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Western Interdisciplinary Research Building

The Brain and Mind Institute

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Western University

Western
The Brain and Mind Institute

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DIRECTOR'S STATEMENT

Western
The Brain and Mind Institute

DR. MELVYN GOODALE
Founding BMI Director

* PhD, FRSC, FRS
* Distinguished University Professor
* Canada Research Chair in Visual Neuroscience
* Director , The Brain and Mind Institute
* Member, CFREF Executive Committee
* Program Co-Director and Ivey Fellow, CIFAR: Azrieli Program in Brain, Mind & Consciousness
* Fellow of the Royal Society of Canada
* Fellow of the Royal Society of London
* Hellmuth Prize for Scientific Achievement

THE BRAIN AND MIND INSTITUTE IS A LEADING CANADIAN HUB FOR RESEARCH IN COGNITIVE NEUROSCIENCE

The BMI is a central and visible flagship for research in cognitive neuroscience at Western – and provides a clear signal to the international research community of Western's commitment to this signature area. But more importantly, it creates an environment that encourages the development of new ideas and research collaborations. The BMI has a highly visible presence internationally, and has been extremely competitive with respect to attracting research funds from both federal and provincial governments, and from international funding agencies.

This past year has been a particularly successful one for us. Western secured $22.5M from the federal government through the highly competitive Post-Secondary Institutions Strategic Investment Fund for the Western Interdisciplinary Research Building, soon to be the BMI's new home. Later in the year, Western was awarded $66M from the Canada First Research Excellence Fund. There is little doubt that the success of our proposal — BrainsCAN — was the direct result of Western's initial investment of $12.5M in the Cluster of Research Excellence in Cognitive Neuroscience and Western Chairs Program in 2014. It's no coincidence that all ten of the PIs in the BrainsCAN are members of the BMI.

THE BMI BRINGS RESEARCHERS TOGETHER

The BMI brings together researchers from 8 Faculties across the University, as well as the Robarts Research Institute, the Rotman Institute of Philosophy, and a number of hospitals across the city of London. The BMI's outstanding record of research has grown directly out of its commitment to collaborative investigation and willingness to absorb ideas from many different disciplines. Our trainees thrive in this environment and have developed a strong *esprit de corps* that is immediately evident at our frequent coffee mornings, journal club meetings, and social events.

The New Year will bring both opportunities as well as challenges as we move into the new building. I am confident, however, that the BMI will continue to flourish and that our standing on the international stage will become even more evident than it is today.

Dr. Melvyn A. Goodale, PhD, FRSC, FRS

BMI STEERING COMMITTEE
2017-2018 MEMBERS

Since 2013, the Brain and Mind Institute has been governed by a Steering Committee that meets on a monthly basis to discuss the development of policies and procedures for the institute, space allocation and the optimization of research resources, the selection of student and postdoctoral awardees, application reviews for BMI membership, and the preparation of the annual report. Terms of Reference for the Steering Committee and Meeting Minutes are available to view and download from the BMI website at https://www.uwo.ca/bmi/about/committees.html.

This committee consists of the BMI Director, six Core Members, and a representative from each of the following constituencies: Associate Members, graduate students, postdoctoral researchers, and administrative/technical staff.

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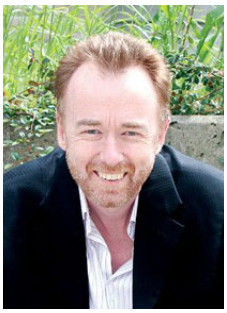

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COGNITIVE NEUROSCIENCE RESEARCH

AND THE BRAIN AND MIND INSTIUTE

OVERVIEW OF COGNITIVE NEUROSCIENCE

The study of the human brain is one of the most rapidly growing scientific enterprises of the 21st Century. The explosion in research linking neurobiology of the brain to complex human activities is not simply confined to the laboratory and to clinical applications, but has begun to inform fundamental questions about the nature of human consciousness and what it means to be human. Research on the relationship between the human brain and mind even influences our understanding of world economies and the behaviour of the marketplace – and promises to give us new insights into why some children, but not others, fail to flourish in the classroom. Not a day goes by without some sort of brain-related story appearing in major newspapers or other media outlets. Western has been a major contributor to these news headlines. In fact, over the past decade, Western has emerged as a leader in research on the relationship between brain and mind – a field known as ***Cognitive Neuroscience***.

All of this led to the creation of the Brain and Mind Institute (BMI) at Western in 2011.

THE BMI'S OBJECTIVES

- Accelerating research and research translation in cognitive neuroscience;
- Training highly qualified personnel;
- Forging national and international collaborations in cognitive neuroscience; and
- The facilitation of successful grant applications, both within the BMI and with other institutes and research groups at Western and beyond.

The BMI brings together research programs in cognitive neuroscience from across the campus -- programs that are already outstanding – and takes them to the next level by providing unparalleled research and training facilities. Since its inception, the BMI has been immensely productive; we have attracted substantial funding from provincial, federal, and international sources, and have been recognized as a successful research enterprise by both the scientific community and general public. We look forward to creating even more opportunities to foster research in cognitive neuroscience that is unmatched by any other research institute in the world.

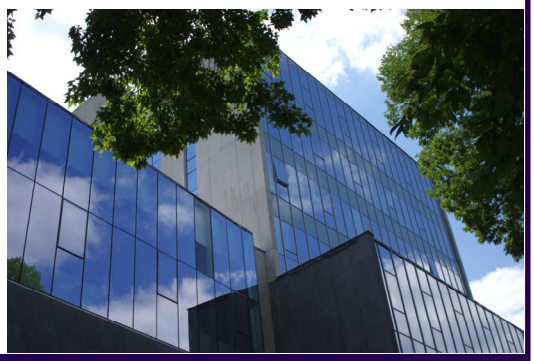
INTEGRATIVE APPROACH

Cognitive neuroscience is a new interdisciplinary endeavour that seeks an understanding of how the brain gives rise to mind. A range of disciplines – including psychology, linguistics, neurophysiology, neuroanatomy, artificial intelligence, computational theory, philosophy, economics, and anthropology – are all brought to bear on common problems of mind and brain. The success of future research in this challenging area relies on an integrative approach that bridges these more traditional disciplines.

THE FUTURE

There is little doubt that cognitive neuroscience with its emphasis on how the human mind emerges from the human brain will increasingly come to represent the central focus of all of neuroscience as the 21st Century continues to unfold.

Eric R. Kandel, M.D. 2000 Nobel Laureate



THE BRAIN AND MIND INSTITUTE

WORLD RENOWNED RESEARCH FACILITY

THE COMPOSITION OF THE BMI

One of the major reasons the BMI is successful is its interdisciplinary nature. By bringing together researchers from different disciplines to address fundamental questions about brain bases of human nature, the BMI has been able to move beyond typical research silos that characterize a significant portion of university-based research; moreover, the BMI has provided a clear focus for communicating Western's outstanding, and often ground-breaking, research in this field to the wider community – both in Canada and around the world.

The faculties, schools, and institutes at Western currently represented in the BMI include:

- **Arts & Humanities:** Philosophy
- **Education**
- **Engineering:** Electrical and Computer Engineering
- **Health Sciences**: Communication Sciences and Disorders, Kinesiology
- **Ivey Business School**: Marketing
- **Schulich School of Medicine & Dentistry:** Departments of Anatomy & Cell Biology, Clinical Neurological Sciences, Medical Biophysics, Ophthalmology, Physiology & Pharmacology, Psychiatry
- **Science**: Computer Science, Physics & Astronomy
- **Social Science:** Psychology

In addition, we draw a number of our core and associate members from other institutes including:

- **Robarts Research Institute**: Centre for Functional and Metabolic Mapping
- **Hospitals** across the city of London
- **Rotman Institute of Philosophy**

WHAT WE STUDY

Research at the BMI is focused on cognitive neuroscience – a new interdisciplinary endeavour aimed at understanding how it is that the brain allows us to perceive the world, make sense of what we see and hear, remember the past and plan for the future, communicate our thoughts to others, choose goals, plan actions and carry those actions out. We are also investigating how the brain allows us to interpret not only our own emotions and intentions but those of others as well – in short how it is that the 3 lbs of wetware inside our skulls creates consciousness and allows us to think.

