

Strategic Research Strengths at Western

Neuroscience/Brain & Mind

For the past 40 years, some of Western University's most internationally recognized research has been conducted in the field of neuroscience. From understanding childhood development to deciphering the neural basis for cognitive functions, Western cultivates an integrated approach to studies of the brain that bring together some of the most accomplished minds at the forefront of neuroscience research.

Clinical Neurological Sciences

- Rose to global prominence under the leadership of Dr. Henry Barnett and Dr. Charles Drake during the 1970s
- Canada's most comprehensive, multi-subspecialty centre for treating complex neurological disorders
- Sets international standards in all areas of research related to degenerative and neuromuscular disorders, spinal injury, stroke, aneurysms and brain tumours
- Uses highly advanced diagnostic and treatment technologies to investigate such disorders as Parkinson's disease, ALS and MS
- One of two Canadian centres equipped to treat complex epilepsy

The 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
- 30+ core and 25+ associate members, including 10 *Canada Research Chairs* and *Canada Excellence Research Chair*, Adrian Owen
- Home to Canada's only collection of high-field (3T human) and ultra-high field (7T human and 9.4T animal) MR systems
- Leadership led to recognition of the first Western Cluster of Research Excellence in Cognitive Neuroscience in 2014
- \$66M Canada Excellence Research Fund grant to establish BrainsCAN (2016), in partnership with McGill University

Canadian Action and Perception Network (CAPnet)

- Partnership between Western, Queen's, York, McGill and Montreal
- Seeks to understand how the brain works, especially for human movement control and perception, and for how disease and injury can disrupt these functions

Autism

- The multidisciplinary **Kilee Patchell-Evans Autism Research Group** is developing novel approaches to understand the symptoms, mechanisms and causes of autism
- Recent work on the possible role of gut bacterial metabolites in autism identified as one of Canada's top 50 scientific discoveries
- The *Endowed Academic Chair in Autism Studies*, held by Dr. Rob Nicolson, examines abnormal brain development in autistic children to understand the cause of the disorder and develop more effective treatments and interventions



Recruited from the University of Cambridge, Adrian Owen was the first to demonstrate patients believed to be in a 'vegetative state' may have cognitive thoughts.

Highlights:

- 40+ years of global leadership in neuroscience
- 100+ researchers engaged
- Lead \$66M BrainsCAN initiative through Canada First Research Excellence Fund
- One of the world's most comprehensive imaging suites, including one of three 7T fMRI systems for neurological use
- Global leadership in cognitive neuroscience through the Brain and Mind Institute, which has produced more than 1,000 leading papers over 15 years
- Postdoctoral exchange program with Cambridge University, King's College London and University College London



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