



Ontario Insti

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OICR ANNUAL REPORT 06/07

A MESSAGE FROM
THE PREMIER AND
MINISTER OF
RESEARCH AND
INNOVATION

❖ ON BEHALF OF THE GOVERNMENT OF ONTARIO, I am delighted to extend my appreciation and thanks to all of you associated with the Ontario Institute for Cancer Research (OICR) for your hard work in the fight against cancer.

Ensuring the health and well-being of Ontarians is vital. That is why investing in cancer research is a top health care priority for our government. By bringing together leading researchers from across the province in a network that shares resources and critical information, we are moving one step closer to winning the battle against a disease that has touched the lives of so many of us — either directly or indirectly.

The release of its second annual report provides the perfect opportunity for the OICR to highlight some of its major accomplishments. Under the guidance of Dr. Tom Hudson, a strategic plan was developed in consultation with top clinicians in the province and across the globe. World-renowned research scientists are now on board to lead the work that will result in better detection, prevention and treatment of cancer. And a new state-of-the-art laboratory is helping scientists and researchers build on their invaluable work.

By increasing access to study groups, research materials and commercialization experts, the Institute has ensured that more researchers are developing, testing and performing more leading-edge cancer therapies in more Ontario clinics and hospitals. Our government is proud to be a part of this important endeavour.

The OICR's efforts continue to bring hope to Ontarians and Ontario families dealing with cancer. Once again, please accept my sincere thanks for your exceptional work and my best wishes for much ongoing success.



A handwritten signature in black ink that reads "Dalton McGuinty".

Dalton McGuinty
Premier and Minister of
Research and Innovation



A MESSAGE FROM
THE CHAIR OF THE
BOARD OF DIRECTORS
AND THE PRESIDENT
AND SCIENTIFIC
DIRECTOR

◆ **WE ARE PLEASED TO PRESENT** the annual report of the Ontario Institute for Cancer Research (OICR) for 2006-2007. The past year was marked by rapid progress in the start-up of the Institute which was established in December 2005 to enhance Ontario's cancer research capacity with a focus on prevention, early detection, diagnosis and treatment. Immediately after his recruitment in July 2006, as President and Scientific Director, Dr. Tom Hudson began the planning of the Institute, with extensive consultations across Ontario and sought advice from international leaders in clinical and basic sciences.

The task was launched with the vision of creating a new centre of excellence in cancer research that will move Ontario to the forefront of discovery and innovation. This will be accomplished by taking on significant challenges in cancer research with multi-disciplinary, multi-institutional teams. The outcome will be a reduction in the incidence, morbidity and mortality of cancer and Ontario will be recognized internationally as a leading jurisdiction in cancer research. Ontario will also benefit from being more competitive in attracting public and private investment in research and development of new products.

Intensive effort produced an approved strategic plan, recruitment of the first scientists to OICR, the construction of new laboratories and the implementation of several components of the plan by the end of the fiscal year.

MaRS Centre Phase II



STRATEGIC PLAN

The Strategic Plan developed in January 2007 identifies the themes, innovation programs and translation programs that will enable OICR to achieve its vision. Among the first innovation programs are the Ontario Cancer Cohort, a prospective epidemiological study to characterize cancer risk factors affecting our aging population; the One Millimetre Cancer Challenge, which will develop biomarkers and imaging technologies to detect very small tumours; and the Cancer Stem Cell Project, which will investigate the role of cancer stem cells that are resistant to chemotherapy and radiation and cause new tumours to form after treatment.

RECRUITMENT OF PROGRAM LEADERS

OICR has begun to recruit the program leaders who will turn its vision into a reality.

DR. JOHN DICK, Senior Scientist, Division of Cellular and Molecular Biology at the University Health Network's Toronto General Research Institute in Toronto will lead the cancer stem cell initiative, which will develop therapies for cancer stem cells to prevent the recurrence and spread of cancer.

DR. AARON FENSTER, Director of the Imaging Research Laboratories at the Robarts Research Institute in London will lead the imaging platform which will accelerate the development for clinical use of imaging techniques for early diagnosis of cancer.

DR. MARTIN YAFFE, Senior Scientist, Imaging Research at Sunnybrook Health Sciences Centre in Toronto will lead the One Millimetre Cancer Challenge which will develop biomarkers and imaging techniques to diagnose cancer when a tumour is one millimetre in size.

DR. JOHN MCLAUGHLIN, Vice President, Preventive Oncology at Cancer Care Ontario will lead a large multidisciplinary team of clinicians, epidemiologists, environmental experts, ethicists, informaticians and other specialists required to design and implement the Ontario Cancer Cohort.

DR. ROBERT SUTHERLAND, a Canadian who is the former president of Varian Biosynergy of California, has been appointed Vice-President, Commercialization. He will identify projects for early stage development and engage market receptors and investor groups.

OICR LABORATORY

Construction of 10,000 square feet of state-of-the-art laboratory space in the MaRS Centre was completed this spring. The laboratory includes facilities for research in genomics, cancer biology, robotics and supporting services. The first work to be done in the new laboratory will be to develop protocols for high-resolution analyses of chromosomal rearrangements and mutations that are acquired in the development of cancer. This information will generate new gene and protein targets to be used for cancer diagnosis, prognosis and therapy.

ONTARIO TUMOUR BANK

The Ontario Tumour Bank now has a library of more than 33,000 samples from 3,500 donors. Almost 500 samples were distributed to academic and industry cancer researchers over the last year. Currently the bank is planning a multi-year collaboration with Cancer Care Ontario to speed up tumour data collection and increase the amount of data fields collected.

CANCER RESEARCH FUND

Last year the Cancer Research Fund awarded \$8.3 million to 21 projects in two peer-reviewed grant competitions. The awards included almost \$800,000 funding for six high-throughput screening projects that were co-funded by Cancer Care Ontario. These projects are the first step in the development of novel cancer therapies. The other projects included research in breast and ovarian cancer, imaging techniques, biomarkers and validation of therapeutic agents.

CLINICAL TRIALS PROGRAMS

The Clinical Trials Programs are enhancing the cancer clinical trials environment in Ontario. OICR provided funding to cancer treatment centres to hire more than 150 full-time staff members, which resulted in patient enrolment almost doubling since 2004. The website OntarioCancerTrials.ca, which is a comprehensive searchable database of all cancer clinical trials in Ontario, listed 28 per cent more trials in the last year than in the previous year.

