killing neighbouring cells over a large area. While neuroscientists are starting to understand this complex mechanism, treatments which address a single component of the cascade have proven unsuccessful in clinical trials. Thus researchers are moving to a multi-pronged paradigm to address two or more components simultaneously.

A pioneering study led by Dr. Michael Tymianski and graduate student Anthony Lau has shown that due to the effects of a lethal by-product of cell damage called peroxynitrate, TBI therapy should include both anti-oxidant and anti-apoptotic compounds.

“If we can use molecular approaches to prevent the oxidizing process, which forms hazardous reactive oxygen molecules in the brain, and the apoptosis process, which leads to programmed cell death, we may be able to reduce cell death in these injuries,” explains Dr. Tymianski.

Degenerative Disc Disease: Notochord Cells Help to Regenerate Disc Cartilage

Drs. Mark Erwin and Robert Inman have discovered that notochord cells...
cells—which are primitive organizing cells of the developing embryo—release a factor called connective tissue growth factor (CTGF) that may be responsible for providing certain strains of dogs with their remarkable resistance to degenerative disc disease.

Degenerative disc disease is one of today's most common and costly medical conditions, marked by a progressive loss of disc height, mechanical properties and tissue degradation. However, in resistant dog strains it does not occur or occurs much later in life.

To find out why resistant dogs are protected, the UHN team obtained notochord cells from the discs of the dogs and determined the identity of some of the proteins secreted by these cells. They then used the proteins secreted by these cells to determine what disc cell genes are turned on by these notochord cells.

“Our results suggest that certain breeds of dogs are protected against this disease because their discs contain an abundance of notochord cells that are releasing CTGF,” says Dr. Inman. “This research will likely provide the groundwork to regenerate disc cartilage for patient treatment in the future.”


### Spinal Cord Injury: Rebuilding from the Ground Up

A team led by Krembil researcher Dr. Michael Fehlings has demonstrated a new way to reconstruct an essential element in nerve function in the spinal cord in a paper jointly co-first authored by Drs. Eftekhar Eftekharpour and Soheila Karimi.

A tissue called myelin functions as an insulating casing around nerve fibers and takes part in conducting signals from the brain to the rest of the body. After transplanting specific neural precursor cells (aNPCs) from the brain of adult transgenic mice into the spinal cords of mice which lack myelin, investigators were able to generate oligodendrocytes—the building blocks of myelin—which traveled down the spinal cord and formed mature myelin.

“This is a major step forward in spinal cord injury research,” says Dr. Fehlings. “The ability to restore the myelin insulation is a key component of a therapeutic strategy, and our study is the first to show this exciting result. Our future work will focus on generating neural precursor cells from alternative sources including embryonic stem cells and in applying this technology is concert with tissue engineering approaches to repair chronic spinal cord injury.”

Honour Roll

In 2006/07, UHN researchers were recognized by peers around the world for their achievements:

**Dr. Frances Shepherd**  
O. Harold Warwick Prize for significantly impacting cancer control in Canada, awarded by the National Cancer Institute of Canada

**Dr. Pamela Ohashi**  
Elected to the Royal Society of Canada

**Dr. Robert Inman**  
Jonas Salk Award for making a new and outstanding contribution to prevent, alleviate or eliminate a physical disability, awarded by the Ontario March of Dimes

**Drs. Vivek Rao and Aaron Schimmer**  
Canada’s “Top 40 Under 40”

**Drs. Conrad Liles, Gordon Keller, Benjamin Neel, Eleanor Fish and Linda Penn**  
Canada Research Chairs, Tier I

**Drs. Igor Jurisica, Thomas Kislinger, Shuzo Sugita and Elisabeth Tillier**  
Canada Research Chairs, Tier II

**Dr. Brian Wilson**  
Lifetime Achievement Award, Optical Imaging Workshop, National Institutes of Health (U.S.)

**Dr. George Steiner**  
Named a Distinguished Fellow of the International Atherosclerosis Society

**Dr. Peter St George-Hyslop**  
Howard Hughes Medical Institute International Research Scholar Award

**Drs. John Dick, Tak Mak and Peter St George-Hyslop**  
UHN researchers swept three of the four inaugural Premier’s Summit Awards awarded at a gala ceremony in April 2007. Drs. John Dick, Tak Mak and Peter St George-Hyslop will each receive $2,500,000 towards new research projects