Much of the research in cognitive neuroscience is directed at understanding what goes wrong when our cognitive abilities are compromised by disease, injury, and addiction – in diseases like Parkinson's, Alzheimer's, stroke, and concussion – and why sometimes cognitive abilities fail to develop properly in development disorders such as autism, dyslexia, and ADHD.

Having so many cognitive neuroscientists under one roof helps foster the kind of day-to-day interaction and interchange of ideas that characterizes successful research enterprises. Postdocs, grad students, and the BMI members themselves meet each other in the hallway and lounge – and new research ideas and collaborations grow naturally out of this coffee culture. In addition, by having many of our research facilities in a single location or close by we can share expensive equipment that might otherwise have to be duplicated if we were spread across the campus. This integrative research model will become even more evident when we move into the new WIRB.

RESEARCH FACILITIES

Researchers at the Brain and Mind Institute have access to laboratories that house specialized and cutting-edge technology.

Magnetic Resonance Imaging (MRI): The Centre for Functional and Metabolic Mapping, which is partnered with the BMI, houses three state-of-the-art brain scanners: a 9.4-Tesla system for studies in small animals, a 7-Tesla system for human and animal research, and a 3-Tesla system that is exclusively for human research. With this equipment, BMI researchers can measure the functional activity and connectivity in the brains of both animals and humans, including newborns.

Transcranial Magnetic Stimulation (TMS): Researchers can investigate the effects of stimulating a local region of the brain in a non-invasive way, and measure how this might affect activity elsewhere in the nervous system or interfere with performance on a specific task.

Measuring Eye and Body Movements: BMI houses sophisticated equipment for tracking eye and limb movements, during activity such as grasping an object, walking, or reading. Researchers can also track eye and hand movements as someone reaches for real objects while in a brain scanner.

Neurobiology of Sleep and Sleep Disorders: The BMI houses a fully-equipped 3-bedroom sleep lab with in-lab 32-channel EEG and polysomnographic systems for recording brain activity and other physiological signals while people are sleeping.

Animal Models of Cognition and Behaviour: Nonhuman primates, mice, rats, and other animals are used as models for the study of complex cognition in humans. Indeed, a number of researchers have parallel programs in humans and animals.

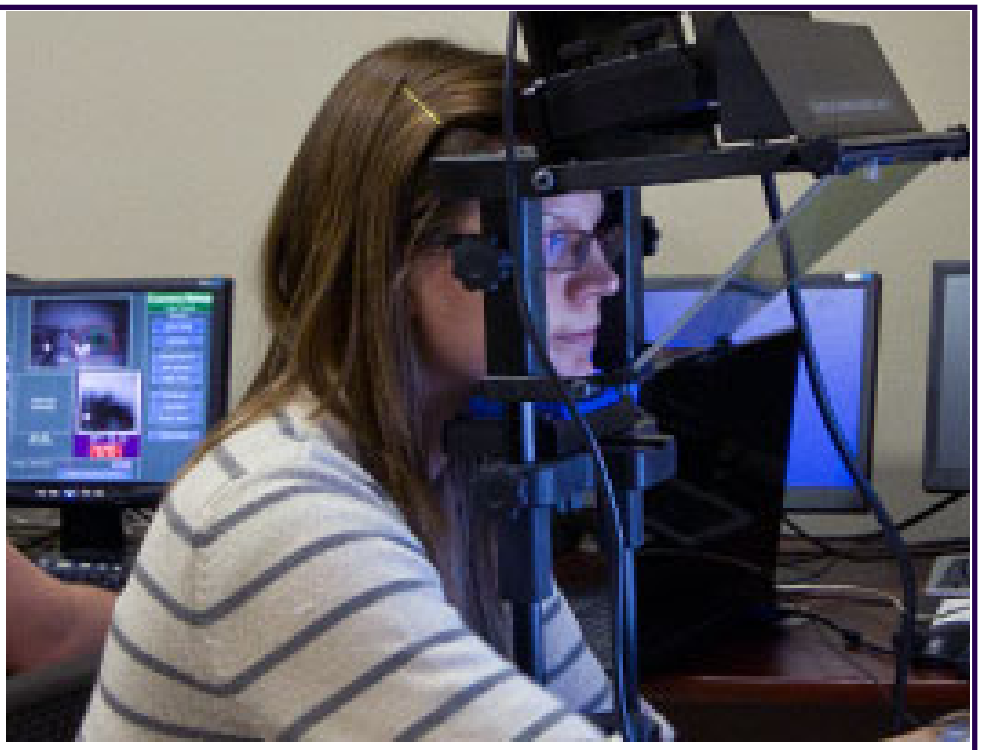
Computing Systems: Brain imaging technologies including EEG and MRI-based techniques yield many terabytes of data each year. The BMI has access to the high performance computing resources that are becoming increasingly necessary to handle these data as well as complex behavioural data.

BMI RESEARCHERS

Advances in cognitive neuroscience require new technology, cross-disciplinary collaboration and innovative methods for measuring the brain and behaviour. Western is home to exceptional researchers who raise the bar for cognitive neuroscience research, including:

- **Physicists**, who develop new brain imaging protocols and equipment;
- **Mathematicians**, who create new analysis methods and computational models of brain function;
- **Cognitive psychologists**, who construct models of the mind and design tasks that isolate particular mental processes;
- **Physicians** – from neurologists to neonatologists – who explore problems most commonly encountered by patients and integrate our growing knowledge of the brain into clinical practice;
- **Philosophers**, who answer new ethical questions and guide help guide the ontology of this new science;
- **Developmental psychologists**, who investigate how the brain grows and what can go wrong during childhood;
- **Cognitive physiologists**, who examine internal mental processes such as memory, perception learning and language; and
- **Computer scientists**, who run complex computer systems and engineers who build laboratory equipment to administer all manner of tasks.

Only by bringing all of these specialities together can the complexities of the brain and mind be better understood.



RESEARCH AND KNOWLEDGE TRANSFER

BMI core members have collectively published more than 3000 peer-reviewed papers during their research careers, with an average of more than 70 papers per investigator. BMI researchers are remarkably collaborative, which has resulted in many papers authored by more than one BMI member. In addition to publishing work in peer-reviewed journals, BMI researchers regularly present their research at leading national and international conferences and are routinely invited to give keynote addresses at such gatherings. All of this ensures BMI research is communicated to others working in this field, including industry and clinical settings.

BMI researchers engage end-users directly. One effective example of this comes from research related to the relationship between brain plasticity and education. BMI researchers who study the neural substrates of arithmetic reasoning and reading, routinely meet with educational practitioners and researchers in Western's Faculty of Education and relevant experts in local school boards to seek advice about particular problems encountered in the schoolroom that can then be investigated in the laboratory. As new findings emerge, researchers meet with curriculum developers in the Ministry of Education and with representatives from companies who design digital tools for education. This interactive cycle, from the classroom to the laboratory and back again, is a highly effective way to enhance evidence-based approaches to education – and ultimately to develop sound educational policy and practice.

Similar approaches are being used to determine how best to teach second languages, critical thinking, and a host of other skills. The interplay between new research in cognitive neuroscience and problems identified by potential end-users is particularly relevant as we move into a digital age where education and workplaces rely increasingly on the Internet, mobile technology, and other digital media tools.