ONTARIO CANCER RESEARCH ETHICS BOARD

In the last year the Ontario Cancer Research Ethics Board (OCREB) achieved its goal of doubling the number of hospitals and cancer centres that adopted OCREB as a Board of Record. The number of submissions from researchers wishing to conduct clinical trials increased 81 per cent.

AWARDS

We extend our congratulations to five cancer researchers affiliated with OICR who were recognized nationally and provincially for the excellence of their work.

DR. AARON SCHIMMER, a physician at Princess Margaret Hospital and leader of an internationally recognized research program at the Ontario Cancer Institute in Toronto, was named one of Canada's Top 40 Under 40 this year. He is the recipient of an OICR Cancer Research Fund award.

DR. AARON FENSTER (see page 2) and **DR. TONY PAWSON**, who is a Distinguished Investigator at the Samuel Lunenfeld Research Institute and a member of OICR's Scientific Advisory Board, each received the Premier of Ontario's Discovery Award for Innovation Leadership.

The Premier of Ontario's Summit Awards were bestowed on **DR. JOHN DICK** (see page 2) and on **DR. TAK MAK**, Director of the Campbell Family Institute for Breast Cancer Research and Senior Scientist in the Division of Stem Cell and Developmental Biology at the Ontario Cancer Institute in Toronto and a member of OICR's Scientific Advisory Board. The award provides extraordinary research support, which is granted to a small number of outstanding medical researchers, in partnership with their sponsoring institutions.

ACKNOWLEDGEMENTS

We wish to acknowledge the contribution of the staff of OICR whose talent, enthusiasm and dedication are responsible for the success of the Institute.

The Government of Ontario, through the Ministry of Research and Innovation, has provided continuing support for cancer research and innovation which is gratefully acknowledged.



Left to right, **Dr. John Evans**, Chair, Board of Directors and **Dr. Thomas J. Hudson**, President and Scientific Director.

INNOVATION PROGRAMS

→ ONTARIO CANCER COHORT

ANALYSIS → ONE MILLIMETER CANCER CHALLENGE

TARGETS → CANCER STEM CELL

→ STABILITY

IN

PHARMACEUTICALS → SELF

→ IMMUNO- THERAPIES

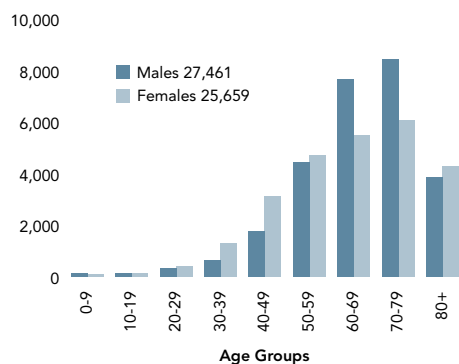
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⇒ PATENTS TO PRODUCTS
HIGH CONTENT TRIALS
CANCER CARE AND
SERVICES RESEARCH.

STRATEGIC PLAN

Cancer is a complex disease that affects almost 60,000 people in Ontario each year.

NEW CASES OF CANCER IN ONTARIO, 2004



Left: **Dr. Tom Hudson**, President and Scientific Director, Ontario Institute for Cancer Research.

✦ **CANCER IS USUALLY DIAGNOSED LATE** in the disease process and can affect anyone. The burden of the disease is significant. Even with a successful outcome, the diagnosis and treatment of the disease cause emotional distress to the patients, their families and friends.

Current therapies have improved survival rates but much remains to be done to make cancer a completely survivable or chronic disease that can be successfully treated.

Immediately following his appointment as President and Scientific Director of OICR in July 2006, Dr. Hudson embarked on a province-wide consultation with leaders in cancer research to learn what type of research is currently being done, the strengths of Ontario cancer researchers, the facilities available in Ontario academia and research institutes, and to obtain advice on the most promising avenues of research that would benefit the people of Ontario and enhance the economy.

Those who met with Dr. Hudson were generous with their time and advice, offering insight and valuable direction for the future research of the Institute. The Strategic Plan for the next three years was completed by the end of January and implementation is underway. Recruitment of program leaders and staff has begun and research collaborations have been formed to advance the programs.

The strategy, which will guide OICR's research over the next three years, focuses on themes, innovation programs and innovation platforms that build on existing cancer research strengths in Ontario and offer the greatest opportunity for success in combating cancer.

Research will be conducted in support of prevention, early diagnosis, cancer targets and new therapeutics. Within these themes, a number of innovation programs have already been identified. The innovation platforms that will be used for this research are imaging and interventions, bio-repositories and pathology, genomics and high-throughput screening, and informatics and biocomputing. OICR's translation programs will move discoveries generated by the research from the laboratory bench to the clinic. The discoveries will be patented and turned into products such as drugs, imaging equipment, prevention or screening programs.

PREVENTION

ONTARIO CANCER COHORT


OICR is collaborating with Cancer Care Ontario on a prospective epidemiological study on lifestyle and behavioural factors that will also collect biological specimens and measure environmental exposures. This is a long-term, multi-disciplinary study that has attracted a number of partners conducting research in other diseases where there are common risk factors, e.g., cardiovascular disease, stroke and diabetes. The Cohort will align with Canadian and international cancer cohorts, e.g., the Tomorrow Project in Alberta and tumour registries and biobanks such as the UK Biobank, and will use harmonized tools developed by the Public Population Project in Genomics.

EARLY DIAGNOSIS

ONE MILLIMETRE CANCER CHALLENGE

The screening of populations at risk and identification of tumours at the millimetre stage would significantly affect the outcome of a diagnosis of cancer. Currently, cancer tumours are usually detected when they

THE BLUEPRINT FOR OICR RESEARCH

Themes	Innovation Programs	Innovation Platforms	Discoveries	Translation Programs
Prevention	<ul style="list-style-type: none"> Ontario Cancer Cohort 	<ul style="list-style-type: none"> Imaging and interventions Bio-repositories and pathology Genomics and high-throughput screening Informatics and biocomputing 		<ul style="list-style-type: none"> Patents to products High content trials Cancer care and services research
Early Diagnosis	<ul style="list-style-type: none"> One Millimetre Cancer Challenge 			
Cancer Targets	<ul style="list-style-type: none"> Cancer Stem Cells Vulnerabilities in cancer genome 			
New Therapeutics	<ul style="list-style-type: none"> Selective agents Immuno- and bio-therapies 			

are over one centimetre in size, containing over 200 million cancer cells. Through its One Millimetre Cancer Challenge Program, OICR plans to develop sensitive biomarkers and imaging technologies that will detect millimetre-size tumours and ensure that they are rapidly developed into methods and devices that can be used in a clinical setting.

