



# NEWS RELEASE

University Health Network

Toronto General Hospital Toronto Western Hospital Princess Margaret Hospital

## UHN scientists discover stem cells that cause colon cancer

(Toronto – November 20, 2006) – Scientists at University Health Network have discovered that colon cancer originates from rare colon cancer stem cells. This new knowledge is key for developing new targeted therapies that prevent recurrence of the disease. Only one in 57,000 colon tumour cells is a cancer stem cell.

The paper is published November 19, 2006 in an advance online edition of the international scientific journal *Nature*.

“We found that not every tumour cell is equally capable of sustaining tumours in the colon,” says Dr. John Dick, the study’s principal investigator and senior scientist at Ontario Cancer Institute, the research institute of Princess Margaret Hospital (University Health Network). Dr. Dick is also senior scientist at Toronto General Research Institute (University Health Network), Canada Research Chair in Stem Cell Biology, and professor of molecular and medical genetics at the University of Toronto.

“Colon cancer stem cells are the driving force initiating and sustaining these tumours,” says Dr. Dick. “Since this is the heart of the tumour, you have to find and kill each of these colon cancer stem cells to truly cure the disease.”

Based on this discovery, scientists can now begin to identify unique genetic properties of colon cancer stem cells and then develop drugs targeting these characteristics to prevent the disease from recurring.

The scientists analyzed tumour samples from patients with primary and metastatic colon cancer. They divided the cancer cells into different groups based on the amount of protein called CD133, which is located on the surface of some cells. Cells that do not have CD133 are called CD133- while cells containing the protein are called CD133+. The scientists injected cells with different amounts of CD133 into immuno-deficient mice. They found that CD133+ cells generated tumours in the mice while the CD133- cells did not generate tumours. They also observed that the new tumours were composed of both CD133+ cells and CD133- cells, proving that both types of cells originated from the initial transplanted cell.

According to the Canadian Cancer Society, one in 16 Canadian women will develop colorectal cancer during her lifetime and one in 31 will die from it. One in 14 Canadian men will develop the disease and one in 28 will die from it. The disease often develops over a long period of time without any signs or symptoms until the cancer has progressed.

The research was supported by a clinician-scientist award to the paper’s first author Dr. Catherine O’Brien, grants from the Canadian Institute of Health Research, grants from Genome Canada through the Ontario Genomics Institute, the Ontario Cancer Research Network (now a program of the Ontario Institute for Cancer Research) with funds from the Province of Ontario, the Leukemia and Lymphoma Society, the National Cancer Institute of Canada with funds from the Canadian Cancer Society and the Terry Fox Foundation, and the Canada Research Chair program.

University Health Network is a major landmark in Canada’s healthcare system, and a teaching hospital of the University of Toronto. Building on the strengths and reputation of each of our three hospitals and affiliated research institutes, Toronto General Hospital, Toronto Western Hospital and Princess Margaret Hospital, UHN brings together the talent and resources needed to achieve global impact and provide exemplary patient care, research and education.

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