TRAINING OPPORTUNITIES

The BMI is committed to training the next generation of researchers in cognitive neuroscience. It has created a number of new initiatives as the Postdoctoral Fellowship, the International Graduate Student Scholarship and various exchange programs with other institutes worldwide.

The Western Cognitive Neuroscience Postdoctoral Fellowships program provides up to five annual awards of $25,000 (matched by the supervisor) for each of two years and was created to help attract the best and the brightest young minds to the BMI.

The Western International Graduate Student Scholarship offers research opportunities to international graduate student s wishing to be mentored by BMI PIs.

Lastly, BMI has been diligently working on various exchange programs, with universities around the world including Radboud University, the University of Geneva and Monash University.

THE CHALLENGE

"The brain is a monstrous, beautiful mess. Its billions of nerve cells - called neurons - lie in a tangled web that displays cognitive powers far exceeding any of the silicon machines we have built to mimic it."

William F. Allman *Apprentices of Wonder. Inside the Neural Network Revolution*, 1989

MENTORING AND EDUCATION

Collectively, BMI researchers supervise more than 140 graduate students and 48 postdoctoral fellows, most of whom hold competitive salary awards, including Vanier Canada Graduate Scholarships and Banting Postdoctoral Fellowships awarded to Western. We have attracted talented graduate students and postdoctoral fellows from leading labs around the world, with backgrounds ranging from cognitive psychology to engineering. Part of the reason we have been successful is that we can provide trainees with access to state-of-the-art facilities for research in cognitive neuroscience, including imaging facilities that rank amongst the very best in the world. In addition to attracting young graduates from institutions across Canada, BMI researchers have recruited top talent from the United States, Australia, Israel, Spain, Albania, the UK, Italy, China, Japan, Taiwan, Lebanon, the Netherlands, and Germany. Our trainees routinely secure positions in leading universities across the globe.

As importantly, we have retained some of the best and the brightest of our trainees from overseas in Canada. Although the BMI is involved in supervision of graduate students across campus, the institute is not formally involved in undergraduate or graduate instruction. Nevertheless, we work closely with the Graduate Program in Neuroscience and other relevant graduate programs to develop new directions for graduate education geared towards trainees in cognitive neuroscience. The institute also works closely with departments across campus to ensure honors students have opportunities to do research at the BMI for their honors thesis. Many of these honors students and undergraduate student volunteers work closely with graduate students and postdoctoral fellows in the BMI.

INTERNATIONAL RESEARCH

International collaborations are key to taking research to the next level. Both collectively and individually, researchers at the BMI have well-established collaborations with researchers in many countries around the world, including the UK, China, Brazil, Australia, Kenya, and many countries in the EU. We have exchange schemes with the Monash Institute for Cognitive and Clinical Neuroscience in Australia, the Donders Institute for Brain, Cognition, and Behaviour in the Netherlands, and the Cognitive Neuroscience Group at the University of Geneva.

The BMI regularly welcomes researchers and trainees from around the world and has sponsored several international scientific meetings at Western and elsewhere in Canada.

PARTNERSHIPS AND RESEARCH COLLABORATIONS

The BMI also has excellent relationships with industry partners, including IBM Canada, CISCO, Siemens Canada, and Northern Digital Inc. BMI researchers are developing new approaches to brain analyses, human-machine interfaces, visualization graphics, and other projects that are of significant interest to these companies, and others in the private sector. Indeed, it is worth emphasizing that the range of possible partners who have a stake in issues central to research at the BMI is very large. These include computer hardware and software companies, the entertainment industry, military, professional sports, automakers interested in development of intelligent and self-driving cars, hotel chains (for whom sleep is an important commodity), companies making medical equipment, and manufacturers of video games and educational software.

WORKING TOGETHER

"Science is a field which grows continuously with ever expanding frontiers. Further, it is truly international in scope. … Science is a collaborative effort. The combined results of several people working together is often much more effective than could be that of an individual scientist working alone."

John Bardeen 1956 /1972 Nobel Laureate

INTERNATIONAL RELATIONSHIPS

The BMI knows that advances in cognitive neuroscience can be accomplished only with strong international relationships and interactions. For this reason, the BMI established an International Scientific Advisory Board to provide an arms-length review of the BMI's progress both in research and training and in establishing productive international collaborations.

INTERNATIONAL SCIENTIFIC ADVISORY BOARD

The BMI has created an International Scientific Advisory Board (ISAB), comprising some of the leading researchers in the field, to guide the institute in charting future directions for the development of cognitive neuroscience at Western. The following individuals have agreed to serve on this board and met for the first time on September 21, 2015, in concert with our BMI Fall Symposium that was held September 20, 2015. An external review of the institute was executed by the ISAB and a report was submitted to the University. This report emphasized the exceptional interdisciplinary collaborations in cognitive neuroscience and offered recommendations for BMI moving forward.

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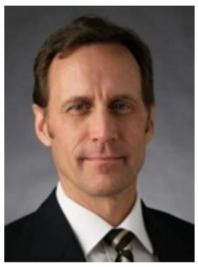

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Irene Tracey, PhD
Nuffield Professor of Anaesthetic Science
Director of the Oxford Centre for fMRI
University of Oxford, United Kingdom

BMI CORE MEMBERS

LEADING RESEARCHERS IN COGNITIVE NEUROSCIENCE

Faculty members from Western University who are actively engaged in cognitive neuroscience, whether basic or applied, are considered for core membership at the Brain and Mind Institute. Currently, there are 37 faculty members from various disciplines across campus, leading research activities at the Institute as Principal Investigators. The research activities they oversee are providing a better understanding of the neural bases of a range of mental abilities and deficits. BMI's Core Members and their teams study areas related to music, cognitive development, perception, emotions — and the list goes on.

For more information on the terms of reference for core members and how to apply for core membership at the Brain and Mind Institute, please visit the BMI website at www.uwo.ca/bmi.

MICHAEL ANDERSON

Lab: Anderson Lab

Dr. Michael Anderson is a professor and Chair in Philosophy in Science at the Rotman Institute of Philosophy. His research is located at the intersection of psychology, neuroscience, computer science, and the philosophy of cognitive science. Dr. Anderson's recent work outlines a novel framework for understanding the overall functional organization of the brain, places its function in evolutionary context, and demonstrates how mechanisms originally evolved for the support of sensory-motor coordination have been coopted to facilitate language and mathematics.

DANIEL ANSARI

Lab: Numerical Cognition Laboratory

Dr. Daniel Ansari is a Professor and Canada Research Chair in Developmental Cognitive Neuroscience in the Department of Psychology and the Brain and Mind Institute at the University of Western Ontario in London, Ontario, where he heads the Numerical Cognition Laboratory (www.numericalcognition.org). Daniel and his team explore the developmental trajectory underlying both the typical and atypical development of numerical and mathematical skills, using both behavioral and neuroimaging methods. He has a keen interest in exploring connections between cognitive psychology, neuroscience and education and served as the President of the International Mind, Brain and Education Society (IMBES) from 2014-16.

ROBERT BARTHA

Lab: Bartha Group

Dr. Robert Bartha is the Bank of Montreal Chair in Neuroimaging and a Professor of Medical Biophysics and a Robarts Scientist. Robert's expertise includes high and ultra-high field MRI and MRS methods development in patient populations and in animal models, working at 4T since 1996, 7T since 1999 and 9.4T since 2005. He has an extensive background in short-echo time MR spectroscopy acquisition and quantification and volumetric imaging acquisition and analysis. He has publications and grants with various team members in the areas of Alzheimer's disease, MCI, dementia and epilepsy.

TIM BUSSEY
Lab: TCNLab

Dr. Tim Bussey was recently hired as a Professor in Physiology and Pharmacology with a joint appointment in Psychiatry. He also is a Western Research Chair under the Western Cluster of Research Excellence in Cognitive Neuroscience. His research in cognition, with Dr. Lisa Saksida, has him asking questions on how the healthy brain does it, what goes wrong in neurodegenerative and neuropsychiatric disease, and identifying targets for therapy. Tim also works on improving preclinical-to-clinical translation.

