

# Going to all ends to prevent relapse of neural cancers

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## New therapy may reduce risk of cancerous neural tumours returning

TORONTO – Blocking an enzyme that is involved in the regeneration of cancer stem cells may be the key to treating tumours in the brain and other parts of the nervous system, according to a study from The Hospital for Sick Children (SickKids). Paediatric neural tumours – such as brain tumours and neuroblastoma (one of the common cancers of infants and children) – are the leading cause of death in childhood cancer, accounting for up to 40 per cent of deaths. This is invariably due to the tumour’s ability to recur even after aggressive treatment when no visible trace of the tumour remains.

The study, published in the January 1 advance online edition of *Clinical Cancer Research*, focused on telomeres and an enzyme called telomerase. Telomeres are structures that protect the end of chromosomes. With each cell division the structures get shorter and shorter which eventually stops cell growth. Only cells that activate the enzyme telomerase can maintain the length of telomeres and therefore keep growing.

“Telomerase inhibition is a novel approach to paediatric cancer treatment,” says Dr. [Uri Tabori](#), Staff Oncologist at SickKids, Principal Investigator of the study and at The Arthur and Sonia Labatt Brain Tumour Research Centre. “It treats the potential relapse, while therapies such as chemotherapy and radiation attack the initial tumour.”

Before this research, the common belief was that both normal stem cells and tumour cells require the enzyme telomerase for limitless self-renewal. As a result, scientists thought that stopping the production of telomerase would be unsafe and prevent the renewal of both healthy and cancerous cells. This, they believed, could have adverse effects on normal nervous-system development and maintenance. In this study, researchers discovered that only cancer stem cells depend on the enzyme to sustain their survival and self-renewal potential.

“Normal stem cells surprisingly do not require telomerase for self-renewal and are not sensitive to telomerase inhibition. On the other hand, cancer stem cells are ‘addicted’ to the enzyme and are extremely sensitive to this therapy,” says Tabori who is also Assistant Professor of Paediatrics at the University of Toronto. “This therapy is unique because it is specific to a subpopulation of cancer cells, the cancer stem cells, that are likely responsible for tumour recurrence.”

Telomerase inhibition in combination with current therapies could eventually serve as a new therapeutic approach for cancer and be both effective and safe for children with neural tumours.

The next step is for researchers to work on translating these findings into a new treatment for children with cancer. “The hope is that this specific therapy might prevent relapse, which we believe is the major cause of death.”

The study is supported by the [Canadian Institutes of Health Research](#) (CIHR), [The Ontario Institute for](#)

[Cancer Research](#), the National Cancer Institute of Canada, [the James Fund](#) and [SickKids Foundation](#).

### **About The Hospital for Sick Children**

The Hospital for Sick Children (SickKids) is recognized as one of the world's foremost paediatric health-care institutions and is Canada's leading centre dedicated to advancing children's health through the integration of patient care, research and education. Founded in 1875 and affiliated with the University of Toronto, SickKids is one of Canada's most research-intensive hospitals and has generated discoveries that have helped children globally. Its mission is to provide the best in complex and specialized family-centred care; pioneer scientific and clinical advancements; share expertise; foster an academic environment that nurtures health-care professionals; and champion an accessible, comprehensive and sustainable child health system. SickKids is proud of its vision of *Healthier Children. A Better World.*™ For more information, please visit [www.sickkids.ca](http://www.sickkids.ca).

### **About SickKids Research & Learning Tower**

SickKids Research & Learning Tower will bring together researchers from different scientific disciplines and a variety of clinical perspectives, to accelerate discoveries, new knowledge and their application to child health – a different concept from traditional research building designs. The Tower will physically connect SickKids science, discovery and learning activities to its clinical operations. Designed by award-winning architects Diamond + Schmitt Inc. and HDR Inc. with a goal to achieve LEED® Gold Certification for sustainable design, the Tower will create an architectural landmark as the eastern gateway to Toronto's Discovery District. SickKids Research & Learning Tower is funded by a grant from the Canada Foundation for Innovation and community support for the ongoing fundraising campaign. For more information, please visit [www.buildsickkids.com](http://www.buildsickkids.com).

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