CANCER TARGETS

CANCER STEM CELLS

Recent research has demonstrated that a subset of cancer cells, called cancer stem cells, are resistant to chemotherapy and radiation therapy and survive treatment. They are responsible for the creation of new tumours and metastases even years after the initial diagnosis and treatment of the disease. Ontario scientists pioneered this new field of cancer research through the identification of cancer stem cells for leukemia, colon and brain cancer. The objective of the cancer stem cell project, headed by Dr. John Dick, is to identify cancer stem cells for other types of cancer and develop therapies targeted at these cells to prevent recurrence and lessen the toxicity of cancer treatment.

OICR projects will be integrated with four platforms that will develop state-of-the-art knowledge and technologies in the following disciplines, Imaging and Interventions, Bio-repositories and Pathology, Genomics and High-Throughput Screening, and Informatics and Biocomputing.

PARTNERSHIPS

BROAD INSTITUTE OF HARVARD AND MIT

OICR has formed a strategic alliance for collaboration using research platforms developed by the Broad Institute in Boston, Massachusetts. It is a research collaboration of Harvard University, the Massachusetts Institute of Technology and the Whitehead Institute, that is creating new tools for genomic medicine and making them available to researchers.

The Broad Institute is a world leader in genome sequencing, chemical biology and functional genomics. Its RNA (ribonucleic acid) platform is an example of the Broad Institute's expertise in rapidly developing new technologies for applications leading to the deciphering of the function of human genes. RNA is responsible for the physiological function of genes and RNA Interference (RNAi) technology blocks the expression of genes. This technology can be used to identify which genes are

❖ A key feature of the commercialization program will be an “Ontario First Policy” that encourages the maximum participation of Ontario firms in the development, use and commercialization of inventions arising from OICR research projects.

important in the development of cancer and also for the development and validation of drugs. A Canadian researcher, Dr. Jason Moffat, who worked at the Broad Institute and is one of the leaders in the use of this technology, has been recruited back to Ontario by the University of Toronto and will help oversee the technology he developed at the Broad Institute.

INTERNATIONAL LUNG CANCER CONSORTIUM

OICR has joined the Institut National du Cancer in France, Cancer UK, and the National Institutes of Health’s National Cancer Institute in the U.S., to support the International Lung Cancer Consortium created by the World Health Organization’s International Agency for Research on Cancer. OICR is funding researchers in Ontario to conduct genetic studies of Ontario patients with lung cancer. The data will be pooled with data from the studies conducted in other countries to gain more information about the genetic causes of lung cancer.

CANCER CARE ONTARIO

Cancer Care Ontario (CCO) is an umbrella organization that steers and coordinates Ontario’s cancer services and prevention efforts. CCO and OICR have formed an essential alliance for translational research that will benefit the public and cancer patients.

TRANSLATION PROGRAMS

PATENTS TO PRODUCTS

OICR developed a commercialization strategy to ensure that its discoveries move out of the laboratory and into the clinic. The strategy was developed in collaboration with potential partners to ensure that OICR brings added value to the effort and does not duplicate existing functions in the life science sector. Dr. Robert Sutherland was recruited as the Vice-President, Commercialization and he has started to build a team to identify projects for early stage development, manage intellectual property and engage industry and financial organizations. A key feature of the commercialization program will be an “Ontario First Policy” that encourages the maximum participation of Ontario firms in the development, use and commercialization of inventions arising from OICR research projects.

HIGH CONTENT TRIALS AND CANCER CARE SERVICES RESEARCH

After consulting with clinician-scientists in Ontario to obtain advice on the components of the translation programs, OICR established the Clinical Investigation Advisory Board (CIAB) to advise on: strategies to augment OICR’s clinical translation potential, clinical research priorities; and leadership needs of the various clinical research programs. The CIAB is chaired by Dr. Bill Evans, a medical oncologist, who is the President of the Juravinski Cancer Centre in Hamilton and the Regional Vice-President Cancer Services, Hamilton at Cancer Care Ontario. Members include clinicians and clinician scientists in medical, radiation and surgical oncology, molecular pathology and radiobiology. The CIAB developed a plan for the recruitment of two leaders in 2007-2008, that will implement programs for clinical testing of new therapies (High Content Trials Program) and provide evidence-based assessments of benefits, risks and costs regarding the use of such interventions in the health care system (Cancer Care and Services Research Program).



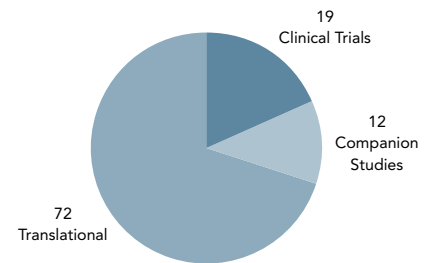
Left to right: **Dr. Jack Gauldie**, Chair of Pathology and Molecular Medicine, Director, Centre for Gene Therapeutics, McMaster University; **Dr. Graeme Fraser**, Clinical Scholar, Hematology, McMaster University, National Cancer Institute of Canada-Terry Fox Foundation, Academic Oncology Fellow; Juravinski Cancer Centre; **Dr. Ronan Foley**, Assistant Professor, Department of Pathology and Molecular Medicine, McMaster University and Hematologist, Hamilton Health Sciences Corporation.

CANCER RESEARCH FUND

THE CANCER RESEARCH FUND supports translational research projects through peer-reviewed grant competitions held twice a year. Funding is available for academic scientists in Ontario and for industry when the principal investigator is at an Ontario university or research institute.

Since 2002, \$55.8 million has been awarded to 103 projects in 21 institutions.