BLAINE CHRONIK
Lab: Chronik Group

Dr. Blaine Chronik holds an NSERC Industrial Research Chair and heads the Western MR Systems Development Lab and a Professor in Physics. His team investigates mathematical transform algorithms for detection and correction of phase artefact in MRI, non-image-encoding local gradient coils, and MRI System Development. Current projects include work in the areas of field-cycled MRI (fcMRI), specialized gradient coil inserts, peripheral nerve stimulation in the MR environment, and eddy current modeling.

ADAM COHEN
Lab: SocialBrainLab

Dr. Adam Cohen is an Assistant Professor in Psychology. Adam's research focuses on how theory of mind and attention work, develop and interface using behavioural and neuroimaging methods.

BRIAN CORNEIL
Lab: Gaze Control Lab

Dr. Brian Corneil is a Professor in the Physiology and Pharmacology with a joint appointment in Psychology. His team seeks to understand how the brain controls movement. To understand such transformations, eye-head gaze shifts which rapidly change our line of sight are examined. In his lab, they combine neurophysiological and behavioural techniques in both humans and animal models.

JODY CULHAM
Lab: Culham Lab

Dr. Jody Culham is a Professor in the Psychology department and Neuroscience graduate program. Her lab uses neuroimaging (fMRI) and behavioral approaches to investigate how the human brain uses sensory information to perceive the world and guide hand actions such as reaching, grasping and tool use.

Jody was one of the first to use brain imaging techniques to discover and characterize human brain areas involved in hand actions. Her approach emphasizes using real-world stimuli (such as real objects instead of pictures) and real actions to better understand brain function under natural conditions, sometimes in contrast to artificial and virtual conditions.

MARK DALEY

Lab: Daley Lab

Dr. Mark Daley is Western's Associate Vice President, Research and an Associate Professor in Computer Science, Biology, and Statistics & Actuarial Science. He is also the SHARCNET Research Chair in Biocomputing and the Chairman of the board of directors for Compute Ontario. Mark specializes in natural computing, computational and mathematical modelling of biological systems, theoretical computer science, high performance computing for biology and mathematics, molecular evolution and algorithmics of music and the visual arts.

JÖRN DIEDRICHSEN

Lab: Motor Control Group

Dr. Jörn Diedrichsen is a Western Research Chair under the Western Cluster of Research Excellence in Cognitive Neuroscience and a Professor in Computer Science. In his motor control group, robotic devices are used to investigate human motor behavior to study how the brain recalibrates well-learned motor skills or acquires new ones. Computational models are then developed to understand the underlying control and learning processes. These insights are used to design fMRI studies to investigate how these processes map onto the brain.

STEFAN EVERLING

Lab: Laboratory for Neural Circuits & Cognitive Control

Dr. Stefan Everling is a Professor in Physiology and Pharmacology with a joint appointment in Psychology. Stefan's research aims to understand how frontal brain areas influence cognitive functions in the primate brain. By better understanding which areas underlie which cognitive functions, he works towards identifying the brain areas that can serve as targets for future treatment of prefrontal strokes and trauma.

MELVYN GOODALE

Lab: Goodale Lab

Dr. Mel Goodale is the Director of the Brain and Mind Institute, the Canada Research Chair in Visual NeuroScience and a Professor in Physiology and Pharmacology with a joint appointment in Psychology. Mel is best known for his work on the functional organization of the visual pathways in the cerebral cortex, and was a pioneer in the study of visuomotor control in neurological patients. His recent research uses functional magnetic resonance imaging (fMRI) to look at the activity in the normal human brain as it performs different kinds of visual tasks. He has also developed virtual-object technology to study the visual information used to program and control grasping movements.

JESSICA GRAHN

Lab: Music and Neuroscience Lab

Dr. Jessica Grahn is an Associate Professor in the Department of Psychology and has established herself as an emerging leader in the field of the neuroscience of music which combines her unique background as a classically trained concert pianist and her training as a neuroscientist. Jessica conducts brain scanning studies examining how different motor areas in the brain respond to musical rhythm. She is also interested in how rhythm and music may be processed in the brains of those who have dysfunction in the brain areas that control movement, as happens in Parkinson's disease.

PAUL GRIBBLE

Lab: Human Sensory Motor Neuroplasticity and Motor Learning

Dr. Paul Gribble is a Professor in Psychology and holds a joint appointment in Physiology and Pharmacology . Paul's research focuses on how the brain controls voluntary movement, and the relationship between neuroplasticity in sensory and motor brain areas and motor skill learning. Despite the significant mechanical complexities of multi-joint limb movement, humans are able to interact with the environment with remarkable ease. Research in the Gribble Lab is focused on understanding how the brain is organized to support motor learning, and how the central nervous system interacts with the complex peripheral neuromuscular plant to control skilled movement.

ELIZABETH HAYDEN

Lab: Personality and Emotion

Dr. Elizabeth Hayden is a Professor in the clinical area of Psychology. Her current research looks at characterizing the mechanisms by which temperament confers risk for mood disturbances, taking a perspective informed by developmental processes.

MARC JOANISSE

Lab: LRCN Lab

Dr. Marc Joanisse is a Professor in Psychology and the Neuroscience graduate program. He also holds an appointment as an Affiliated Scientist at Haskins Laboratories in New Haven Connecticut. In the Language, Reading and Cognitive Neuroscience Lab, Marc's research examines the neural underpinnings of first- and second-language learning in children and adults, with a special focus on the interplay between spoken and written language. This includes studying the brain bases of reading ability and disability across the lifespan, using a wide variety of experimental techniques including fMRI, ERP and eye-tracking.

INGRID JOHNSRUDE

Lab: CoNCH Lab

Dr. Ingrid Johnsrude is a Western Research Chair under the Western Cluster of Research Excellence and holds joint Professor appointments in Psychology, and in the School of Communication Sciences and Disorders. In Ingrid's Cognitive Neuroscience of Communication and Hearing (CoNCH) lab, psychophysical and neuroimaging methods such as fMRI and EEG are used to study the neural basis of hearing; particularly how the brains of listeners transform the noisy and variable sounds of everyday conversations into meaningful language. The ultimate goal of this work is to make speech listening easier for people with hearing impairment. The group is also exploring novel functional-imaging based methods for evaluation of subtle brain abnormalities in epilepsy, concussion and other brain disorders.

ALI KHAN

Lab: Khan Computational Imaging Lab

Dr. Ali Khan is a an Assistant Professor and scientist at the Robarts Research Institute. Ali and his lab group focus on the development of computational methods to enhance medical imaging processes, particularly those related to determining the role of the hippocampus in epilepsy. His group develops and applies sophisticated image processing and analysis techniques to extract, quantify, and distill information from medical images, ultimately leading to more accurate diagnoses and more precise surgical interventions. Ali's multi-disciplinary research spans across several domains, with applications in epilepsy, cancer, cardiovascular disease, and neuroscience.

STEFAN KÖHLER

Lab: Köhler Memory Lab

Dr. Stefan Köhler is a Professor in Psychology. The research in his Memory Lab in Cognitive Neuroscience focuses on the functional and neuroanatomical organization of memory in the human brain. Questions pursued by his lab include how memory systems interact with the visual system, how memory and affect interact, and whether different parts of the brain support memory for different types of information.

STEPHEN LOMBER

Lab: Cerebral Systems Lab

Dr. Stephen Lomber is a Canada Research Chair (Tier I) in Brain Plasticity and Development, and a Professor in Psychology, Physiology and Pharmacology. In addition, Steve holds an appointment as a principal investigator in the National Centre for Audiology in the Faculty of Health Sciences. Steve's lab uses an integrated approach of psychophysics, electrophysiological recording, neuro-anatomical techniques, and functional imaging to examine processing in auditory cortex. Work in the lab examines cortical plasticity in the presence and absence of acoustic input, and following the initiation of auditory processing through the means of cochlear prosthetics.

