New technology is key to better epilepsy treatment

March 22 2013

(Medical Xpress)—University of Adelaide scientists are making a major impact on the understanding and diagnosis of epilepsy, which will lead to individualised treatments for sufferers.

Speaking in the lead up to Purple Day for Epilepsy Awareness (Tuesday 26 March), geneticist Professor Jozef Gecz says advances in DNA sequencing have been a huge leap forward in understanding epilepsy.

This, combined with the use of stem cells in laboratory research, will lead to further advances in epilepsy treatment, he says.

However, he cautions that the same technology has also helped to reveal that epilepsy is a far more complex condition than previously thought.

"Scientists used to believe that epilepsy was just one condition, possibly with one main cause. But now we know it is a very complex series of neurological disorders – it is many epilepsies, instead of just one epilepsy, with multiple causes and various symptoms," says Professor Gecz, from the University of Adelaide's School of Paediatrics and Reproductive Health.

Epilepsy is common, with up to 3% of the Australian population experiencing epilepsy at some stage in their lives. Genetic and environmental factors, and trauma, can all play a role in the development of epilepsy. Most (but not all) forms cause sufferers to experience seizures, which vary in severity.

Research in Adelaide has played an important role in the understanding of epilepsy in recent years.

"It's really thanks to the pioneering work of Dr John Mulley (Women's and Children's Hospital and University of Adelaide), who discovered the first gene for idiopathic epilepsy almost 20 years ago. Since then, almost 40 idiopathic epilepsy genes have been discovered, many of them by researchers here in Adelaide," Professor Gecz says.

"There are more than 300 genes known today in which DNA mutations can give rise to some form of epilepsy, in addition to other problems like intellectual disability, autism or psychiatric problems.

"Thanks to genetic sequencing technology, in most cases we are now able to solve the mystery about what kind of epilepsy a patient has, and we can do this very quickly, very accurately, and cost effectively.

"Molecular diagnosis is making a huge impact on treatment – it's really taken off in the last few years, and it has the potential to be even more effectively used in the future. Clinicians can now be guided by genetic information when considering treatment of patients with specific epilepsies."

Professor Gecz and colleagues are currently involved in a major national study of epilepsy, with his lab focusing on the "genetic architecture" of the condition.

Provided by University of Adelaide