PROJECT TYPE

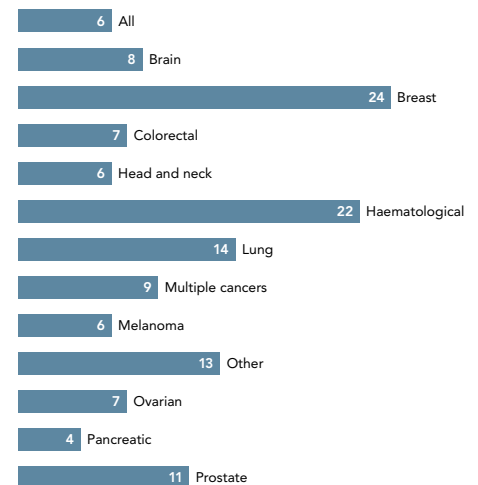


FUNDED PROJECTS

Round	Date	Projects Funded	Funds Awarded (in millions of dollars)
1	May 2002	15	\$6.9
2	November 2002	19	\$8.7
3	May 2003	9	\$4.1
4	November 2003	14	\$7.4
5	May 2004	12	\$7.0
6	May 2005	2	\$8.0
7	November 2005	11	\$5.4
8	May 2006	6	\$0.8
9	November 2006	15	\$7.5
Total		103	\$55.8

CANCER TYPE AND NUMBER OF PROJECTS*

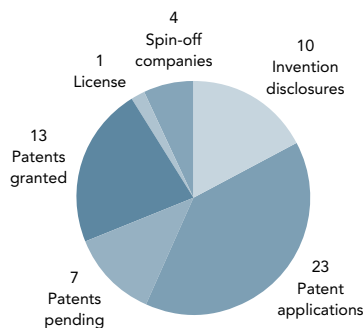
Number of projects in rounds 1-9



* Some projects have an impact on more than one type of cancer

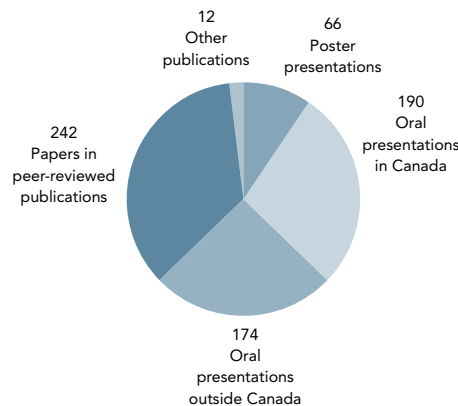
COMMERCIAL ACTIVITY GENERATED BY 71 PROJECTS IN ROUNDS 1-6

2002 - 2005



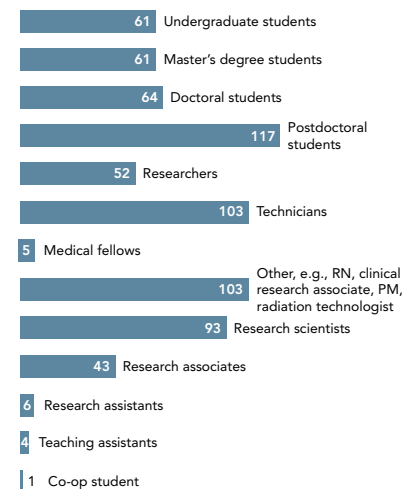
COMMUNICATIONS ARISING FROM 71 PROJECTS IN ROUNDS 1-6

2002 - 2005



HIGHLY QUALIFIED PERSONNEL WORKING ON 71 PROJECTS IN ROUNDS 1-6

2002 - 2005





Left to right: Drs. Micheline Piquette-Miller and Christine Allen.



The PoLi implant that provides sustained release of the anti-cancer agent, paclitaxel.

DRS. CHRISTINE ALLEN AND MICHELINE PIQUETTE-MILLER

Ovarian cancer is the fifth leading cause of cancer deaths in women; the patient survival rate beyond five years is very low. Dr. Christine Allen and co-investigator Dr. Micheline Piquette-Miller, both of the Faculty of Pharmacy at the University of Toronto, are researching a way to improve treatment and increase the survival rate of patients diagnosed with ovarian cancer.

Standard treatment of the disease now consists of surgical removal of the tumour followed by several doses of chemotherapy; only 15 to 35 per cent of women do not suffer a relapse with this treatment. Allen and Piquette-Miller have created a way of delivering substances found in traditional chemotherapy directly to the cancer source over a prolonged period of time to reduce the potential for the return and spread of the cancer.

Their team created an implant system (PoLi) using a biodegradable material that holds the chemotherapy substance. Once the implant is inserted into the patient, the biodegradable material begins to slowly break down and thereby treating the patient with a prolonged, controlled chemotherapy treatment that targets the cancer directly.

The project has been tested in animal models and shows promise for becoming an approved treatment with the potential to increase survival rates of patients with ovarian cancer.

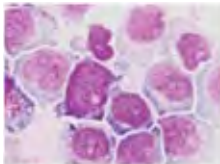


Dr. John Dick

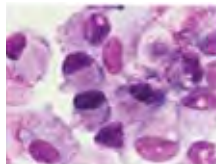
DR. JOHN DICK

Acute myeloid leukemia (AML) is sustained by rare leukemic stem cells (LSC) that are able to survive standard treatment. Dr. John Dick and his team at the University Health Network in Toronto found that these cancer stem cells require a unique micro-environment in the bone marrow to thrive. Interfering with the trafficking of the LSC to the bone marrow environment makes it impossible for them to grow and multiply.

The therapeutic approach blocks protein CD44, interferes with their trafficking, prevents them from attaching to the bone marrow and it induces the cancer cells to become more differentiated. This method targets the cancer stem cells without harming healthy stem cells. Dick's research offers the hope that leukemia can be eradicated and the method used may be applicable to other types of cancer.



Control treatment



H90-treated

Cells treated with H90 show signs of increased differentiation.



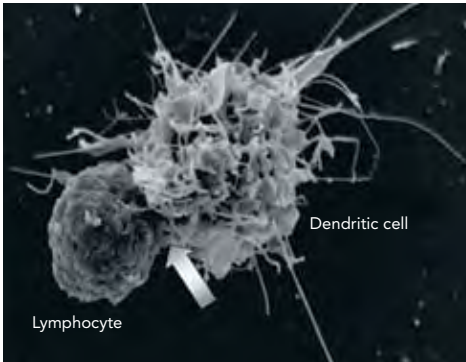
Dr. Jack Gaudie

DR. JACK GAULDIE

Chronic lymphocytic leukemia (CLL) is a type of incurable blood cancer that occurs in the white blood cells that normally aid in the production of antibodies and make the immune system function. Dr. Jack Gaudie, lead investigator at McMaster University's Institute for Molecular Medicine and Health in Hamilton, is investigating a new therapeutic treatment option for treating CLL by using the patient's own immune system to target the cancer cells.

