New Grants for Pursuing Science Research in Mental Health at the Douglas Institute

Montreal, May 13 2010 – The following Douglas Mental Health University Institute research teams were recently awarded grants from the Natural Sciences and Engineering Research Council of Canada (NSERC) to pursue work in their respective fields of expertise.

BIRTH HORMONE SURGE AND BRAIN FUNCTIONS – Understanding the physiology of the birth process

Patricia Boksa, PhD, research scientist, and her students will use this $175,000 grant to better understand the role of epinephrine (Epi) in determining variations in brain function. Normal birth stimulates very large surges in levels of many hormones in the blood, but surprisingly we do not know the function of many of these hormonal surges. Patricia Boksa's long-term goal is to better understand the physiology of birth and in particular to understand how regulatory mechanisms protect the brain during birth. Her team will use animal models that mimic brief periods of birth hypoxia to test if Epi, which is released during normal birth and in response to more severe birth hypoxia, is able to protect the brain from hypoxic damage. They will also test if the presence or absence of circulating Epi at the time of birth can have long-term effects on brain function. These experiments may help describe how early events at the time of birth may contribute to subtle differences in brain function among individuals as adults.

EPISODIC MEMORY – A cognitive neuroscience approach to better understand schizophrenia

Martin Lepage, PhD, Director of the Brain Imaging Centre, and his team of students will use this 5-year $175,000 grant to pursue research on episodic memory using a cognitive neuroscience approach and to build on their previous work with functional Magnetic Resonance Imaging (fMRI). In the past few years, Martin Lepage and his students have been exploring multiple dimensions of the episodic memory system using a cognitive neuroscientific approach. Using fMRI, they will use memory tasks they developed in the past—namely emotional face memory, memory interference, and action memory—to develop electrophysiological indices of those processes. The goal is to build on previous studies in healthy participants and continue making advances in their research program on the cognitive neuropsychiatry of schizophrenia.

HOW THE BRAIN PERCEIVES AND PROCESSES STRESS - And how this could relate to mental illness

Jens Pruessner, PhD, Director of the Aging and Alzheimer's Research Axis, and his team will receive $175,000 over the next 5 years to investigate the association between structure and function of the central nervous system and stress perception and processing by using new neuroimaging techniques. It is well known that systemic changes in hormonal and metabolic levels as a result of stress are linked to specific disease states, such as depression). What is much less clear, however, are the exact mechanisms involved, i.e., how stress is perceived and processed in the brain and how these neural changes govern metabolic changes and ultimately the development of disease. This team has made significant progress over the last five years to identify possible structures, networks, and activation patterns linked to adverse health effects as a consequence of stress. Jens Pruessner's current goal is to make significant advances in the methods used to investigate the effects of acute stress in the central nervous system.

HOW WE MAKE SENSE OF NEW INFORMATION - To further knowledge about schizophrenia

Jacques Bruno Debruille, **MD, PhD, research scientist,** will use $135,000 over 5 years to identify the mechanisms by which we understand the meaning of stimuli, such as words in their contexts. The component of brain electrical activity that indexes these mechanisms is called the N400 potential. It is known to be abnormal in schizophrenia, but we do not yet know what this anomaly means. Jacques Bruno Debruille will continue to gather cumulative data on how the N400 potential plays a role in abnormal brain cognition.

NEW STATE-OF-THE-ART EQUIPMENT – to study complex cell populations

Nicholas Cermakian, **PhD, research scientist**, and five other investigators from the Douglas will use $142,000 this year to purchase an on-site flow cytometer to study brain processes and neuro-immune interactions. Flow cytometry is a primary method for performing a variety of measurements in heterogeneous cell populations and complex samples to identify characteristics and identity at the single-cell level. Research aimed at deciphering brain function, and cross-talk between the brain and other physiological systems, is critical for understanding mental and neurological disorders. The research performed using the flow cytometer will lead to a better understanding of how the brain works, including biological timing, learning and memory, brain development, and mechanisms of psychiatric disorders.

HOW WE LEARN AND MAKE NEW MEMORIES – Understanding the role of a new type of neurone

Sylvain Williams, PhD, research scientist, and his team will receive $135,000 to pursue their work in understanding the role of a new type of neuron they had found in 2003 in a region called the medial septum which is a nuclei critical for learning and memory. Before theirfindings it was generally acknowledge that the medial septum contained only cells utilizing the neurotransmitters acetylcholine and GABA. When they revisited this paradigm they found that 25% of the neuronal population actually released glutamate, the most prominent excitatory transmitter in the brain. The goal of this grant is to understand how these glutamate neurons contribute to the activity of the hippocampus which is the brain region where new memories are made and stored for short amount of time.

STATISTICAL TOOLS – to help define the phenotype in genetic studies

Aurélie Labbe, PhD, will receive $60,000 over 5 years to develop a set of statistical tools to help defining the phenotype in genetic studies. Typically, a large number of items (phenotypes) are measured on each subject in such studies. The methods developed will help identifying a summary measure allowing a better characterization of the underlying disease in order to identify the genes associated with the disorder studied. The applications of her research are in schizophrenia, ADHD and autism.

Information

Marie france Coutu,
Media Relations, Douglas Institute
Phone: 514-761-6131, ext. 2769. Cell: 514-835-3236
marie-france.coutu@douglas.mcgill.ca www.douglas.qc.ca

About the Douglas – www.douglas.qc.ca
The Douglas is a world-class institute affiliated with McGill University and the World Health Organization. Its mission is to treat people suffering from mental illness and offer them both hope and healing. The Institute's teams of specialists and researchers continually advance scientific knowledge, integrate it into patient care, and share it with the community to increase awareness and thus eliminate stigma around mental illness.