**Drs. Brenda Gallie, Ernest McCulloch and James Till**  
Three UHN researchers were invested into the Order of Ontario in 2006. Drs. Brenda Gallie, Ernest McCulloch and James Till received the province's highest official honour for excellence and outstanding contribution to society in Ontario and around the world.
CFI Grants Boost Funding
Support for Groundbreaking Research across UHN's Programs

2006/07 marked a record year for UHN in CFI grant funding earned. A round earned five UHN research teams a collective total of $21.4M in new infrastructure funding and $6.4M in operating funding—a UHN record. Later this year, projects were awarded an additional $21.4M through the Ontario Research Infrastructure program, resulting in a funding total of over $49M for these five projects.

The awards fund a variety of projects across UHN’s priority research areas.

Regenerative Medicine Scores Twin Wins
Regenerative medicine is one of UHN’s research priority platforms, and one of its flagship programs is the new Regenerative Medicine (REMEDI) Project, recently funded by CFI, which provided $7.2M in funding. This new centre will comprise cutting-edge multi-imaging infrastructure with multi-dimensional visualization. Led by Dr. Richard Weisel, this project drives regenerative medicine research to clinical applications for a variety of diseases.

"REMEDI is an innovative approach to regenerative medicine," Dr. Weisel explains. "It is a multidisciplinary initiative, which will enable innovative and customized research technologies to facilitate investigations intended to provide new regenerative therapies including: labeling, imaging, visualization and guided delivery. The project will unite experts from numerous fields: engineers, computer scientists, molecular biologists and clinicians to find unique new treatments to restore function to diseased organs. Ultimately, the vision of regenerative medicine research will be to provide cutting-edge therapeutic tools to improve the health of Canadians."

Another project within the regenerative medicine platform is Dr. John Dick's new Cancer Stem Cell Centre. This project, which secured over $4M in CFI funding, focuses on developing cancer stem cell therapies. It consists of several core activities including live cell banking, xenotransplanting, flow cytometry, high throughput screening and imaging. As a result, it will enable cancer stem cell scientists to develop improved predictive diagnostic and prognostic tests, as well as pursue new cancer therapies.

Genomics, Systems Biology and Survivorship Research Also Winners
Also receiving CFI funding this year was Dr. Katherine Siminovitch’s Disease Genomics: Reduction to Practice. This $4.8M proposal, aligned with UHN research’s priority platform in Genes, Proteins and People, builds on UHN's Clinical Genomics Centre, a state-of-the-art genomics and proteomics technology platform. The development of profiling tools and new medications are among the outcomes that ultimately lead to improved patient management.

CFI Grants Awarded at UHN, 2007

<table>
<thead>
<tr>
<th>Research Area</th>
<th>Award Amount</th>
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<tbody>
<tr>
<td>Regenerative Medicine (REMEDI) Project</td>
<td>$7.2M</td>
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<tr>
<td>Disease Genomics: Reduction to Practice</td>
<td>$4.8M</td>
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<td>Cancer Stem Cell Centre</td>
<td>$4.3M</td>
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<tr>
<td>Comprehensive Systems Biology Approach to Profiling</td>
<td>$4.0M</td>
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<td>and Modeling of Cancer</td>
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<tr>
<td>Electronic Living Laboratory for Interdisciplinary</td>
<td>$1.2M</td>
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<tr>
<td>Cancer Survivorship Research</td>
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<tr>
<td>Total Funding</td>
<td>$21.5M</td>
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Dr. Igor Jurisica's Comprehensive Systems Biology Approach to Profiling and Modeling of Cancer received over $4M from CFI. This project, which enables the interdisciplinary, integrated and collaborative profiling and modeling of cancer, is aligned with two of UHN research's priority platforms—Genes, Proteins and People, and Health Informatics. Through this endeavour, researchers aim to understand cancer at a molecular level, which can lead to a number of benefits: improvement in the quality and cost of cancer diagnosis and treatment via intelligent molecular medicine, the identification of novel and more specifically targeted drugs, as well as increased efficiency of current therapies.