A dendritic vaccine was developed to eradicate cancer by stimulating the immune system to attack tumour cells. The vaccine involves modifying antigens – cell molecules that stimulate the immune system – so that they attack cancer cells and leave healthy cells intact.

Gaudie evaluated the treatment in a pre-clinical trial and received approval from Health Canada to conduct a large-scale clinical trial. Recruitment of patients began in June 2006 and the team is hopeful that this vaccination will increase the survival rate of patients with CLL.



Dendritic cell vaccines educate patients' T lymphocytes to develop resistance to tumours.



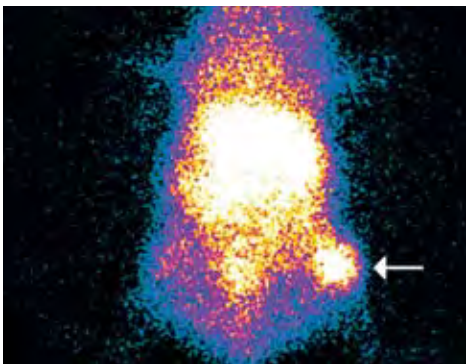
Dr. Raymond Reilly

DR. RAYMOND REILLY

Molecular imaging involves tracking tumours and studying the properties of the cancer cells. Dr. Raymond Reilly, an Associate Professor at the Leslie Dan Faculty of Pharmacy at the University of Toronto and a scientist in the Division of Clinical Investigation and Human Physiology at the University Health Network's Toronto General Research Institute in Toronto, is investigating new molecular imaging agents for cancer. His approach combines radioisotopes with drugs used in standard cancer treatments, converting them into "radiopharmaceuticals". These release gamma rays which can be imaged using a gamma camera making it easier to see tumours, reveal their biological features and improve treatment.

Reilly and his team are using fragments of trastuzumab (Herceptin®) labelled with indium-111 – a radioactive substance. When the trastuzumab is administered intravenously it begins to hone in on the cancer cells marking them for imaging and surgical removal. This technique, called radioimmunoguided surgery, is expected to help surgeons who will use a specially-designed hand-held gamma probe to detect the "radioactively tagged" cancer cells during surgery, ensuring that as much cancerous tissue is removed as possible.

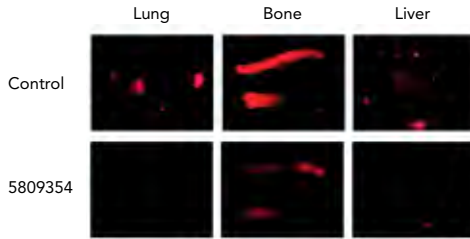
Reilly recently received approval from Health Canada to conduct clinical trials of radioimmunoguided surgery, to be completed with Dr. Claire Holloway, a surgical oncologist at Sunnybrook Health Sciences Centre in Toronto.



Radiolabeled Herceptin® reveals uptake of drug in tumour.



Dr. Aaron Schimmer



Chemical inhibition of FLIP reduced tumour formation.

DR. AARON SCHIMMER

FLIP is a protein found in certain types of cancers including prostate cancer and leukemia. FLIP blocks the protein Caspase 8 that normally communicates when the cell should die. Dr. Aaron Schimmer demonstrated that when FLIP is increased in cancer cells, the cells cannot die, and the cancer spreads into other parts of the body.

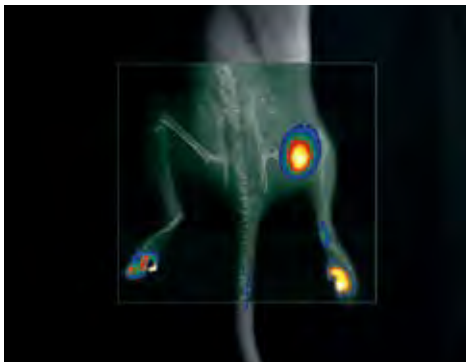
Schimmer and his team at the University Health Network's Ontario Cancer Institute in Toronto, began investigating ways to block FLIP in cancer cells. Early in the project, working with human prostate cells, they discovered that molecule 5809354 inhibits FLIP, making the cancer cells vulnerable to death and preventing them from metastasizing.

Having demonstrated a role for FLIP in metastasis, Schimmer began investigating other potential substances that could also block this process, but act through mechanisms different from 5809354. Through a high-throughput screening process other molecules were found to make the cancer cells more vulnerable to death signals and the team is investigating their properties further. Schimmer also validated CDDO, an organic chemical, as a blocker of FLIP and cell death activator in acute myeloid leukemia cells.

The validation of CDDO has led to an early stage clinical trial at Princess Margaret Hospital in Toronto.



Dr. Gurmit Singh



Detection of bone metastasis.

DR. GURMIT SINGH

A technique combining imaging and genetics can track cancer cells in mice and reveal patterns and details of the disease. Dr. Gurmit Singh, Director of Research at the Juravinski Cancer Centre in Hamilton and his team created a unique system that images cancer cells as they are spreading and can also detect when cells are dying.

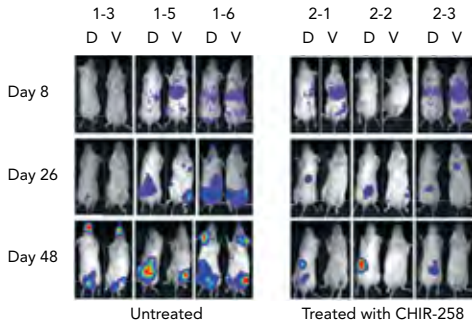
Singh combines a fluorescent protein found in light-generating creatures, such as fireflies and jellyfish, with cancer cells which are then injected into rodents. Using a very powerful camera, the Andor Ikon CCD, he was able to track the cancer cells.

Bioluminescent cells give off light as they die, which makes Singh's approach to this type of imaging unique. Treatments, such as chemotherapy or standard drugs, are administered and as the cancer cells die, the bioluminescent cells reveal how effectively targeted the treatment is, emitting light which can be imaged. Singh and his team are screening standard therapies to see how they respond to various sites within the body.

