NEWS

New tool takes rapid genetic snapshot of people's neurons

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A new approach quickly captures an individual's gene expression pattern at the level of a single neuron. Researchers presented the unpublished method yesterday at the **2016 Society for Neuroscience annual meeting** in San Diego.

The tool marries two existing techniques: a method of sampling cells from the human nasal cavity, known as nasal brush biopsy; and gene expression analysis of single cells.

The method offers an enormous advantage because gene expression is thought to shift over the days, weeks and months it might take for cells from human biopsies to be cultured and analyzed.

The new tool drastically shortens the time between sampling and analysis. Because of its rapidity, it could be used to capture the fleeting expression of genes activated or switched off under only certain conditions, such as stress.

Researchers collect the cells by inserting gentle brush deep into an individual's nose until it touches the olfactory bulb. (The olfactory bulb is a structure at the top of the nasal cavity that mediates the sense of smell.) As much as 70 percent of cells sampled from this region are neurons, the researchers say. The process takes about three minutes and is less invasive than blood draws or skin biopsies.

Researchers then load the sample into a machine that separates individual cells into the wells of a lab dish. They can then analyze the cells using established methods of assessing DNA or RNA expression, such as the polymerase chain reaction or RNA-Seq.

The researchers tested the method in five people with bipolar disorder and five typical controls. They extracted 565 cells from each individual and analyzed their gene expression.

The analysis revealed that neurons from the people with bipolar disorder express abnormally low levels of a gene called NEUROD1, which has been linked to the condition. Other types of cells present in the biopsy material do not show any alterations in NEUROD1 levels.

The researchers say they did not see these changes when they grew the cells in culture for several weeks and then analyzed their gene expression. The finding suggests that expression patterns change as neurons are cultured in the lab.

For more reports from the 2016 Society for Neuroscience annual meeting, please ***click here****.*