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## New Research Breakthroughs at UHN

### Bladder Cancer: Examining Surgical Treatment Decisions

A new finding by TGRi researcher Dr. [Shabbir Alibhai](#), OCI researchers Drs. [Antonio Finelli](#), [Neil Fleshner](#), [Michael Jewett](#) and doctoral student Dr. Girish Kulkarni will help high-risk bladder cancer patients make better informed decisions about treatment options.

Using a mathematical decision model, the research team analyzed and integrated results from previous studies and found that younger people with high-risk bladder cancer—regardless of sex—who opted for immediate cystectomy (removal of the bladder) had higher life expectancy and quality of life than people who chose a more conservative treatment.

Cystectomy can cause sexual, urinary, and gastrointestinal dysfunction. Thus, patients who place a high value on sexual function, gastrointestinal function or bladder retention or who are over the age of 70 may benefit from an initial conservative approach.

*PLoS Medicine*. Sept 2007 4(9): 1538-1549. [[Pubmed abstract](#)]. *Research supported by Canadian Institutes of Health Research and the National Cancer Institute of Canada.*

### Cardiology: Decreasing Cognitive Decline in Bypass Patients

A UHN study, the first of its kind worldwide, has shown how to improve the outcomes of coronary bypass surgery for some patients.

Following coronary bypass surgery, which reroutes blood around clogged arteries to improve blood flow to the heart, some elderly patients experience a decrease in their cognitive abilities. The new study illustrates a way to remedy this by simply “cleaning” the blood removed during surgery.

A tool called “cell saver” filters blood suctioned from the surgical site, removing debris, fats and other small particles, and allows the blood to be retransfused into the patient.

The TGRi team, led by Dr. [George Djaiani](#) and including Drs. [Ludwik Fedorko](#) and [Jacek Karski](#), found that of the 226 elderly patients that were followed, only 6% of patients whose blood was treated with cell saver experienced cognitive dysfunction after surgery. Of patients not receiving the cell saver treatment, 15% experienced a cognitive decline.



“Cell saver not only cleans blood removed during surgery, but it also may help in reducing the body’s inflammation response to surgery in these patients,” notes Dr. Djaiani. “This study was the first to show the efficacy of the cell saver technique in bypass and provides a significant incentive to widely adopt the technique.”

*Circulation*. 2007 Oct 8; [[Pubmed abstract](#)]. Research supported by the Heart and Stroke Foundation.

## Childhood Mood Disorders: New Genetic Evidence

Krembil researcher Dr. [Cathy Barr](#) and colleagues have found evidence that changes in stress hormones play an important role in the development of mood disorders in children.

A total of 382 Hungarian families with diagnosed childhood-onset mood disorder were tested. The AVPR1b gene—responsible for making a brain receptor important in receiving signals to properly respond to stress—was associated with individuals who were diagnosed with mood disorders. Interestingly, the association to DNA changes in this gene appears to contribute to risk more frequently in females than in males.



Says Dr. Barr, "There are other factors that are involved in the development of this condition but by knowing more about the role of genetics, we can use this gene as a target for future therapies to help patients, especially children diagnosed with this condition."

*Arch Gen Psychiatry* 64(10) 1189-1195. [[Pubmed abstract](#)] Research supported by the National Institute of Mental Health and the National Alliance for Research on Schizophrenia and Depression.

## Myeloma: Screening Finds Key Regulator

A common drug used to treat arthritis and other autoimmune disease has been identified by a UHN team as an inhibitor of a critical pathway that promotes the development of myeloma (cancer of the bone marrow).

OCI scientists Drs. [Aaron Schimmer](#), [Dwayne Barber](#), [Shereen Ezzat](#) and other Canadian and American colleagues screened a collection of 2400 off-patent drugs and chemicals and found that the anti-arthritis drug family of glucocorticoids can block an important cancer pathway in myeloma.

“We have identified a new mechanism of action of glucocorticoids that might explain their ability to kill myeloma cells,” says Dr. Schimmer. “These findings suggest a new way to kill myeloma cells and future studies can work towards developing new treatments that specifically target this pathway.”



*Blood* Sept 17 2007 [*Epub ahead*] [[Pubmed abstract](#)]. Research supported by the Multiple Myeloma Research Foundation, the Canadian Institutes of

## Cancer Genes: Proteins Controlling Growth and Survival

Understanding the mechanisms that govern how genes are turned on or off is imperative in developing therapeutic tools for cancer. Current findings from UHN researcher Dr. [Peter Cheung](#) reveal one particular protein that plays a major role in the organization of DNA, ultimately affecting the processes of cell growth and survival.



"The DNA molecule which transmits genetic information is really a long long strand. In the cell, the strand is wound around structures called histones like thread around a spool," explains the OCI researcher.

Using a series of molecular biology investigations, the OCI group found that the histone H2A.Z protein was associated with a relaxed form of the DNA-containing structure, providing insight into how DNA is accessed by other cellular components to turn genes on, off or to manufacture proteins.

Structural changes to H2A.Z caused major modifications in its function that had serious implications for cell growth.

