OICR invests $2.25 million to move cancer discoveries from the lab into the clinic

Toronto – April 22, 2009. Dr. Tom Hudson, President and Scientific Director of the Ontario Institute for Cancer Research (OICR) today announced the investment of $2.25 million in five promising early stage cancer technologies, including a minimally invasive treatment for tumours, a targeted delivery system for a cancer therapeutic, two new tests that will help doctors diagnose tumours earlier and a new therapeutic. The recipients will use the funds to continue the early commercial development of their discoveries.

The recipients of the awards are:

- Princess Margaret Hospital Cancer Program, University Health Network, Toronto, for Dr. Michael Sherar's novel radio frequency ablation technology for treatment of solid tumours;

- Princess Margaret Hospital Cancer Program, University Health Network, Toronto, for the development of novel chemical proteasome inhibitors by Dr. Aaron Schimmer;

- Princess Margaret Hospital Cancer Program, University Health Network, Toronto, for Dr. Gang Zheng's nanoparticles for targeted delivery of siRNA-based cancer therapeutics;

- Sunnybrook Health Sciences Centre, Toronto, for the development of Glypican-3 as a novel marker for the early diagnosis of hepatocellular carcinoma by Dr. Jorge Filmus;

- University of Toronto, for Drs. Shana Kelley and Ted Sargent's GenEplex platform for detection of cancer biomarkers.

"The Ontario Institute for Cancer Research is turning Ontario's world-class cancer research into better prevention, improved patient care, new technologies and more effective therapies for people," said Minister of Research and Innovation, John Wilkinson. "Our government is proud to be supporting leading scientists whose work in Ontario means a more vibrant research community, a stronger economy, and better lives for people here at home and around the world."

OICR will actively participate in efforts to commercialize the selected projects by providing additional expertise and resources and working collaboratively with the recipients and their scientists.

"It is important that promising cancer research projects receive the funding they need to successfully move out of the lab and into the clinic," said Dr. Hudson. "We are happy to assist these researchers in developing these technologies further and eventually create new treatments to help people living with cancer."

The Ontario Institute for Cancer Research is a new research institute, moving Ontario to the forefront of discovery and innovation. It is dedicated to research in prevention, early detection, diagnosis and treatment of cancer. OICR is a not-for-profit corporation funded by the Government of Ontario through the Ministry of Research and Innovation.

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Backgrounder

Dr. Michael Sherar, Princess Margaret Hospital Cancer Program, University Health Network
Novel radio frequency ablation technology for treatment of solid tumours

Current procedures to treat tumours can require invasive surgery or produce harmful side effects for patients. But researchers at the University Health Network (UHN) are developing a new technology that will treat solid tumours up to 6 cm in diameter non-invasively, including those found in liver, kidney and lung. The treatment is based on a novel approach that deploys a helical coil around the tumour through a small single needle insertion. Radio frequency energy is applied to the coil, which then heats and kills the tumour (called Radiofrequency Ablation or RFA). Conventional RFA is not effective in completely eliminating larger tumours and has been shown to produce incomplete results in smaller tumours due to uneven heating. The new RFA system produces uniform heating within the tumour allowing the destruction of both large and small tumours in a single treatment. This has the potential to minimize the effects of surgery on patients living with cancer and reduce health care costs due to lower risk of trauma and faster patient recovery time.

Dr. Aaron Schimmer, Princess Margaret Hospital Cancer Program, University Health Network
Development of novel chemical proteasome inhibitors

It is estimated that in 2008 more than 44,000 new leukemia, lymphoma and myeloma cases will be diagnosed in North America. Relapsed and refractory hematologic malignancies have poor responses to standard therapy and are associated with a poor prognosis. Allogeneic bone marrow transplantation is the only curative option for patients obtaining a second remission, but this treatment modality is not universally available due to lack of donors and other factors. Thus, there is an urgent need for new agents in relapsed and refractory hematologic malignancies such as acute leukemia. Dr. Aaron Schimmer at the University Health Network (UHN) has identified the proteasome inhibitor 5AHQ, a compound related to an off-patent antimicrobial compound. Proteasome inhibitors block the proteasomal break-down of excess and damaged proteins inside the cell, thereby stopping certain tumours from developing further. 5AHQ binds to a different site on the proteasome than the proteasome inhibitor bortezomib (Velcade™; sales of approximately $265 million in 2007 in North America), which has been approved by Health Canada and the FDA for the treatment of multiple myeloma and is currently under evaluation for the treatment of other cancers. Dr. Schimmer has also shown that 5AHQ and bortezomib's effects are synergistic and, due to the different mechanism of proteasomal inhibition, 5AHQ cannot only be used as a primary treatment agent but can also be used on patients that are bortezomib resistant.

Dr. Gang Zheng, Princess Margaret Hospital Cancer Program, University Health Network
Nanoparticles for targeted delivery of siRNA-based cancer therapeutics

Short sequences of interfering RNA (siRNA) have a remarkable ability to stop the activity of specific cancer causing genes. However, the biggest challenge for potential siRNA-based therapeutics is finding a way to deliver the siRNA to the correct cells

and tissues at a level that is safe for patients. Nanoparticles are a potential solution to this problem. These tiny particles, much smaller than a human cell, can be used as carriers to deliver siRNA to specific parts of the body. Dr. Gang Zheng at the University Health Network has developed a novel class of nanoparticle carriers (termed “HPPS”) that offer unprecedented accuracy and efficiency in delivering siRNA. HPPS is a simple and robust preparation made from nontoxic biocompatible components that mimic the structure and superior pharmacologic properties of native HDL (the ‘good cholesterol’ carrier found in the body). HPPS is smaller than most siRNA nanoparticles with a precisely controlled size that is able to navigate the body's natural defences.

Dr. Jorge Filmus, Sunnybrook Health Sciences Centre
Glypican-3: a novel marker for the early diagnosis of hepatocellular carcinoma

Hepatocellular carcinoma (HCC) is the fifth most common cancer in the world and it remains difficult to diagnose at the early stages. The blood marker that is currently used, called AFP, is not elevated in most cases of early stage cancer, and the average life expectancy of patents with disseminated HCC is only six months. Dr. Jorge Filmus, a researcher at Sunnybrook Health Sciences Centre, has developed a test that could make diagnosis easier and help patients to receive treatment sooner. The test uses a protein called Glypican-3 (GPC3), which is found in about three quarters of HCC tumours but not in normal liver or non-cancerous diseased liver. GPC3 can be detected in the blood of the majority of people with HCC and because it is not found in healthy people or in patients with hepatitis it can accurately detect the presence of HCC. Patients with chronic hepatitis B or C are at high risk of developing HCC but early detection significantly increases the chance of a cure.

Drs. Shana Kelley and Ted Sargent, University of Toronto
Validation of the GenEplex electronic molecular diagnostic platform and application to oncological management

There is a need for faster, more cost-effective and more sensitive devices to detect known cancer biomarkers at the earliest stages of tumour development. The GenEplex platform, co-invented by Dr. Shana Kelley and Dr. Ted Sargent at the University of Toronto, will address this need with a new chip-based technology that reports DNA, RNA and protein binding events as strong, readily interpreted electrical currents. The platform consists of simple electronic chips that are easy and cost effective to produce, and an inexpensive chip reader that can be miniaturized. GenEplex was shown to be highly effective by rapidly, correctly and inexpensively identifying a panel of prostate cancer biomarkers in tumour tissue. The next stage of development of GenEplex is validation of the platform using clinically accepted biomarkers for leukemia.