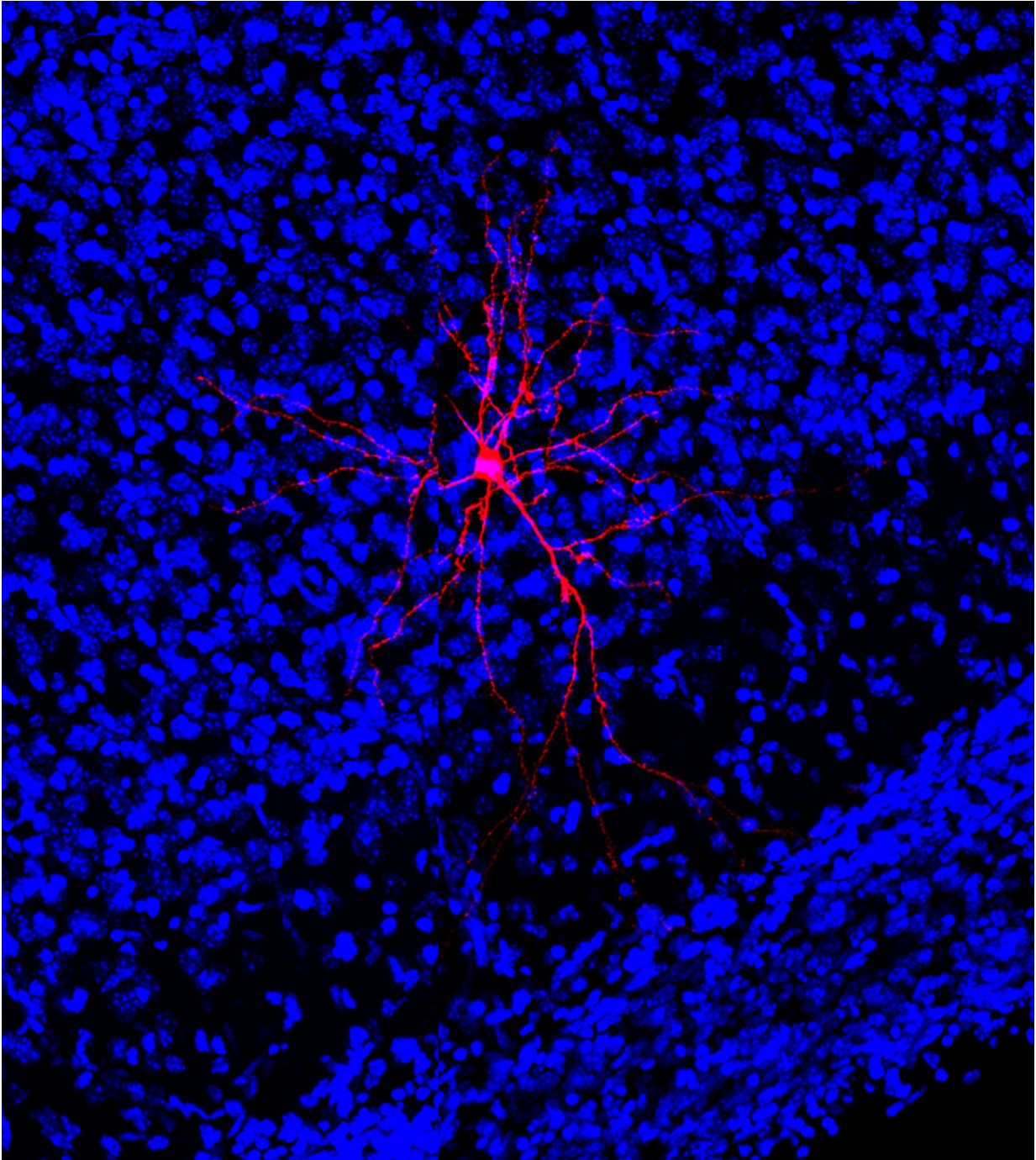


New robotic technology may provide more insight into neurological diseases, which affect about one-third of Americans

August 16 2018, by Chris Adam



This image shows a neuron patched with the automated image-guided patch clamp system in the brain slice. Purdue University researchers developed a robotic system that provides an advanced way to study the brain and how the individual neurons inside function. Credit: Purdue University

Purdue University researchers are a step closer to answering one of the critical questions about the brain – how neural networks in the organ perform the computations necessary for higher-level brain functions.

The technology also provides a new tool for the potential development of medications for [neurological diseases](#) such as Alzheimer's, multiple sclerosis and epilepsy.

The Purdue researchers developed a [robotic system](#) that provides an advanced way to study the brain and how the individual [neurons](#) inside function. The Purdue software automates most of the work involved in the patch-clamp technique, a widely used process involving the attachment of a glass pipette to a cell membrane to record electrical activity from [individual neurons](#).

The system provides an advanced method for scientists to identify, target and record neuron activity in the brain.

"Our technology has far-reaching implications," said Alexander Chubykin, an assistant professor of biological sciences at Purdue, who led the research team. "Our technology opens up new doors to study the brain and the impact of [new drugs](#) on patients who suffer from neurological diseases."

The Purdue team developed an algorithm to drive the system without a person controlling the movement.

"The traditional patch-clamp method is done manually and requires lots of time and training," Chubykin said. "Our process uses computer vision with automatic image guidance to make the whole technique faster, easier and require less training. This is an incredible step forward."

Purdue's software technology also provides 3-D coordinates of cells in

the brain sample, which scientists can use to precisely locate the individual cells and then target them with new drugs. The Purdue technology allows this examination without extracting the cells, which is a requirement for current drug screening methods.

"A truly great component of our innovation is the ability to study the neurons in an environment that much more closely resembles the natural one than has traditionally been used for drug screening" Chubykin said.

Provided by Purdue University

Citation: New robotic technology may provide more insight into neurological diseases, which affect about one-third of Americans (2018, August 16) retrieved 18 April 2024 from <https://medicalxpress.com/news/2018-08-robotic-technology-insight-neurological-diseases.html>

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