PENNY MACDONALD

Lab: MacDonald Lab

Dr. Penny MacDonald is a Canada Research Chair (Tier II) in Cognitive Neuroscience and Neuroimaging, as well as a Movement Disorders Neurologist and an Assistant Professor in Clinical Neurological Sciences. She is cross-appointed in Physiology and Pharmacology, and Psychology. Penny's research aims to understand the nature and causes of *cognitive* deficits such as learning, memory, and thinking problems that are increasingly recognized in more than 50% of PD patients. Deficits in cognition disproportionately cause a decline in quality of life for patients with PD, and are a frequent cause of institutionalization. Clarifying these deficits and the changes in brain function that underlie them is therefore critical.

SCOTT MACDOUGALL-SHACKLETON

Lab: AFAR

Dr. Scott MacDougall-Shackleton is the Department Chair of Psychology and a Professor in Psychology. Research in Scott's lab is broadly integrative. His team combines field and laboratory studies, and research ranges from population-level studies to individual behaviour to molecular biology. Their main goal is to understand how the mechanisms of behaviour have been shaped by natural selection. Scott's team focuses on songbirds because of their phenotypic diversity, behavioural complexity and well-studied physiology and neurobiology.

JULIO MARTINEZ-TRUJILLO

Lab: Cognitive Neurophysiology Laboratory

Dr. Julio Martinez-Trujillo is appointed to the position of Provincial Endowed Academic Chair in Autism, Schulich School of Medicine & Dentistry and is a Professor in Psychology and the Neuroscience graduate program. Julio's research aims to understand the mechanisms of cognition and behaviour in the normal brain and during disease, focusing on how the brain transforms visual signals into coordinated behaviour and how this process is influenced by cognitive functions, such as attention and memory.

KEN MCRAE

Lab: McRae Lab

Dr. Ken McRae is Associate Dean Research in the Faculty of Social Science and a Professor in Psychology. His research is focused on how people represent, understand, and use abstract concepts. Ken is investigating how such concepts are processed in the mind and brain. His most recent research approaches abstract concepts from the perspective that the real-life situations in which people experience these concepts are central to their representation and processing.

RAVI MENON

Lab: Menon Group

Dr. Ravi Menon is the Director of the Centre for Functional and Metabolic Mapping (CFMM), a Professor in Medical Biophysics, Medical Imaging, Neuroscience, and Psychiatry, Co-Scientific Director for BrainsCAN, and holds an appointment as the Canada Research Chair in Functional and Molecular Imaging. Ravi's research centres around the application of ultra-high field MRI to problems in neuroscience. Towards this end, his group is developing new radio frequency coil hardware to improve the homogeneity of the images in conjunction with software techniques to speed up the image acquisition. Utilizing these advancements, his team are studying the biophysical basis of the functional MRI signal which is used in all modern day cognitive and clinical neuroscience as well as developing MRI methods such as quantitative susceptibility mapping for use in the early diagnosis and monitoring of multiple sclerosis.

PAUL MINDA

Lab: The Categorization Lab

Dr. John Paul Minda is an Associate Professor in Psychology. His innovative research works to answer questions about how and why humans organize information into categories and concepts and how the resulting conceptual structure influences thinking and behaviour. This work extends into research on expert performance, complex learning, and understanding the neuro-cognitive effects of mindfulness meditation practice.

DEREK MITCHELL

Lab: Emotional Cognition Lab

Dr. Derek Mitchell is an Associate Professor in Psychiatry, Anatomy and Cell Biology, and Psychology. One line of Derek's research focuses on how impairments in the way the brain processes emotions of others may be associated with antisocial behaviours such as aggression. Other laboratories have found that directing attention to critical social cues alleviates the emotional expression recognition deficits often found in populations of individuals with high levels of antisocial behaviour. It remained unclear, however, whether this improvement in recognition is accompanied by elevated feelings of empathy (likely a more important determinant of rehabilitation and prosocial behaviours).

J. BRUCE MORTON

Lab: Cognitive Development and

Dr. Bruce Morton serves as an Associate Professor in Psychology and is a faculty member of the graduate programme in Neuroscience. Bruce's research interests concern the development of cognitive control and its association with changes in prefrontal cortex function. One of the foremost challenges for young children is organizing their thoughts and actions in the service of achieving long-term goals. Children find it difficult to defer small immediate rewards in favor of larger future rewards for example, or to switch the focus of their attention from one feature of a stimulus to another. The development of such self-regulatory capacities is an important foundation for later academic, social, and health-related outcomes, and is therefore the focus of many basic and applied research programs.

ADRIAN OWEN

Lab: Owen Lab

Dr. Adrian Owen is the Canada Excellence Research Chair in Cognitive Neuroscience and Imaging and a Professor in Psychology, Anatomy and Cell Biology, Physiology and Pharmacology. His research combines neuroimaging (MRI and EEG), with cognitive studies in brain-injured patients and healthy participants. His team studies patients who have sustained brain injuries that result in disorders of consciousness. They also study patients with neurodegenerative diseases in order to understand more about the causes and consequences of the memory, perception and reasoning problems that many of them experience. Finally, they develop web-based tools for the assessment of cognitive function, both in healthy participants and in patients with disorders of the brain.

ANDREW PRUSZYNSKI

Lab: Pruszynski Lab

As Canada Research Chair (Tier II) in Sensorimotor Neuroscience and an Assistant Professor in Physiology and Pharmacology and Psychology, Dr. Andrew Pruszynski studies the neural mechanisms or reaching, grasping and object manipulation. By learning how various parts of the nervous system work together when generating skilled movement of the arm and hand, Andrew's team strive to find better treatments for recovering hand and arm function following peripheral nerve injury, spinal cord injury, and stroke.

LISA SAKSIDA

Lab: TCNLab

Dr. Lisa Saksida is a Professor in Physiology and Pharmacology with a joint appointment in Psychology. She is also the Co-Scientific Director for BrainsCAN. Her research in cognition, with Dr. Tim Bussey, has her asking questions on how the healthy brain carries out cognitive operations, what goes wrong in neurodegenerative and neuropsychiatric disease, and identifying targets for therapy. Lisa also works on improving preclinical-to-clinical translation.

SUSANNE SCHMID

Lab: The Schmid Lab

Dr. Susanne Schmid is an Associate Professor in Anatomy and Cell Biology, and the Associate Dean for Graduate and Post-doctoral Studies. Susanne and her lab group studies mechanisms underlying normal sensory filtering and sensory filtering disruptions in animal models of schizophrenia and autism. Two operational measures are used for sensory filtering in order to study the underlying mechanisms: habituation and prepulse inhibition of startle.

DAVID SHERRY

Lab: AFAR

Dr. David Sherry is a Professor in Psychology. His research focuses on evolution and neurobiology of memory and spatial orientation. David works with food-storing black-capped chickadees and brood-parasitic brown-headed cowbirds examines spatial memory and the functional neuroanatomy of the avian hippocampus. By examining the brain and behaviour of birds, one can observe how evolutionary change in memory and other cognitive functions occurs, and observe the relation between evolutionary change in behaviour and evolutionary change in the brain.

ANDREA SODDU
Lab: Soddu Lab

Dr. Andrea Soddu is an Assistant Professor in Physics, where he investigates spontaneous brain activity using fMRI, global metabolism and structural connectivity using diffusion tensor imaging in patients with disorders of consciousness, hypnosis, anesthesia, tinnitus and dementia.

