

Strategic Research Strengths at Western

Imaging

For more than 30 years, imaging strengths at Western University and throughout London, Ontario have grown from cohesive efforts to connect groups, institutions and platforms across various disciplines. This has resulted in Canadian leadership and one of the top imaging complements in the world. Since 2010, many of these city-wide strengths have been integrated under the banner of the **Biomedical Imaging Research Centre** at Western.

Biomedical Imaging Research Centre

- Aimed at discovery and development of innovative imaging techniques and instrumentation to improve the understanding, diagnosis and treatment of human diseases
- Covers all aspects of health, including cardiovascular, neurological, pediatric, musculoskeletal and oncology imaging, and image-guided surgery and basic science and engineering
- Partnership includes Western's Medical Imaging department, **Brain and Mind Institute**, **Lawson Health Research Institute**, **Robarts Research Institute** and the **London Regional Cancer Program**

Centre for Functional Metabolic Mapping

- Establishing anatomical, metabolic and functional characteristics of normal brain development and healthy aging across the lifespan
- Understanding the brain basis of developmental, neuropsychiatric and neurodegenerative deficits
- Established in 1994, housed the first commercially available ultra-high field MRI (4T) scanner in the world
- Houses Canada's only collection of high-field (3T human) and ultra-high field (7T human and 9.4T animal) MR systems

Brain and Mind Institute

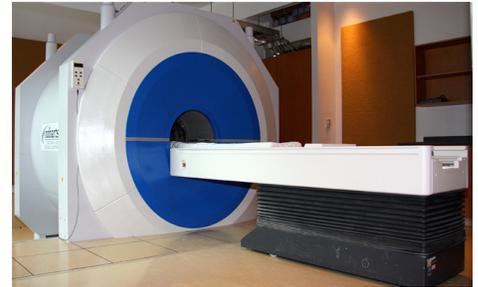
- International leader in cognitive neuroscience research, focused on understanding the neural basis of mental capacities and such processes as categorization, motor control, attention, self-awareness, language, memory, perception and reasoning
- More than 30 core members and 25 associate members across disciplines, including eight *Canada Research Chairs* and *Canada Excellence Research Chair*, Adrian Owen

Imaging Firsts

- Bone density test for osteoporosis pioneered in London in 1981
- Developed 3D-computed rotational angiography to see blood vessels in the brain, including aneurysms, in 1997
- Pioneered micro-CT system acquired by GE Healthcare in 2002
- World's first MRI image of a single cancer cell in a living animal in 2005, allowing for earlier detection of disease

Beyond Healthcare

- Imaging touches an increasing number of disciplines at Western, from wind and mummy imaging to art digitization and the **Computer Vision Research Group**
- New **Digital Recreation, Entertainment, Art, and Media** (DREAM) laboratory is home to researchers studying technological and artistic issues arising from design and development of video games



The 7-Tesla functional MRI system at Robarts Research Institute is the highest-field human MRI device in Canada.

Highlights:

- More than \$100 million in imaging infrastructure and more than 350 personnel, including nine Canada Research Chairs
- Recruited Adrian Owen from the University of Cambridge as *Canada Excellence Research Chair in Cognitive Neuroscience and Imaging*
- Spun-off seven companies and earned nearly 50 patents over the past decade
- \$34-million hybrid imaging infrastructure in London's hospital system
- Home to CSTAR, a national centre developing and testing minimally invasive surgical approaches, including robotics
- Nine *CIHR* and *NSERC* *Team grants* and *Strategic Training Programs* to attract and train the best graduate students



Western
Research