The Electronic Living Laboratory for Interdisciplinary Cancer Survivorship Research, an innovative new approach to research in cancer, was awarded $1.2M in CFI funding. Headed by Dr. Pamela Catton, this initiative leverages the intellectual capital of cancer survivors to examine new approaches to predict, prevent and manage long-term adverse effects of cancer and its treatment. Through examining social networks and competency building, distributed models of care, health knowledge transfer and sustainability, innovative research into chronic disease health care delivery—using cancer survivorship as a model—will be performed.
McEwen Centre Launches
Leading the Way in Regenerative Medicine

Last year, stem cell research took a large step forward with the opening of the McEwen Centre for Regenerative Medicine at UHN.

UHN Celebrates with Scientific Symposium
More than 300 members of the scientific community attended the scientific symposium which launched the festivities. Centre Director Dr. Gordon Keller, an internationally acclaimed embryonic stem cell scientist and co-chair of the symposium, was also officially introduced to the Toronto research community.

World-renowned researchers—including Drs. John Dick, Rudiger von Harsdorf, Thomas Waddell, Michael Fehlings, Janet Rossant, Derek van der Kooy, and keynote speaker Dr. George Daley—described stem cells and their significance to various biomedical fields, showcasing their unique ability to change the face of medicine and health on numerous fronts.

Following the symposium, a tour of the facilities—with musician Sir Bob Geldof among the attendees—continued the celebration. The event ended with a gala reception and dinner hosted by philanthropists and lead donors Robert and Cheryl McEwen.

Centre Focuses on Research & Commercialization
As a key component of UHN's regenerative medicine research priority platform, the Centre focuses on three specific areas: repair and regeneration, origins and models of disease and new tools for discovery. Heart disease, diabetes, blood cell disorders and spinal cord and neurodegenerative diseases are the core fields of investigation, while research in other diseases, including those of the lungs, as well as muscular/skeletal and gastro/intestinal conditions, will also be pursued.

In addition to establishing the Centre, which is located on the 8th floor of the Toronto Medical Discovery Tower, funding will allow regenerative medicine researchers from across UHN and across Toronto to attract new trainees through new postdoctoral fellowships as well as to pursue new modes of commercialization via enhanced support for this program.

"This is truly an exciting opportunity," says Dr. Keller. "There is an enormous pool of talented regenerative medicine researchers in Toronto. My goal as the Director of the McEwen Centre for Regenerative Medicine is to create an environment that will foster cross-disciplinary interactions and encourage investigators to work synergistically towards the development of innovative regenerative medicine approaches."
Research Funding Revenues

UHN Core Research Funding (in thousands of dollars)
- Princess Margaret Hospital Foundation: 15,341
- Toronto General & Western Hospital Foundation: 2,502
- Arthritis & Autoimmunity Research Centre Foundation: 1,259
- Ministry of Health & Long Term Care: 2,850
- Recoveries: 7,652
- Investment income: 2,814

Other: 13,213

TOTAL: 45,631

UHN External Research Funding (in thousands of dollars)
- Operating Grants: 74,719
- Infrastructure / Maintenance Awards: 24,339
- Clinical Studies: 17,997
- Other: 9,759
- Career / Traineeship Awards: 7,642
- Corporate Contracts: 7,225