Being able to see where cancer cells are will enable the group to rapidly screen novel cancer treatments before recommending them for further clinical studies and could lead to innovative and effective cancer treatments.



Dr. Suzanne Trudel



DR. SUZANNE TRUDEL

Multiple myeloma is an incurable cancer of the blood. By identifying cancer-specific genes, new targeted treatments can be investigated. Along with her team, Dr. Suzanne Trudel, a scientist in the Division of Applied Molecular Oncology of the University Health Network's Ontario Cancer Institute in Toronto, identified FGFR3 as a cancer-specific gene associated with about 20 per cent of all multiple myeloma cases.

Trudel's research focuses on identifying potential drugs that can block the function of gene FGFR3 and lead to more effective treatments of multiple myeloma. Through pre-clinical research and screening, several substances have been identified as potential inhibitors of FGFR3.

In 2004, an early stage clinical trial was established to screen patients for the FGFR3 gene, to monitor and compare the effectiveness of the drug CHIR-258 in patients both with and without the gene and to identify the therapeutic dosage. Through this trial, markers have been identified which predict whether the drug will block the cancer gene FGFR3 in patients. In addition to this trial, two more promising drugs have been identified by Trudel's team; one will be entering a mid-stage clinical trial in 2007.



Dr. Ken Evans

ONTARIO CANCER BIOMARKER NETWORK

There is a great deal of excitement in the scientific community about the significant role biomarkers could play in the diagnosis and prognosis of cancer as well as in the development of personalized cancer therapies. The Ontario Cancer Biomarker Network (OCBN) was created with funding from OICR in December 2005 to accelerate and augment cancer biomarker discovery, validation and commercialization. The network of pathologists, clinical oncologists, proteomic and genomic researchers, bioinformaticians and statisticians is led by Dr. Ken Evans, president and CEO and Dr. Eleftherios Diamandis, principal investigator.

OCBN's facility in the MaRS Centre in Toronto is filled with state-of-the-art equipment acquired through collaborations with research instrument manufacturers. More than 20 diverse research programs are underway, using numerous technological platforms and methodological approaches to study biomarkers' association with various types of cancer. Other projects involve drug development programs.

A portfolio of intellectual property that can be validated and developed with a view to commercialization is growing, helping OCBN to move towards its goal of sustainability.



ONTARIO TUMOUR BANK

◆ THE ONTARIO TUMOUR BANK (OTB) is a biorepository and data bank that collects human tumour and other tissues across the province and makes them available to academic and industry-based cancer researchers.

One of OTB's customers is the internationally renowned scientist Dr. Tak Mak who has been using OTB's samples since the program was in its testing phase in 2004. Dr. Nancy Ng, a colleague of Dr. Mak's, is the Therapeutics Director of Project Management at the Campbell Family Institute for Breast Cancer Research in Toronto. "The Ontario Tumour Bank provides a very valuable service to researchers," states Dr. Ng. "Its use of strict, standardized collection procedures to ensure high-quality samples and the availability of clinical data that accompanies each sample are added benefits."

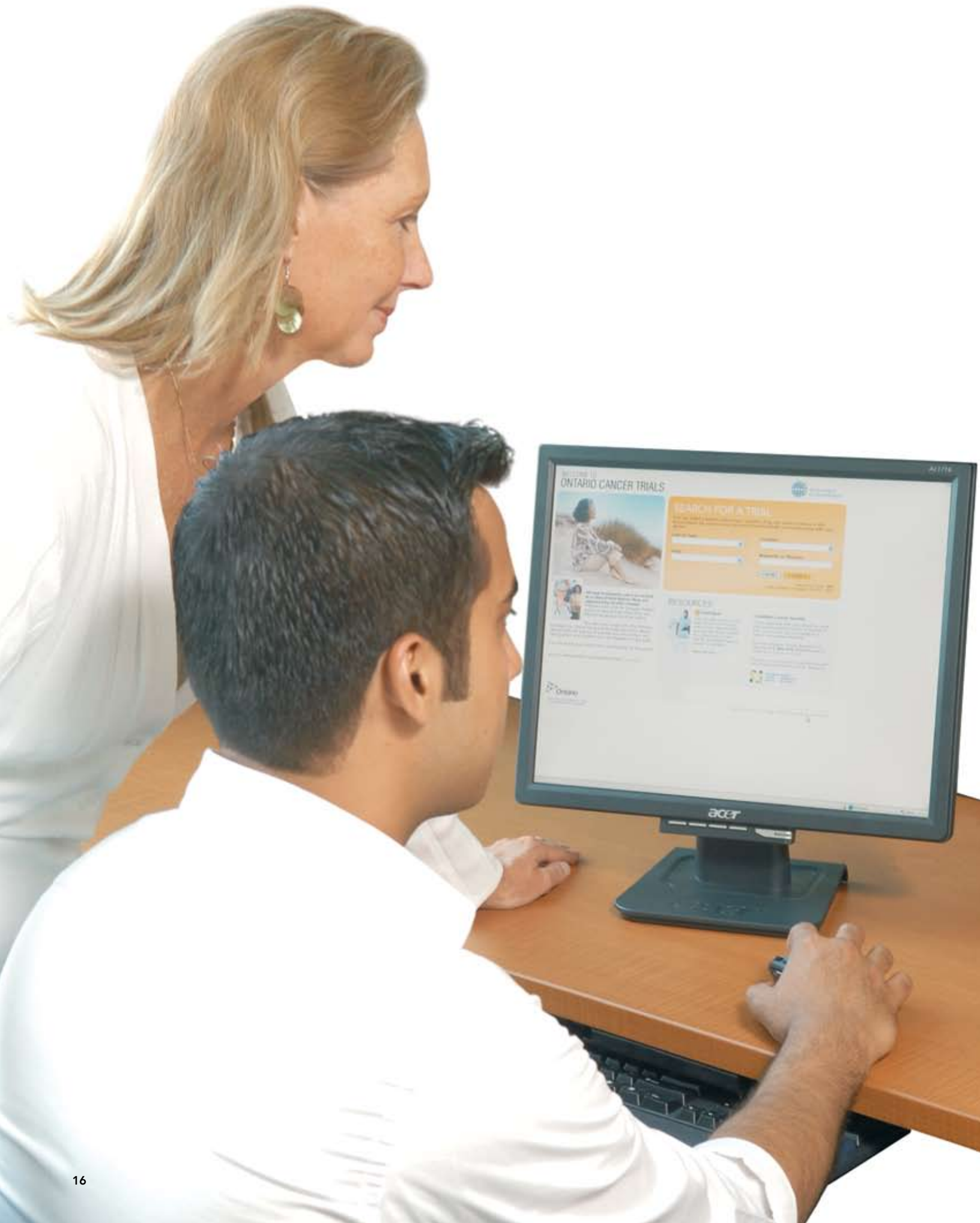
Since its inception, OTB has continuously expanded and now has a library of more than 33,000 samples from approximately 3,500 donors, which include tumour tissue, normal adjacent tissue and peripheral blood. During the past year OTB distributed almost 500 samples.

