



**Western**  
**BrainsCAN**

Transforming brain research.

## RODENT COGNITION CORE

### RODENT MODELS OF COGNITION

Rodent models are essential for understanding the brain because they enable mapping from the molecular and cellular levels to cognition and behaviour. This is because many powerful new tools that enable characterization of molecular identity, anatomy and activity with cell-type specificity, plus the ability to drive and inhibit circuits that link to behaviour, are available in rodents. However, the application of these tools to impairments in high-level cognition—a defining feature of neurodegenerative disease—is still in its infancy. One reason is that measuring cognition and behaviour in rodent models, in a way that is directly relevant to subtle complexities of human cognition, is an immense challenge.

### RODENT COGNITION CORE

We have addressed this challenge by developing an innovative, touchscreen-based method that allows us to assess rodent models on similar—or identical—cognitive tests to those used in humans. The major goal of the BrainsCAN Rodent Cognition Core (RCC) is to build bridges across levels of neurobiological analysis by making this advanced cognitive assessment technology (and know how) available to researchers who do not have equipment or expertise in this area. A secondary goal of the RCC is to develop experimental platforms for understanding the role of brain circuits in cognition, which can then be used to test efficacy and delineate mechanisms of action of potential therapies for cognitive deficits. Each of these platforms consists of a mouse model that is demonstrated to have an impairment on a subset of cognitive tests, which can be ameliorated by a standard treatment.

The RCC is developing an active online community of touchscreen-researchers ([touchscreencognition.org](http://touchscreencognition.org)), to share information about state-of-the-art, touchscreen-based techniques for assessment of rodent cognition. A critical component of this community will be a new database, [MouseBytes.ca](http://MouseBytes.ca) that will provide a platform to upload and integrate cognitive data from labs across the world.

### Accelerator Projects

Development of a novel pharmaceutical to prevent noise-induced hearing loss

**Allman, Brian**

Using automated touchscreen tasks for cognitive assessment in the alpha-synuclein Parkinson's mouse model M83

**Beraldo de Paiva, Flavio Henrique**

Evaluating cognitive impairment and imaging and blood biomarkers in a mouse model of concussion

**Brown, Arthur**

The role of astrocytes in memory: Focus on pattern separation

**Bussey, Tim**

Recording neuronal activity using miniscopes in behaving genetically-modified mice

**Prado, Marco**

Role of microglia signaling in brain circuit development and cognition

**Prado, Vania**

Growing new dendritic spines to correct cognitive deficits of schizophrenia

**Rajakumar, Raj**

The impact of maternal immune activation on fetal brain development

**Renaud, Stephen**

Establishing a translational platform for studying sensory processing in neurodevelopmental disorders

**Schmid, Susanne**

Further information on BrainsCAN research can be found at [brainscan.uwo.ca](http://brainscan.uwo.ca)

The BrainsCAN Rodent Cognition Core is part of Western's \$66M BrainsCAN initiative, supported by the Canada First Research Excellence Fund (CFREF). The CFREF investment enables researchers at the University, along with their national and international academic and commercial partners, to seek answers to fundamental questions regarding how we learn, think, move and communicate.



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