TOTAL: 141,681

External Agencies Funding UHN Research

A-C
- Abbott Laboratories
- Advanced Cardiovascular Systems
- Advanced Neuromodulation Systems
- Aegera Therapeutics
- Agouron Pharma
- Albert Einstein College of Medicine of Yeshiva University
- Alberta Heritage Foundation for Medical Research
- Alexion Pharmaceuticals
- Allergan
- American Association for Thoracic Surgery
- American Association of Neurological Surgeons
- American Cyroscope Makers
- American Heart Association
- American Society of Plastic Surgeons' Plastic Surgery Educational Foundation
- American Society of Regional Anesthesia and Pain Medicine
- Amgen
- Amorfix Life Sciences
- Amyotrophic Lateral Sclerosis Society of Canada
- AOSpine North America
- ArgiNOx Pharmaceuticals
- Argonne National Laboratory
- Argos Therapeutics
- Arius Research
- Arthritis Community Research & Evaluation Unit
- Arthritis Society
- Aspreva
- AstraZeneca Canada
- AtheroGenics
- Atuka
- Aventis Pasteur
- Banting and Best Diabetes Centre
- Bausch and Lomb
- Baxter Healthcare
- Baycrest
- Bayer
- Beckman Coulter
- Bell Canada
- BioAxone Therapeutic
- BioChem Therapeutic
- BioMimetic Therapeutics
- Boehringer Ingelheim

D-L

M-O

P-Z

Full Listing
Major Sources of External Funding (in thousands of dollars)

Canadian Institutes of Health Research  24,653
Canada Foundation for Innovation/OTI  22,318
National Cancer Institute of Canada  7,275
National Institutes of Health (US)  6,843
Ontario Institute for Cancer Research  4,581
Heart and Stroke Foundations  3,973
Ontario Genomics Institute  2,726
Canada Research Chairs Program  2,556

All figures represent fiscal year 2006/07 and include Ontario Cancer Institute (Princess Margaret Hospital); Toronto General Research Institute (Toronto General Hospital); and Krembil Research Institute (Toronto Western Hospital).

These figures have been provided by UHN Research Financial Services and Research Grant and Contract Services. These figures have not been audited. However, they have been included in the overall UHN statements and, as a result, have been subjected to audit procedures deemed appropriate by auditors in order to determine their overall reasonableness.
# Committees

## Ontario Cancer Institute

### Animal Care Committee
- Richard Hill (Co-chair)
- Norman Iscove (Co-chair)
- Beryl Nash (Community Representative)
- Monica Bailey
- Shelley Belford
- Lih Ling Chung
- Jean Flanagan
- Tuula Kalliomaki
- Melissa Madden
- Badru Moloo
- Jeffrey Siewersden
- Elisabeth Tillier

### Research Appointments Committee
- Benjamin Neel (Chair)
- Mitsu Ikura
- Norman Iscove
- David Jaffray
- Fei-Fei Liu
- Mark Minden
- Gary Rodin
- Robert Rottapel

### Common Equipment Committee
- Gilbert Privé (Chair)
- Dwayne Barber
- Peter Cheung
- Tony Goncalves
- Richard Hill
- Janet Ma
- Ian McDermott
- Malcolm Smith
- Aaron Schimmer
- Alex Vitkin

### Clinical Research Unit Executive
- James Brierley
- Darlene Dale
- Gerald Devins
- Mary Gospodarowicz
- Jonathan Irish
- Armand Keating
- Michael Milosevic
- Martin O'Malley
- Tony Panzarella
- Patricia Shaw
- Frances Shepherd
- Padraig Warde

### Clinical Research Implementation Committee
- Andrea Afinec
- Lidia Casciaro
- Darlene Dale
- Jeffrey Doi
- Vicky Gillman
- Debbie Havill
- Karen Hersey
- Jennifer Hornby
- Azizinussa Irumnazz
- Jane Nagai
- Maria Oldfield
- Larissa Potanina
- Linda Purushuttam

### Data Safety Monitoring Board
- Jolie Ringash (Chair)
- Mark Minden (Co-chair)
- Dale Brown
- Jennifer Petronis
- Ex Officio Members
- Monica Phillips
- Larissa Potanina
- Di Wang
- Lisa Wang
- David Warr

### Biosafety Committee
- Jim Brunton (Chair)
- Eric Baillie
- Richard Bilan
- Tuyet Diep
- Ambrosio DiMagiba
- Ian McDermott
- Jeffrey Medin
- Badru Moloo
- John Shannon
- Jeffrey Medin
- Aaron Schimmer
- Zahir Hirji
- Jacqueline Tumak
- Joan Wither

