University of Lethbridge

NEWS RELEASE

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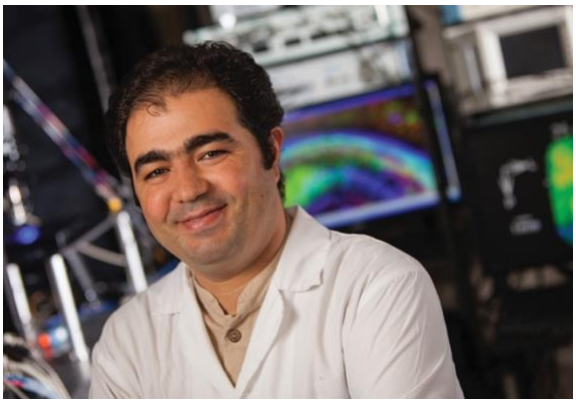
Grant to aid in developing new treatments for Alzheimer's disease

The University of Lethbridge's Dr. Majid Mohajerani and two partners from Laval University are creating new tools for neuroscience research that they'll use to test out a promising drug target for Alzheimer's disease. If successful, their research could lead to new treatments to prevent the onset of Alzheimer's disease symptoms, delay progression of the disease or even restore normal function after symptoms have appeared.

The research is made possible thanks to a grant of nearly $1 million over three years from the Weston Brain Institute, a non-profit institute of the W. Garfield Weston Foundation that supports world-class neuroscience research to accelerate discovery of treatments for neurodegenerative diseases such as Alzheimer's and Parkinson's.



"New treatments for these diseases are critically needed," says Mohajerani, a professor of neuroscience at the U of L's Canadian Centre for Behavioural Neuroscience (CCBN). "Alzheimer's disease has an enormous impact on patients, the health-care system and society. This is only anticipated to get worse as the population ages. Current treatments for Alzheimer's disease only address some of the symptoms. They do not prevent or alter the course of the disease."

In the project, Mohajerani, along with Laval University's Drs. Benoit Gosselin and Yves De Koninck, will develop a device that allows for minimally invasive stimulation and recording of brain activity in mice in their home cages. The device includes a wireless transmitter, thus removing the need for the animal to be taken from its home cage and hooked up to wires in the lab. This implant will be combined with an automated monitoring system, currently under development at the CCBN, that records the animals' natural behaviour. Together, these devices will allow scientists to measure both the brain activity and behaviour of an animal in its home environment over days, weeks or even months.

The technology will enable them to address the idea that abnormal brain activity, characterized by an imbalance between excitatory and inhibitory connections in the brain, underlies the early progression of Alzheimer's disease. De Koninck is a world expert on a certain protein, found on the outer membranes of cells within the nervous system, called potassium chloride co-transporter 2 (KCC2). An increase or decrease in the production of KCC2 affects the balance of inhibitory and excitatory activity in the brain. Pharmaceutical tools that target KCC2 might thus be able to correct the imbalance observed in Alzheimer's disease, as well as other nervous system disorders such as chronic pain.

"We are using drugs that modulate the expression of KCC2," says Mohajerani. "We will increase and also decrease the production of KCC2 to study both effects. We will explore if activation of KCC2, by boosting neuronal inhibition, can reduce the progression of the disease and if inhibition of KCC2 will increase the progression of the disease."

Using genetically modified mice that model Alzheimer's disease pathology and symptoms, the project aims to accelerate the development of therapeutics for Alzheimer's disease by testing how altering KCC2 function affects brain activity and behaviour during disease progression in living animals. If successful, this research would implicate KCC2 as an entirely new drug target for mitigating Alzheimer's disease.

This grant is the first for the U of L from the Weston Brain Institute.

This news release can be found online at Weston Brain Institute grant.

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