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NEUROSCIENCE

Robots could soon be probing your brain

To figure out how your brain works, researchers need to be able to measure the electrical activity of neurons. But now, a new method allows robots to perform the task instead.

Your brain and nervous systems are made up of **neurons**, sending and receiving the electrical signals that let us breathe, move, think, remember, and generally function. So knowing how individual neurons work, their patterns of electrical activity, and which of their genes are activated at any given time also will also give us insight into how the brain functions as a whole.

But how exactly do you crack open a neuron to analyze its activity? The current method of

BY SOPHIE	BUSHWICK	
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electrophysiology. In this method, you touch



rc pipene vetweell membrane could, 8:45 PM as in the illustration. ual neuron. Gently, suck a tiny section, or "patch," of

membrane into the tip of the pipette without



e & MRESSAP, you can stu8y04hePM in that parts cutal paten of Nick's surprising past



even more ambittous. The next Suit of meat armor offers +5 ply stronger suction displacing your patch and leaving the pipette tip sealed

e Mittherevelle Eller Bough the Booten M elPhaesubranse, old off mehesteaby record the entire neuron's activity. attractive

As you might imagine, patch-clamp is a fussy and difficult technique that requires months of training, limiting its practice to few laboratories. But what if you could automate the process? Instead of training humans to perform patch-clamp, labs could just order a robot programmed to do the job.

Researchers at MIT and the Georgia Institute of Technology have delegated whole-cell patch-clamp electrophysiology to a robot arm equipped with a cell-detection algorithm. The arm lowers the patch-clamp pipette into the brain of an unconscious

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mouse while measuring how easy it is for IN electricity to move out of the pipette. With po

LATEST STORIESMONDAY, MAY 21, 201: when the pipette runs up near a neuron, the flor Under the guidance of an algorithm, the pipette measuring the electrical impedance ten times er impedance shoots up, indicating the presence o perform the patch-clamp procedure on it.

So far, the automated robot arm is great at dete time, but it's not as good at performing the patc about 40 percent of the time. Still, considering the the robot arm is pretty good at this technique, a

Based on their results, the researchers suggest t

automated: **CULT MOVIE WOR...** vettøppedint væbet tilgat autor at Rally edatsimstei NtAS Aortos conthips 3 car applications of robotics to the automation of in vivo assavs in biogngingering and medicine, wil es*Gand*,topinstall,them_automatical ingu**hprisingspar**tvention. The use of monitoring could enable a single human operat hroughput. 4:00 PM Suit of meat armor offers +5 ne naving protoction against vegetarians would possibly more precise than human operators, I MONKEY NEWS 3:30 PM True, humans can make devastating of appropriate brest prentorse kingeny h attractive Via Nature Methods

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y second and stopping as soon as the cell. Once it senses the cell, the robot arm can

ng the cells, finding neurons 90 percent of the clamp technique, only creating the connection t humans can't get it right all the time either, it doesn't require a lengthy training process.

t even more neuroscience could become

forms patch clamping in vivo and us of live mice. We anticipate that other o neuroscience experiments, and to other in $\frac{1}{2}$ possible. The ability to automatically make might eliminate some of the few remaining tomated respiratory and temperature to control many rigs at once, further

certainly be convenient, time-saving, and 'e to ask: Would you trust a bot with your own istakes without machine intervention, but the l open still makes me a wee bit nervous.

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