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Robotic arm to reveal inner working of brain cells

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Washington, May 7 — Gaining access to the inner workings of a brain cell (neuron) in real time offers a wealth of useful information. However, it is such a painstaking and challenging task that only a small number of labs in the world practise it - until now.

Researchers have developed a new automated process to find and record information from neurons such as patterns of electrical activity, its shape, even a profile of which genes are turned on at a given moment, thus eliminating the need for months of training and providing long-sought information about living cells' activities, the journal Nature Methods reports.

The method could be particularly useful in studying brain disorders such as schizophrenia, Parkinson's disease, autism and epilepsy.

Ed Boyden, associate professor of biological engineering and brain and cognitive sciences at the Massachusetts Institute of Technology (MIT), US, collaborated with Craig Forest, assistant professor of mechanical engineering at the Georgia Institute of Technology, US, on the project.

"In all these cases, a molecular description of a cell that is integrated with [its] electrical and circuit properties has remained elusive. If we could really describe how diseases change molecules in specific cells within the living brain, it might enable better drug targets to be found," adds Boyden.

Boyden and Forest designed a robotic arm which, guided by a cell-detecting computer algorithm, identifies and records from neurons in the living mouse brain with better accuracy and speed than a human experimenter, according to an MIT and Georgia statement.

"Our team has been interdisciplinary from the beginning, and this has enabled us to bring the principles of precision machine design to bear upon the study of the living brain," Forest says.

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