

About the Thunder Bay Regional Research Institute

The Thunder Bay Regional Research Institute is Canada's newest health research institute located in Thunder Bay, Ontario. It is an independent, not-for-profit research corporation and a joint venture partner of Thunder Bay Regional Health Sciences Centre (TBRHSC).



The Research Institute's mission is to improve the quality of healthcare through excellence in patient-centred research, pioneering a new standard of excellence in the clinical investigation of novel molecular imaging-based diagnostic technologies for disease prevention, early detection and image-guided treatment. Key partners include Sunnybrook Health Sciences Centre, Lakehead University, Philips Healthcare, Cancer Care Ontario, the Northern Ontario School of Medicine and Confederation College.

Cancer is one of the leading health concerns in Northwestern Ontario, and is the primary focus for the Research Institute. All research done at the Thunder Bay Regional Research Institute will be motivated by patient needs. This **patient-centred research focus** is unique, and will transform patient care in Northwestern Ontario and beyond.

Pre-Clinical Research will be done at the ICR Discoveries Building at 290 Munro Street, and Translational Research (clinical trials) will be done at Thunder Bay Regional Health Sciences Centre.

The Science

The Thunder Bay Regional Research Institute will root its scientific program in Molecular Imaging and Advanced Diagnostics and Therapeutics (formerly the MMRC). Scientists and clinicians will work with academic and industry partners to develop tools to efficiently bring molecular imaging and advanced diagnostic technologies to patients in a research setting, enabling us to detect and treat cancer and other diseases at the earliest possible stage.

There are 3 Research Platforms (areas of focus) at the Research Institute:

- **Imaging Guided Interventions**, such as High-Intensity Focused Ultrasound (HIFU) can be used to improve imaging guided surgical procedures that result in better outcomes and faster recovery for patients. Dr. Laura Curiel, Dr. Samuel Pichardo and others will collaborate with Sunnybrook Research Institute's Dr. Kullervo Hynynen and industry partner Philips Healthcare to pioneer a new generation of commercial systems, the first of which is designed to eliminate uterine fibroids and lead to developments in cancer treatment.
- **Advanced Detection Devices**, including x-rays, PET and MRI imaging, can better detect small tumours in the body and improve surgical planning. Dr. John Rowlands, Dr. Alla Reznik

Background

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and others will work in the Advanced Detection Devices program initially applying this technology to the early detection of breast cancer by optimally combining x-ray and PET systems matched to the detection of very small cancers. To facilitate this research, a PET-CT system was installed at TBRHSC in June 2008.

- **Biomarker Exploration** allows a biomarker, or drug, to enter the body and seek out cancer cells at the molecular level. Using an MRI or other imaging tool, any cancerous cells that exist will light up, making early detection possible through non-invasive techniques. This also allows scientists to create customized therapies for individual patients.

The three Research Platforms are linked by a common focus: translating knowledge, generated in Thunder Bay and internationally, to clinical trials. In clinical trials the impact of new approaches will be tested and breakthrough concepts will be identified and developed worldwide. Clinical development time for imaging technology is shorter compared to the development of drug interventions, meaning patients experience the impact sooner.



What is HIFU?

HIFU is the acronym for High Intensity Focused Ultrasound, or high energy acoustic waves. When directed into the body these waves cause an intense heat that 'cook' cells, destroying tumours without invasive surgery. This means less discomfort and fewer side effects for patients, allowing for a shorter recovery time.

HIFU treatment is very precise; it can destroy tumours without harming surrounding tissues. It can also be repeated and combined with other therapies.