RYAN STEVENSON
Lab: Stevenson Lab

Dr. Ryan Stevenson was recently hired as an Assistant Professor in Psychology. His lab's research focuses on how visual and auditory perception influence high-order cognitive processing, whether in the autism spectrum or in cochlear implant users.

BRIAN TIMNEY
Lab: Timney Lab

Dr. Brian Timney is a Professor Emeritus in Psychology and recently oversaw the Faculty of Social Science as Dean. There are three areas of research conducted in his lab:

1. The effect of alcohol on vision,
2. The temporal characteristics of human binocular vision, and
3. Comparative studies of vision in horses and camels.

TUTIS VILIS
Lab: Vilis Lab

As Professor Emeritus, Dr. Tutis Vilis explores the function of two important cortical areas—the ventral stream, which specializes in the perception of visual objects and the dorsal stream, which specializes in directing motor actions. He has been a pioneer in the development of on-line teaching modules in physiology and neuroscience.

For more information on the BMI Core Members, including contact information, please visit:
http://www.uwo.ca/bmi/members/core_members.html.

BMI ASSOCIATE MEMBERS

The BMI also engages with other members of the Western community, including research scientists and Principal Investigators in clinical departments. For more information on current associate members, visit www.uwo.ca/bmi/members/associate_members.html.

Lisa Archibald	Communication Sciences and Disorders
Corey Baron	Medical Biophysics
Tim Bayne	Rotman Institute of Philosophy
Janis Cardy	Communication Sciences and Disorders, National Centre for Audiology
Sandrine de Ribaupierre	Clinical Neurological Sciences
Derek Debicki	Clinical Neurological Sciences
Mathias Dietz	School of Communication Sciences & Disorders, National Centre for Audiology
Neil Duggal	Clinical Neurological Sciences
Roy Eagleson	Electrical & Computer Engineering
Elizabeth Finger	Clinical Neurological Sciences
Stuart Fogel	Psychology
Alexander Fraser	Clinical Neurological Sciences, Ophthalmology
Elizabeth Hampson	Psychology
Matthew Heath	Kinesiology
Erin Heerey	Psychology
Kevin Johnston	Psychology, Physiology & Pharmacology
Angela Mendelovici	Rotman Institute of Philosophy
Lindsay Nagamatsu	Kinesiology
Lena K. Palaniyappan	Psychiatry, Medical Biophysics, Neuroscience
Rajni Patel	Electrical & Computer Engineering, CSTAR, Clinical Neurological Sciences, Surgery, Biomedical Engineering
Terry Peters	Medical Imaging, Medical Biophysics, Biomedical Engineering
David Purcell	Communication Sciences & Disorders
Marie Y. Savundranayagam	School of Health Sciences
Kevin Shoemaker	Kinesiology, Physiology & Pharmacology
Rob Stainton	Rotman Institute of Philosophy
Jackie Sullivan	Rotman Institute of Philosophy
Jennifer Sutton	Psychology, Brescia University College
Robert Teasell	Physical Medicine and Rehabilitation, Parkwood Institute Research
Chris Viger	Rotman Institute of Philosophy
Charles Weijer	Rotman Institute of Philosophy

ADMINISTRATIVE AND TECHNICAL CORE

Florence Lourdes	Administrative Officer
Denise Soanes	Secretary and Receptionist
Haitao Yang	Systems Manager and Software Engineer

BMI NEWS HIGHLIGHTS IN 2017

BMI member Mark Daley, along with researchers associated with Western, have been fine-tuning a test that can determine if a person has suffered a concussion, with a 90-per-cent accuracy rate. The objective is to provide trainers with the tools needed to assess the risk of repetitive brain trauma.

The Donders Institute (DI) at Radboud University and the Brain and Mind Institute (BMI) at Western University have selected Chao Gu (PhD student - Corneil Lab, Robarts), Kathryn Manning (PhD student - Menon Lab, Robarts) and Molly Henry (Postdoctoral Fellow - Grahn Lab) to participate in collaborative research at Radboud University under the DI-BMI Trainee Exchange Programme.

Western researchers, including three BMI scientists, have collaborated with an international research team to develop a new brain scan analysis that will better treat head injuries.

L'Oréal and UNESCO recognized BMI postdoctoral researcher, Lorina Naci from Adrian Owen's lab, for her outstanding contribution to science. Since 1998, the L'Oréal-UNESCO For Women in Science programme has highlighted the achievements of outstanding women scientists and supported promising younger women who are in the early stages of their scientific careers.

Molly Henry, from Jessica Grahn's Music and Neuroscience Lab, was named a 'Rising Star' by the Association for Psychological Science (APS). The Association for Psychological Science Rising Star Award identifies outstanding psychological scientists in the earliest stages of their research career post-PhD.

The Beal Robotics Team 5024 successfully finished qualification matches ranked 1st overall (out of 35 teams) and were the captains of the winning alliance for the inaugural robotics competition at Western University. In addition, the team was also recognized and received the highest award possible, the Chairman's Award. This award honours the team that best represents a model for other teams to emulate and best embodies the purpose and goals of FIRST. The Brain and Mind Institute is a proud sponsor of Beal's Outreach robotics program as it fosters an interest in Neuroscience among High School students.

BMI Trainees—Bailey Brashears (Minda lab), Sudesna Chakraborty (Köhler lab), Maryam Nouri Kadijani (Martinez-Trujillo lab), and Adrian Sardinas (Ansari lab) - have been awarded International Graduate Student Scholarships through Western's Cognitive Neuroscience Cluster Fund for Excellence. This scholarship supports up to 4 international graduate students by helping to offset the differential in international (as compared to domestic) tuition and fees.

The Sound of Science @soundofsci.org is a radio show featuring Western faculty and student researchers making ground breaking discoveries in scientific research. The first episode titled "Across the Synapse" featured three professors from the Brain and Mind Institute—Daniel Ansari, Ingrid Johnsrude, and Stefan Köhler—who shed some light on the wonders of the human brain.

Tamara Tavares, a Graduate student in Derek Mitchell's Emotional Cognition Lab at the Brain and Mind Institute, took first place in the 6th Annual Three Minute Thesis (3MT) Competition on Wednesday, April 5, 2017. The competition is a great opportunity for research students' to develop their presentation and communication skills and to also develop their capacity to explain their research in language appropriate to an intelligent but non-specialist audience.

NSERC CRSNG

Several BMI Core Members and Associate Members who were successful applicants for NSERC & SSHRC awards.
NSERC Discovery: Daniel Ansari, Blake Butler, Melvyn Goodale, Matthew Heath, Ingrid Johnsrude, Julio Martinez-Trujillo, and Ryan Stevenson
NSERC RTI: Jody Culham and Janis Cardy **SSHRC Insight:** Ryan Stevenson

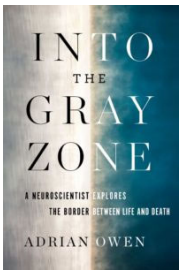
Brian Corneil, a professor in the department of physiology and pharmacology, a Robarts scientist and a Core Member of the BMI, was recognized along with 10 others from across the University for significant achievements in teaching and research.

BMI Associate member, Dr. Lena Palaniyappan, received the Young Investigator Award from the Canadian College of Neuropsychopharmacology (CCNP). The award recognizes outstanding contributions in neuro psychopharmacology by a young basic scientist or clinical investigator in Canada.

Stefan Köhler, a Psychology researcher and BMI core member, had published an article on the current understanding of neural mechanisms of episodic memory in the May issue of the German subsidiary of Scientific American called Gehirn & Geist (translation: Brain & Mind).

Niki H. Kamkar and J. Bruce Morton of Western's department of Psychology and Brain and Mind Institute are exploring how adolescents experiencing tough times are more likely motivated by small instant incentives. This correlation between adversity and sensitivity to rewards, impacts the level of impulsivity in pre-teens and risk of mental health problems later on.

