



Another project brought to you by **GenomeCanada**

High Throughput Mutation Screening of Ion Channel Genes in Familial Neurological Disorders

Status	Past
Competition	Competition II
Sector	Health
Genome Centre	Genome Quebec
Project Leaders	Guy Rouleau

Project Description

Our project brought together a network of Canadian clinical collaborators, genetics researchers and industrial partners to identify novel drug targets against neurological disorders that carry a significant social and economic burden, such as migraine, Tourette syndrome, epilepsy and bipolar disorder.

We tested for mutations in ion channel genes expressed in the brain. Ion channels regulate the flow of ions, an atom or a group of atoms with an electric charge, across the membrane in all cells. We prioritized our attention on variations that were likely to induce a detrimental change of function in the channel.

We were able to identify several very promising candidate genes for each of the given diseases. The most promising targets are being advanced into drug screening assays for the development of novel drugs able to treat the disorders.

For example, if successful, this drug development program will lead to first-in-class drugs for the prophylactic management of migraine, a disorder that affects a staggering 12% of the worldwide population and causes severe lost productivity. In the US alone, the market for anti-migraine drugs is about US\$1.8B.

Discovery of the genetic risk factors for migraine, Tourette, OCD, ADHD and epilepsy will also lead to molecular diagnostic tests that can be used to identify those individuals at risk of developing the disorder.

To our knowledge, this is the only candidate ion channel gene screening effort of this scale in the world. Our co-funder, Emerillon Therapeutics Inc., will continue to develop these novel candidate drug targets to create small compound therapeutics for the market. This will help establish Canada as a leader in the development of novel therapeutics for these diseases now and in the years to come.

Fast Facts

Highlighted outcome: discovery of several very promising candidate genes for several neurological diseases, including migraine, Tourette, and epilepsy; targets are being advanced into drug screening assays for the development of therapeutics to treat the disorders

Number of research personnel employed by the project: 10

Number of patents in process or obtained: 6 provisional patent applications – for migraine and Tourette syndrome candidate genes; 1 for candidate epilepsy genes

Co-funders: Emerillon Therapeutics Inc. (formed by parent company Xenon Genetics Research Inc.), Natural Science and Engineering Research Council of Canada