"The tumour samples and complete clinical information that we have received from the Ontario Tumour Bank have been essential to Med BioGene Inc. being at the forefront of discovering and developing cancer diagnostics," said Nathan Yoganathan, president and chief scientific officer of Med BioGene, Inc.



Left to right: Christina Rodriguez, Jennifer Liauw, Dr. Brent Zanke, Liz Koen, Sugy Kodeeswaran, Ontario Tumour Bank.

Left: **Dr. John Srigley**,
Chief, Laboratory Medicine,
Credit Valley Hospital and
Provincial Head, Pathology
and Laboratory Medicine,
Cancer Care Ontario.



CLINICAL TRIALS PROGRAMS

In 2004, the Clinical Trials Infrastructure Fund (CTIF) program set a goal to double patient recruitment.... In March 2007, the goal had almost been reached with an overall increase in patient enrolment by 92 per cent.

◆ THE MISSION OF THE CLINICAL TRIALS PROGRAM is to lead the process of improvements necessary to promote speed, quality and access to clinical trials for patients in Ontario, with the aim of advancing cancer treatments.

DOUBLING RECRUITMENT AND INFRASTRUCTURE

In 2004, the Clinical Trials Infrastructure Fund (CTIF) program set a goal to double patient recruitment into cancer clinical trials in the 28 participating cancer treatment centres within three years. In March 2007, the goal had almost been reached with an overall increase in patient enrolment by 92 per cent.

A secondary goal of the CTIF sought to double the amount of hospital personnel to increase clinical trial activity at participating sites with a budget of \$12.9 million over three years; this goal was also achieved. From the inception of CTIF, the number of clinical trials staff has increased by 96 per cent at the sites. More than 150 full-time staff members were hired increasing the potential amount of clinical trials activity.

Dr. Jim Wright, head of clinical trials at the Juravinski Cancer Centre in Hamilton says, "the Clinical Trials Infrastructure Fund has allowed us to train additional research personnel in anticipation of increased clinical trials activity. With well trained research staff in place we were then able to accelerate our growth and like most centres, the Juravinski Cancer Centre almost doubled the number of patients enrolled in clinical trials during the first three years of funding. We believe clinical trials are advantageous for our clinician investigators, our industry partners and most importantly our patients."

TRAINING CLINICAL TRIALS PERSONNEL

To provide clinical trials staff with the tools and information needed to perform their duties as efficiently as possible, the Clinical Trials Network began to deliver training workshops in 2005. This year, 160 people participated in the basic and intermediate workshops, bringing the total number of participants to 352.

Dr. Susan Dent, a medical oncologist and Head of Clinical Trials Research at the Ottawa Hospital Regional Cancer Centre says, "These workshops are great. They provide clinical trials staff with an opportunity to keep up-to-date on the changing environment in clinical trials as well as to discuss common problems in clinical research encountered by centres throughout the province."

Left to right: **Patricia Falzon**,
Event Coordinator and
Owais Jaleel, Coordinator,
Ontario Cancer Trials, Ontario
Institute for Cancer Research.

❖ The architecture of the website was built with the capability for a Canada-wide cancer clinical trials database which will be available this winter.

ONTARIOCANCERTRIALS.CA

While clinical trials infrastructure helps support clinical trial activity within the hospitals, OntarioCancerTrials.ca serves to inform patients about cancer clinical trials being conducted in Ontario for which they may be eligible. OntarioCancerTrials.ca is a comprehensive searchable database meeting the World Health Organization criteria as a registry. The website is now averaging about 450 trial listings – a 28 per cent increase from last year. Approximately 150 trials were added this year and the website continues to be updated daily ensuring that the data listed is always as up-to-date as possible.

Visitors to the site can ask to be informed by e-mail about clinical trials appropriate to their needs. Approximately 25 people are signing up monthly for e-mail alerts.

To provide easier navigation and more specialized search features, OICR redesigned <http://OntarioCancerTrials.ca>. The effectiveness and accuracy of the site has prompted the demand for a national cancer clinical trials searchable database. The architecture of the website was built with the capability for a Canada-wide cancer clinical trials database which will be available this winter.

CLINICAL TRIALS ADVISORY COUNCIL

The Clinical Trials Advisory Council (CTAC) was established in March 2007, comprised of representatives of the cancer treatment centres with Dr. Jim Wright, an oncologist and head of cancer clinical trials at the Juravinski Cancer Centre in Hamilton, as its first chair. The funding that had been provided to cancer treatment centres through the Clinical Trials Infrastructure Fund, enabled the centres to hire additional staff and therefore conduct more clinical trials than they had in the past. A portion of the extra revenue generated by conducting these additional trials was placed in a fund administered by OICR. CTAC is advising OICR and the centres on the best use of those funds.

CANCER CLINICAL TRIALS CONSORTIUM

Work began during the year to create a Cancer Clinical Trials Consortium to standardize the way cancer clinical trials are initiated and conducted with a view to shortening the time required to complete an ethics review and to standardize budgets. This would allow for a quicker start-up of the trials and reduce costs. A pilot program at the Hamilton Health Sciences Centre, Sunnybrook Health Sciences Centre and The Ottawa Hospital is scheduled to begin in 2008.



Standing, left to right: Owais Jaleel and Michelle Alborno.
Seated, left to right: Kay Friel and Patricia Falzon,
Clinical Trials Programs.



Dr. Ronald Heslegrave
Chair, OCREB



Janet Manzo
Executive Director, OCREB



Dr. Raphael Saginur
Chair, OCREB Advisory
Committee

ONTARIO CANCER RESEARCH ETHICS BOARD

The mandate of the Ontario Cancer Research Ethics Board (OCREB) is to ensure the protection of human subjects involved in cancer research in Ontario. As a provincial REB, OCREB also strives to reduce the workload and duplication associated with reviews of the same study by multiple ethics boards and decrease the time it takes to get a study approved initially and at multiple sites across the province.