BMI Director, Dr. Mel Goodale, along with Tzvi Ganel of Israel's Ben-Gurion University, are studying the effect smiling has on age perception and the judgements made based on facial expression.



'Into the Gray Zone', written by Western Neuroscientist and BMI member Adrian Owen, explores the spaces in between life and death for people in a vegetative state. Dr. Owen captured international medical and media attention when he found through fMRI scans that 20 per cent of these non-responsive patients may, in fact, be conscious and able to lay down new memories.

BMI scientists Jessica Grahn and Stephen Lomber, from Western's Psychology department, were named Fellows of the Association for Psychological Science (APS). APS is a leading international organization dedicated to advancing scientific psychology across disciplinary and geographic borders.

aps
ASSOCIATION FOR PSYCHOLOGICAL SCIENCE

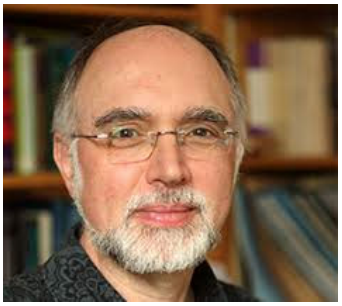
BMI's Adrian Owen, along with Cambridge Brain Sciences, is leading the largest known study on how sleep deprivation effects the brain and cognitive abilities. The testing, to record different types of thinking over a three day period, is conducted entirely online at www.worldslargestsleepstudy.com.

BMI Postdoctoral Fellow Molly Henry, along with other Western researchers, are studying how people focus on single conversations and why seniors struggle with following conversations in noisy rooms. This study is published in Nature Communications - an open access, multidisciplinary journal dedicated to publishing high-quality research in all areas of the biological, health, physical, chemical and Earth sciences.

Dr. Ingrid Johnsrude, Western's Research Chair and BMI core member, was appointed to the NSERC Biological Systems and Functions Evaluation Group for a 3-year term.

Co-Scientific Director of BrainsCAN and BMI researcher, Dr. Lisa Saksida, received a federal CRC appointment in Translational Cognitive Neuroscience (Tier 1). The Chairs program has been designed to encourage and promote top research and innovation in universities. Tier 1 Chairs are awarded $200,000 annually for seven years to fund their research and are awarded to outstanding researchers who have developed reputations as world leaders in their fields.

The *Scholars to Leaders Speaker Series* is a unique initiative of the School of Graduate and Postdoctoral Studies that is open to all students and scholars across all careers at Western. The monthly luncheon events showcase guest speakers who share valuable insight and expertise on critical aspects of leadership from their own career experiences. On **Wednesday, September 27**, BMI Founding Director, Dr. Melvyn Goodale, spoke about *Fifty Years at Western: A Personal History*.



The Brain and Mind Institute hosted its first **Distinguished Speaker** visit on October 19, 2017. **Dr. Robert Zatorre** from Montreal Neurological Institute, McGill University, delivered a talk to a full room about *"Why do we love music? A view from cognitive neuroscience".*

The WIRB is a 120,000-square-foot facility that serves as the new home for the Brain and Mind Institute, BrainsCAN and the Rotman Institute of Philosophy, as well as five mixed-use general classroom spaces. The BMI's main office , along with its human cognition and sensorimotor research facilities have moved from the Natural Science Centre to the Western Interdisciplinary Research Building (WIRB) effective December 31, 2017.

For more BMI news stories, see:

http://www.uwo.ca/bmi/news/bmi_news/past_news.html

GRANTS HELD
BY BMI MEMBERS IN 2017

Funding Source	Core Members	Associate Members	Total *
Brain Canada	979,825	0	979,825
Canada Research Chairs	1,027,000	633,333	1,660,333
Canadian Centre Aging & Brain Health Researcher	0	199,657	199,657
CERC	1,050,000	0	1,050,000
CFI IOF	74,036	0	74,036
CFI LEF	657,272	0	657,272
CFREF Awards	819,414	239,500	1,058,914
CFREF Core s	4,219,000	0	4,219,000
CIFAR	315,658	0	315,658
CIHR Foundation Scheme	965,000	658,698	1,623,698
CIHR Operating	1,615,803	378,803	1,994,606
CIHR Project	557,395	78,305	635,700
CIHR Other	236,570	16,025	252,595
Industrial Research Chair—Synaptive Med Inc.	300,000	0	300,000
MITACS Inc.	0	110,000	110,000
Networks of Centre s of Excellence	0	106,400	106,400
NSERC Discovery	1,320,738	365,000	1,6857,38
NSERC Other	486,562	25,000	511,562
Ontario Brain Institute	278,586	33,335	311,921
Ontario Research Fund	457,272	0	457,272
SSHRC	165,609	35,006	200,615
Other	2,197,850	312,148	2,509,998
Total	**17,723,590**	**3,191,210**	**20,914,800**

*Total amount over all tenure years of grants held in 2017 at Western University by lead PI

PUBLICATIONS 2017

BMI CORE MEMBERS IN BOLD

Peer-reviewed Papers

1. **Anderson, M.L.** (2017). *Of Bayes and bullets: An embodied, situated, targeting-based account of predictive processing*. In: T. K. Metzinger and Wanja Wiese, eds. Philosophy and Predictive Processing, ch. 4. Frankfurt am Main: MIND Group.
2. **Anderson, M.L.** & Chemero, A. (2017). *The brain evolved to guide action.* In S. V. Shepherd (ed.). The Wiley Handbook of Evolutionary Neuroscience, pp. 1-20.
3. Sokolowski, H.M., Fias, W., Ononye, C., & **Ansari, D.** (2017). *Are numbers grounded in a general magnitude processing system? A functional neuroimaging meta-analysis*. Neuropsychologia, 105:50-69.
4. Leibovich, T. & **Ansari, D.** (2017). *Accumulation of non-numerical evidence during non-symbolic number processing in the brain: an fMRI study.* Human Brain Mapping, 38(10): 4908-21.
5. Matejko, A. & **Ansari, D.** (2017). *How do individual differences in children's domain specific and domain general abilities relate to brain activity within the intraparietal sulcus during arithmetic? An fMRI study.* Human Brain Mapping, 38(8), 3941-56.
6. Vogel, S.E., Goffin, C., Bohnenberger, J., Koschutnig, G., Reishofer, G., Grabner, R.H., & **Ansari, D.** (2017). *The left intraparietal sulcus adapts to symbolic number in both the visual and auditory modalities: evidence from fMRI.* NeuroImage, 153: 16-27.
7. Leibovich, T., Alrubaiey, S., & **Ansari, D.** (2017). *Beyond comparison: The influence of physical size on number estimation is modulated by notation, range and spatial arrangement.* Acta Psychologica, 175: 33-41.
8. Xenidou-Dervou, I., Molenaar, D., **Ansari, D.**, van der Schoot, M., & van Lieshout, E.C.D.M. (2017). *Nonsymbolic and symbolic magnitude comparison skills as a longitudinal predictors of mathematical achievement.* Learning and Instruction, 50, 1-13.
9. Sokolowski, H.M., Fias, W., Mousa, A., & **Ansari, D.** (2017). *Common and distinct brain regions in both parietal and frontal cortex support symbolic and nonsymbolic number processing in humans: A functional neuroimaging meta-analysis.* NeuroImage, 146, 376-394.
10. Montero-Odasso, M.M., Pieruccini-Faria, F., **Bartha, R.**, Black, S.A., Finger, E., Freedman, M., Greenberg, B., Grimes, D.A., Hegele, R.A., Hudson, C., Kleinstiver, P.W., Lang, A.E., Masellis, M., McLaughlin, P.M., Munoz, D.P., Strother, S., Swartz, R.H., Symons, S., Tartaglia, M.C., Zinman, L., & Strong, M.J., ONDRI Investigators, W McIlroy. (2017). *Motor phenotype in neurodegenerative disorders: Gait and balance platform study design protocol for the Ontario Neurodegenerative Research Initiative (ONDRI).* Journal of Alzheimer's Disease, 59(2):707-721, July 2017. PMID: 28671116.
11. Montero-Odasso, M.M., Sarquis-Adamson, Y., Speechley, M., Borrie, M.J., Hachinski, V.C., Wells, J., Riccio, P.M., Schapira, M., Sejdic, E., Camicioli, R.M., **Bartha, R.**, McIlroy, W.E., & Muir-Hunter, S. (2017). *Association of dual-task gait with incident dementia in mild cognitive impairment: Results from the gait and brain study.* JAMA Neurology, 74(7):857-865, July 2017. PMID: 28505243.
12. Kazemifar, S., Manning, K., Rajakumar, N., Gomez, F.A., **Soddu, A.**, Borrie, M.J., **Menon, R.S.**, & **Bartha, R.** (2017). *Spontaneous low frequency BOLD signal variations from resting-state fMRI are decreased in Alzheimer disease.* PLoS One, 12(6):e178529, June 2017. PMID: 28582450.

