



Funding Research | Fueling Hope

2018 Donors'

RESEARCH REPORT

We are proud to inform you that four major research projects, now underway at leading Canadian universities are fueling hope for those living with epilepsy. All received significant funding from Epilepsy Canada earlier this year-made possible by your generous gifts.

The projects –at The Krembil Research Institute, McGill University, University of Montreal CR CHUM and CHU Sainte-Justine Research Centre - are exploring a range of innovative solutions that promise to improve the quality of life for patients who battle the ever-present threat of seizures.

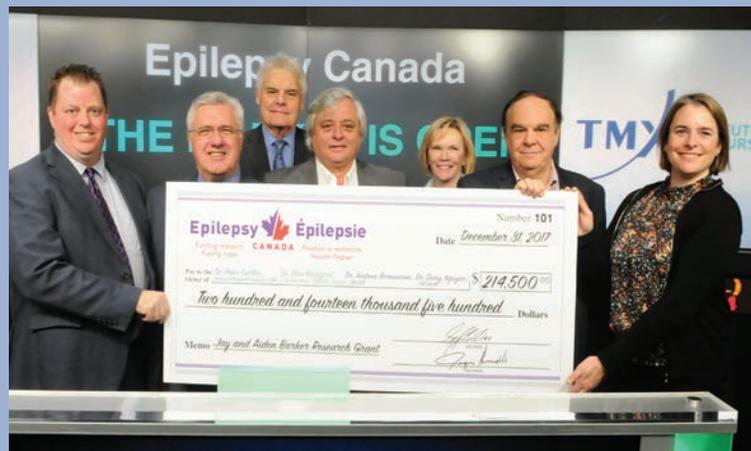
Your brain under the microscope: the ultimate personalized medicine for epilepsy

Dr. Peter Carlen at the Krembil Research Institute is pushing the boundaries of personalized medicine for patients with intractable (medication resistant) epilepsy. Using stem cells from tissue obtained from affected patients his goal is to create “cerebral organoids” that would be used to rapidly screen for effective treatments. Once identified, this could be translated back to the patient to treat or cure their seizures.

Dr. Carlen has assembled a first-rate team to work on the project and he expects, “We will start characterizing cerebral tissue derived from intractable epilepsy patients and age and sex matched controls, probably by early next year.”

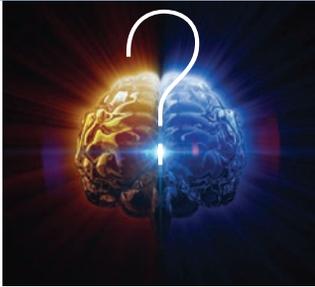


Epilepsy Canada awarded the Jay & Aiden Barker Breakthrough Grants in Clinical and Basic Sciences during a ceremony held at the TSX, in January 2018.



Accepting the grants from representatives of the Board of Directors, on behalf of all the recipients are Dr. Elsa Rossignol CHU Sainte- Justine and Dr. Peter Carlen of the University of Toronto and Krembil Research Institute

Two Projects Focus on Improved Seizure Forecasting & Fighting SUDEP



Despite advances in epilepsy research, 30 to 40% of affected individuals will continue to have seizures; that is, they have medically-intractable epilepsy (also called refractory epilepsy). These individuals are at higher risk of having cognitive/behavioral difficulties, seizure related injuries and sudden death (SUDEP).

Two of the four projects that received Epilepsy Canada funding are focused on improving the lives of these patients.

Dr. Andrea Bernasconi, Montreal Neurological Institute (MNI), McGill University aims to use advanced imaging techniques to predict medically intractable epilepsy at the time of diagnosis. The potential impact includes identifying novel insights into neurobiological substrates of drug-resistant epilepsy, early surgery referral in high risk patients, and with the linkage of imaging to profiles of drug response there is potential to guide customized first line antiepileptic treatment.

This project clearly aligns with Epilepsy Canada's mission to pursue a cure. A member of the Scientific Review Committee commented, "This is an exciting proposal from a researcher with a long track record of epilepsy imaging, experience in all the techniques proposed, and this work has the potential to allow us to identify refractory patients more quickly, to accelerate access to a cure from surgery and to guide antiepileptic drug choice."

MNI expects this work will take up to four years to complete. Progress is already being reported, "We have been able to identify previously unrecognized, lesional sub-classes in focal cortical dysplasia (a common cause of intractable epilepsy in children) that could modulate drug response in patients."



Improved Management of refractory epilepsy is also the goal of research at CR-CHUM, University of Montreal. **Dr. Dang Nguyen** is working to develop a functional seizure forecast system that has potential for almost immediate patient impact. In his study, he aims to develop an optimized seizure forecasting algorithm that can be implemented into hardware and feedback circuits. The latter would include developing simple devices, such as automated triggered alarms, which can be implemented on a short-term basis, with the potential of having major patient benefits (reduction of seizure-related injuries, morbidities and deaths from SUDEP).



Hope for a revolutionary approach in the treatment of newly diagnosed epilepsies in children.

A grant was also awarded to **Dr. Elsa Rossignol**, an assistant professor at the University of Montreal working with CHU Sainte-Justine Research Centre.

Dr. Rossignol's goal is to identify genes that are responsible for brain malformations that result in epilepsy. She will gather this information from across Canada and use it to look for commonalities that will permit targeted and personalized treatment strategies in newly diagnosed childhood epilepsies. This will empower physicians to choose the best medications for treatment.

This information will also be used to generate novel mouse models of epilepsy that provide new information on how genetic mutations affect brain function when the functional impact of a mutation is not known. This research is expected to extend for two years, but early findings have already been shared at several regional and one international gathering of life science professionals.



Epilepsy Canada is a registered Canadian charity dedicated to positively affecting the lives of those living with epilepsy. Through its active financial support of epilepsy research, it strives to help the Canadian neurology community find a cure for epilepsy. It also undertakes education and awareness activities to build understanding, acceptance and hope for those affected by epileptic seizures or SUDEP (Sudden Unexplained Death in Epilepsy).