Created in 2004, OCREB is currently the research ethics board for multi-centre oncology clinical trials in 14 cancer treatment centres in Ontario. This represents a 100 per cent increase in the number of centres using OCREB in the last 18 months.

In the last year, the number of new protocols submitted to OCREB increased from 31 to 56. The number of clinical trials submitted more than doubled over the same period from 21 to 54. Three initiatives launched in early 2007 will reduce the workload of investigators and their staff at the local level, enhance patient protection and strengthen communication: 1) a centralized system for receiving and tracking the myriad reports of external Serious Adverse Events (SAEs), 2) a standardized consent form template, and 3) a monthly open dialogue with local centres. By incorporating input from the Ontario oncology research community and national partners such as the Clinical Trials Group of the National Cancer Institute of Canada, these endeavours demonstrate the collaborative nature of OCREB's operations and reflect a strong emphasis on continuous communication.

"OCREB has made great progress in improving the clinical trials infrastructure in Ontario," said Dr. Padraig Warde, Medical Director of the Clinical Research Unit at Princess Margaret Hospital in Toronto. "Having one provincial Research Ethics Board for multi-centre studies has speeded up the whole process of study approval and avoided unnecessary duplication of effort."

HOSPITALS/CANCER TREATMENT CENTRES USING OCREB

- Cambridge Memorial Hospital
- Grand River Regional Cancer Centre (Kitchener)
- Juravinski Cancer Centre (Hamilton)
- London Regional Cancer Program
- Mount Sinai Hospital (Toronto)
- Niagara Health Sciences (St. Catharines)
- Ottawa Hospital Regional Cancer Centre
- Princess Margaret Hospital (Toronto)
- Southlake Regional Health Centre (Newmarket)
- Thunder Bay Regional Health Sciences Centre Cancer Care Program
- Toronto East General Hospital
- Toronto Sunnybrook Regional Cancer Centre
- Trillium Health Centre (Mississauga)
- Windsor Regional Cancer Centre

FINANCIAL STATEMENTS



AUDITORS' REPORT

◆ TO THE DIRECTORS OF ONTARIO INSTITUTE FOR CANCER RESEARCH

We have audited the balance sheet of Ontario Institute for Cancer Research as at March 31, 2007 and the statements of operations and surplus and cash flows for the year then ended. These financial statements are the responsibility of the organization's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of the organization as at March 31, 2007 and the results of its operations and its cash flows for the year then ended in accordance with Canadian generally accepted accounting principles.

Smich Nixon LLP

Licensed Public Accountants
Chartered Accountants
Toronto, Ontario
June 1, 2007

EXCERPT FROM AUDITED FINANCIAL STATEMENTS

BALANCE SHEET

AS AT MARCH 31

2007

2006

ASSETS

CURRENT ASSETS

Cash	\$	4,885,662	\$	1,842,776
Other receivables		1,017,980		325,830
Inventory		683,706		–
Prepaid expenses		209,176		52,818
		6,796,524		2,221,424

PROPERTY AND EQUIPMENT

5,834,722

813,644

NOTE RECEIVABLE

500,000

–

\$ 13,131,246 **\$ 3,035,068**

CURRENT LIABILITIES

Accounts payable and accrued liabilities	\$	2,799,689	\$	777,702
DEFERRED REVENUE		8,782,218		1,893,239
TERM LOAN		500,000		–

SURPLUS

Unrestricted		1,049,339		364,127
	\$	13,131,246	\$	3,035,068

STATEMENT OF OPERATIONS AND SURPLUS

FOR THE YEAR ENDED MARCH 31

			2007	2006
	CANCER RESEARCH PROGRAM	ONTARIO CANCER RESEARCH NETWORK		
REVENUE				
Grant funding	\$ 13,084,478	\$ 6,599,491	\$ 19,683,969	\$ 5,216,164
Fee and workshop revenue	–	681,427	681,427	335,862
Non grant interest	–	3,772	3,772	3,103
Other grant funding	9,180	379,372	388,552	–
	13,093,658	7,664,062	20,757,720	5,555,129
EXPENSES				
Amortization	106,069	268	106,337	17,776
Audit	32,418	–	32,418	13,145
Capital expenses	9,064	54,668	63,732	542,117
Electronic data capture	–	1,923,864	1,923,864	–
Clinical trials network-programs	7,343	4,800	12,143	22,220
Contracted services	329,919	453,566	783,485	257,565
Large scale population cohort program	17,990	–	17,990	80,000
Grants	10,132,368	866,831	10,999,199	40,747
Information system support	–	261,609	261,609	540,816
Insurance	21,965	21,832	43,797	41,753
Legal	32,866	16,351	49,217	103,154
Marketing and communications	156,137	39,420	195,557	188,922
Office and general	102,332	221,433	323,765	131,717
Research ethics board	–	105,517	105,517	100,324
Rent	737,093	72,397	809,490	109,559
Salaries, benefits and contracting	1,101,646	1,548,144	2,649,790	1,792,343
Support service fees	134,280	371,235	505,515	367,943
Travel	127,390	166,571	293,961	136,519
Tumour bank implementation and operation	–	850,344	850,344	693,195
Scientific advisory board	44,778	–	44,778	36,350
	13,093,658	6,978,850	20,072,508	5,216,165
EXCESS OF REVENUES OVER EXPENSES	–	685,212	685,212	338,964
SURPLUS, BEGINNING OF YEAR	–	364,127	364,127	25,163
SURPLUS, END OF YEAR	\$ –	\$ 1,049,339	\$ 1,049,339	\$ 364,127

A copy of the complete audited financial statements is available upon request.

BOARD OF DIRECTORS, SCIENTIFIC ADVISORY BOARD AND SENIOR MANAGEMENT

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Clinical Trials Research Group
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Princess Margaret Hospital

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Ronald Worton

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Ottawa Health Research Institute

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Center for Cancer Research
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Kay Friel

Director, Clinical Trials Programs

Janet Manzo

Executive Director, Ontario Cancer
Research Ethics Board

Teresa Petrocelli

Director, Grants and Awards



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