13. Snir, J.A., Suchy, M., Bindseil, G.A., Kovacs, M., **Chronik, B.A.**, Hudson, R.H.E., Pasternak, S.H., & **Bartha, R.** (2017). *An Aspartyl Cathepsin targeted PET Agent: Application in an Alzheimer Disease Mouse Model.* In Press: Journal of Alzheimer's Disease, 17-0115R3, 23 October 2017.

14. Aleksanderek, I., Stevens, T.K., Goncalves, S., **Bartha, R.**, & Duggal. N. (2017). *Metabolic and functional profile of cervical spondylotic myelopathy patients.* Journal of Neurosurgery, 26(5):547-553, May 2017. PMID: 28156205.

15. Farhan, S.M., **Bartha, R.**, Black, S.E., Corbett, D., Finger, E., Freedman, M., Greenberg, B., Grimes, D.A., Hegele, R.A., Hudson, C., Kleinstiver, P.W., Lang, A.E., Masellis, M., McIlroy, W.E., McLaughlin, P.M., Montero-Odasso, M., Munoz, D.G., Munoz, D.P., Strother, S., Swartz, R.H., Symons, S., Tartaglia, M.C., Zinman, L., & ONDRI Investigators. (2017). *The Ontario Neurodegenerative Disease Research Initiative (ONDRI).* The Canadian Journal of Neurological Sciences, 44(2):196-202, March 2017. PMID: 28003035.

16. Aleksanderek, I., McGregor, S.M., Stevens, T.K., Gonvalves, S., **Bartha, R.**, & Duggal, N. (2017). *Cervical spondylotic myelopathy: Metabolite changes in the primary motor cortex after surgery.* Radiology, 282(3):817-825. PMID: 27689923.

17. Horner, A.E., McLaughlin, C., Afinowi, N.O., **Bussey, T.J.**, **Saksida, L.M.**, Komiyama, N.H., Grant S.G.H., & Kopanitsa M.V. (2017). *Enhanced cognition and dysregulated hippocampal synaptic physiology in mice with a heterozygous deletion of PSD-95.* European Journal of Neuroscience, Dec 13 2017. DOI: 10.1111/ejn.13792. https://onlinelibrary.wiley.com/doi/abs/10.1111/ejn.13792.

18. Phillips, B.U., Lopez-Cruz, L., Hailwood, J., Heath, C.J., **Saksida, L.M.**, & **Bussey, T.J.** (2017). *Translational approaches to evaluating motivation in laboratory rodents: conventional and touchscreen-based procedures.* Current Opinion in Behavioral Sciences., vol 22 21-27, Aug 2017. DOI: 10.1016/j.cobeha.2017.12.008 https://www.repository.cam.ac.uk/handle/1810/273928.

19. Benevento, M., Oomen, C.A., Horner, A.E., Amiri, H., Jacobs, T., Pauwels, C., Frega, M., Kleefstra, T., Kopanitsa, M.V., Grant, S.G.N., **Bussey, T.J.**, **Saksida, L.M.**, Van der Zee, C.E.E.M., van Bokhoven, H., Glennon, J.C., & Kasri, N.N. (2017). *Haploinsufficiency of EHMT1 improves pattern separation and increases hippocampal cell proliferation.* Nature: Scientific Reports, 7, 40284. DOI: 10.1038/srep40284 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5223204/pdf/srep40284.pdf.

20. Attaran, A., Handler, W.B., **Menon, R.S.**, & **Chronik, B.A.** (2017). *Magnetic Field Probes for Time-Domain Monitoring of Radiofrequency Exposure within Tissue-Mimicking Materials for MRI-Compatible Medical Device Testing.* In Press: IEEE Electronics Letters, 17 October 2017. DOI: 10.1049/ei.2017.3568.

21. Araya, Y.T., Martinez-Santiesteban, F., Harris, C.T., Handler, W.B., **Chronik, B.A.**, & Scholl, T.J. (2017). *Nuclear Magnetic Relaxation Dispersion of Murine Tissue for Development of T1 (R1)-Dispersion Contrast Imaging.* In Press: NMR in Biomedicine, July 2017. DOI: 10.1002/nbm.3789.

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23. Harness, C., Lindsay, M., Brien, D., Stroman, P.W., Gati, J.S., MacKenzie, L.W., & **Chronik, B.A.** (2017). *Magnetic Resonance Imaging of Fresh Cadavers: Initial Experiences.* The FASEB Journal, 31(1 Supplement):903-3.

24. Attaran, A., Handler, W.B., Wawrzyn, K., **Menon, R.S.**, & **Chronik, B.A.** (2017). *Reliable RF B/E-Field Probes for Time-Domain Monitoring of EM Exposure during Medical Device Testing.* In Press: IEEE Transactions on Antennas and Propagation. DOI: 10.1109/TAP.2017.2723085.

25. Peel, T.R., Dash, S., **Lomber, S.G.**, & **Corneil, B.D.** (2017). *Frontal eye field inactivation diminishes superior colliculus activity, but delayed saccadic accumulation governs reaction time increases.* Journal of Neuroscience, 37: 11715-11730.

26. Camp, A.J., Gu, C., Cushing, S.L., Gordon, K.A., & **Corneil, B.D.** (2017). *Splenius capitis is a reliable target for measuring cervical vestibular evoked myogenic potentials in adults.* European Journal of Neuroscience, 45:1212-1223.

27. Monaco, S., Gallivan, J.P., Figley, T.D., Singhal, A., & **Culham, J.C.** (2017). *Recruitment of foveal retinotopic cortex during haptic exploration of shapes and actions in the dark.* Journal of Neuroscience, 37(48):11572-11591.

28. Freud, E., **Culham, J.C.**, Plaut, D. C., & Behrmann, M. (2017). *The large-scale organization of shape processing in the ventral and dorsal pathways.* eLife, 6, e27576.

29. Vesia, M., Barnett-Cowan, M., Elahi, B., Neva, J., Davare, M., Staines, W., **Culham, J.C.**, & Chen, R. (2017). *Human dorsomedial parieto-motor circuit specifies grasp during the planning of goal-directed hand actions*. Cortex, 92, 175-186.

30. Hahamy, A., Macdonald, S.N., van den Heiligenberg, F., Kieliba, P., Malach, R., Emir, U., Brugger, P., Johansen-Berg, H., **Culham, J.C.**, & Makin, T.R. (2017). *Representation of multiple body parts in missing hand territory of congenital one-handers.* Current Biology, 27, 1350-1355.

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All peer-reviewed publications listed above were submitted by BMI core members. Publications and other research details about the associate members can be found at: http://www.uwo.ca/bmi/members/associate_members.html.

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