### Radionuclide Safety Committee
- Ian McDermott (Co-chair)
- Frank Tourneur (Co-chair)
- Neil Amos
- Jonathan Brotchie
- Ron Burke>
- Lisa Colangelo
- Marc Freeman
- Judy Gabrys
- Scott Jarrett
- Ming-Der Yu

### Research Ethics Board (A)
- Ronald Heslegrave (Chair)
- Alan Barolet
- Derek Cathcart
- Steven Friedman
- Cindy Heinz
- Karen McRae
- Katherine Roposa
- Heather Sampson
- Ron Seto
- Elizabeth Sloss
- David Barth
- Judy Gabrys
- Linda Wright
- Allison Miculan

### Research Ethics Board (B)
- Ronald Heslegrave (Chair)
- Alan Barolet
- Derek Cathcart
- Steven Friedman
- Cindy Heinz
- Karen McRae
- Katherine Roposa
- Heather Sampson
- Ron Seto
- Margaret Hume
- Roger McIntyre
- Judith Miller
- Dheeraj Rajan
- Alex Kerr (Non-voting member)

### Research Ethics Board (C)
- Ronald Heslegrave (Chair)
- Anthony Brade
- Carol Ann Buckley
- Pavel Crystal
- Naomi Miller
- Jane Nagai
- Andre Schuh
- Donald Short
- Kittle Tomson

## Toronto General Research Institute

### Clinical Research Advisory Committee

## University Health Network Research Report 2007

http://www.uhnres.utoronto.ca/RR/committees.php
<table>
<thead>
<tr>
<th>Committee</th>
<th>Chair</th>
<th>Members</th>
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<tr>
<td>Basic Research Advisory Committee</td>
<td>Richard Weisel (Chair)</td>
<td>Gary Levy, Myron Cybulsky, Richard Weisel,</td>
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<td>Peter Liu, Ian McGilvray, A. Liu</td>
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<td>Research Appointments Committee</td>
<td>Shaf Keshavjee (Chair)</td>
<td>Christopher Paige, Peter Liu, Danilov, Li</td>
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<td>Zhang, Steven Liu</td>
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<td>MBRC Facilities Management Committee</td>
<td>Reginald Gorczynski (Chair)</td>
<td>Mingyao Liu, Fayez Dawood, Michelle Deeton,</td>
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<td>Tuyet Diep, David Irwin, David Irwin</td>
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<td>Krembil Research Institute</td>
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<td>Trainee Affairs Committee</td>
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<td>Research Information Systems User Group</td>
<td>Norman Iscove (Chair)</td>
<td>Brenda Gallie, Stuart Berger, Chip Campbell,</td>
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<td>Angela Cheung, Peter Cheung, Karen Davis,</td>
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<td>Cancer Registry and Data Access Committee</td>
<td>James Brierley (Co-chair)</td>
<td>Vikas Gupta, Darlene Dale (Co-chair)</td>
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<td>Monika Krzyzanowska, Alexandra Easson,</td>
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<td>Richard Hill, Michael Johnston, Patricia</td>
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<td>Human Tissue Committee</td>
<td>Ronald Hesegrave (Chair)</td>
<td>Jeremy Squire, Ming-Sound Tsao</td>
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<td>Ad Hoc Members</td>
<td>Sylvia Asa</td>
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<td>CReedit Advisory Committee</td>
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Note: This list includes the members of various committees within the University Health Network. The list is not exhaustive and includes chairs, co-chairs, and members. The committee names and their respective roles vary, covering research appointments, facilities management, research information systems, and more. Each committee has a chair and members listed, indicating their contributions to the respective areas of research and administration within the institution.
### Toronto General and Krembil Research Institutes

#### Animal Care Committee

<table>
<thead>
<tr>
<th>Name</th>
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<tr>
<td>Jeffrey Medin (Chair)</td>
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<td>Jan Jongstra (Vice-chair)</td>
<td>Melissa Madden</td>
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<td>Kathleen Cook (Community Representative)</td>
<td>Andrea McCart</td>
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<td>Shelley Belford</td>
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<td>Lih Ling Chung</td>
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