"Understanding histone function sheds light on gene regulation and disruptions in the processes of cell growth and survival," says Dr. Cheung. "Controlling this family of proteins could potentially lead to novel anti-cancer drugs targeting rogue cell growth."

*Molecular and Cell Biology*, September 2007 18(27): 6457-6468 [[Pubmed abstract](#)]. Research supported by the National Cancer Institute of Canada and the Canada Research Chairs program.

## Colorectal Cancer: Understanding the Motivation Behind Genetic Testing

An OCI team has led the first Canadian survey of patients undergoing genetic testing for a hereditary form of non-polyposis colorectal cancer (HNPCC) to identify and understand their motivations behind receiving testing.

"These findings will help pave the way for establishing the kind of support men and women need during genetic testing," says study lead Dr. [Mary Jane Esplen](#).

The results from 314 colorectal cancer patients show that the main motivations for genetic testing are to learn whether children are at an increased risk and if additional cancer screening is required for follow-up on cancer risk. Women and younger patients showed more intense feelings of distress, anxiety and depression associated with potential test results.



According to Dr. Esplen, the study highlights the need for specific genetic counseling support for patients who have increased distress around their genetic test results and to help them understand and deal with the outcomes.

*Clin Genet.* 2007 Sep 24; [Epub ahead of print] [[Pubmed abstract](#)].  
Research supported by the Canadian Institutes of Health Research, the Ontario Women's Health Council and the National Cancer Institute of Canada.

## Breaking News from UHN Research

### Terry Fox Foundation Announces Research Partnership with UHN and Other Cancer Research Hospitals

On October 29, 2007, the Terry Fox Foundation officially announced the creation of the Terry Fox Research Institute—a virtual Canadian research institute dedicated to translational cancer research with nodes in British Columbia, Alberta, Ontario and Quebec. The new institute will launch national collaborative projects that will have impact on patient care in the short term, rather than concentrate on the fundamental cancer biology questions.



The Terry Fox Foundation has committed a minimum of \$50M over the next 5 years. One of the committed partners in the Ontario node is the Ontario Institute for Cancer Research. Together the TFRI and OICR will develop a new program for finding more effective drugs against cancer.

UHN researchers have been highly involved in bringing this new initiative together. OCI's Dr. Rob Rottapel will lead the Ontario node of TFRI. Dr. Chris Paige, who worked with the Terry Fox Foundation over the last two years to develop the Institute, has been named to the Board of Directors of TFRI.

Please visit [www.tfri.ca](http://www.tfri.ca) for more information on the institute and research directions.

### UHN Researcher Wins Canadian Cancer Prize

OCI/PMH's Dr. [Richard Hill](#) has won one of Canada's top cancer research awards, the National Cancer Institute of Canada's 2007 Robert L. Noble Prize, sponsored by the Canadian Cancer Society and recognizing outstanding achievements in cancer research.



Dr. Hill is a senior scientist in the Division of Applied Molecular Oncology at OCI and a Professor in the Departments of Medical Biophysics and Radiation Oncology at the University of Toronto. His research program focuses on laboratory and translational research studies in tumor and normal tissue radiobiology, metastasis and aspects of the tumor microenvironment, notably tumor hypoxia.

## Research Day 07: Celebrating UHN Research

On October 29, 2007, UHN Research Day attracted nearly 400 participants to a full schedule of events, all focusing on research endeavors from UHN's research institutes.

Research Day participants had the opportunity to hear from institute representatives Drs. Ben Neel (OCI), Richard Weisel (TGRI), and Karen Davis (Krembil), who discussed the major research landmarks in the past year, including the recruitment of a number of internationally recognized researchers and plans for the new research building at Krembil.

UHN Research Day 2007



## Innovator Lauded at Research Day

Dr. David Jaffray, OCI Senior Scientist, Division of Biophysics and Bioimaging, and Associate Professor, Department of Medical Biophysics was presented with the 2007 Inventor of the Year award for his creativity in bringing cutting-edge physics and engineering to the practice of imaging in the clinic.

"Dr. Jaffray has been the driving force behind 4 licensed technologies and 12 invention disclosures since he joined UHN in 2002, and is listed as an inventor on 17 published patent applications," notes Dr. Brian Barber, Director, UHN Technology Development and Commercialization, which sponsors the award.

The honour recognizes the UHN inventor or team that has made the greatest contribution to the advancement of human health by means of a patentable invention. Previous winners include Drs. Andres Lozano (2006), Joe Fisher (2005), Dan Drucker (2004) and Kevin Kain (2003).



## Year in Review: 2007 UHN Research Report Online

The newest Research annual report focuses on regenerative medicine research at UHN.

Numerous UHN achievements over the past year are featured, including stories on the launch of the McEwen Centre for Regenerative Medicine, landmark funding from CFI, the arrival of new OCI Director Dr. Ben Neel, and, in the Honor Roll, UHN researchers recognized by peers for their achievements.

For more information on these and the many other highlights of the past year, visit the [2007 Research Report: Regenerating Knowledge](#).



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