

Neurochip technology developed by Canadian team

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The University of Calgary, Faculty of Medicine scientists who proved it is possible to cultivate a network of brain cells that reconnect on a silicon chip - or the brain on a microchip - have been involved in the development of new technology that monitors brain cell activity at a resolution never achieved before.

Developed with the National Research Council Canada (NRC), the new silicon chips are also simpler to use, which will help future understanding of how [brain cells](#) work under normal conditions and permit drug discoveries for a variety of neurodegenerative diseases such as Alzheimer's and Parkinson's.

The new technology from the lab of Naweed Syed, PhD, in collaboration with the NRC, is published online this month in the journal, *Biomedical Microdevices*.

"This technical breakthrough means we can track subtle changes in brain activity at the level of ion channels and synaptic potentials, which are also the most suitable target sites for drug development in neurodegenerative diseases and neuropsychological disorders," says Syed, professor and head of the Department of Cell Biology and Anatomy, member of the Hotchkiss Brain Institute and advisor to the Vice President Research on [Biomedical Engineering](#) Initiative of the University of Calgary.

The new neurochips are also automated. Previously it took years of

training to learn how to record ion channel activity from brain cells, and it was only possible to monitor one or two cells simultaneously. Now, larger networks of cells can be placed on a chip and observed in minute detail, allowing the analysis of several brain cells networking and performing automatic, large-scale drug screening for various brain dysfunctions.

"The success of this project was achieved by reaching across the boundaries of scientific disciplines," said Dr. Roman Szumski, NRC Vice President, Life Sciences. "This is a true partnership of neuroscientists, engineers and physicists from different Canadian R&D institutions. We are committed both to understanding the ultimate mystery of the brain and to developing tools and systems to accelerate development of better diagnostics and therapeutics for brain diseases."

This new technology has the potential to help scientists in a variety of fields and on a variety of research projects. Gerald Zamponi, PhD, professor and head of the Department of Physiology and Pharmacology, and member of the Hotchkiss Brain Institute at the University of Calgary, says, "This [technology](#) can likely be scaled up such that it will become a novel tool for medium throughput drug screening, in addition to its usefulness for basic biomedical research".

Provided by University of Calgary

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