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Genetic Engineering and Light Team Up to Control Neuron Activity

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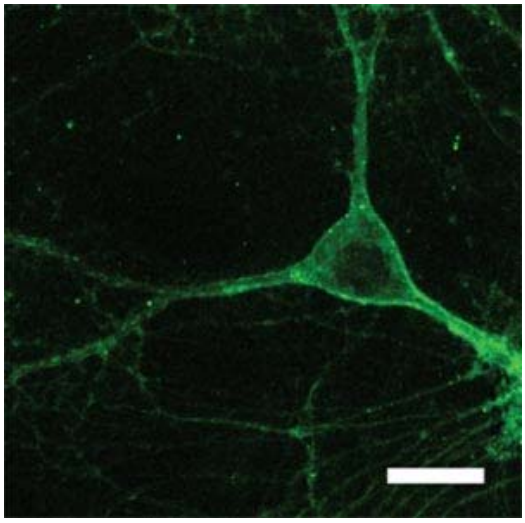

Scientists at MIT have discovered a method to shutdown specific neurons with different colors of light. The scientists isolated two genes from bacteria and fungi that are light-sensitive. They then used a virus to insert these genes into neurons. When these genetically engineered neurons were exposed to light, the light-activated proteins lowered the neurons' voltage, preventing them from activating. One of the genes responds to yellow light, and the other responds to blue.

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Current methods to directly control neuronal activity rely on over-stimulating neurons (e.g: DBS), rather than inhibiting their activity. While similar methods of light-sensitive gene delivery have been used in the past, this new method allows specific control with different colors of light.

Here's more from the press release:

> "Silencing different sets of neurons with different colors of light allows us to understand how they work together to implement brain functions," explains Ed Boyden, senior author of the study, to be published in the Jan. 7 issue of Nature. "Using these new tools, we can look at two neural pathways and study how they compute together. These tools will help us understand how to control neural circuits, leading to new understandings and treatments for brain disorders — some of the biggest unmet medical needs in the world." Boyden is the Benesse Career Development Professor in the MIT Media Lab and an associate member of the McGovern Institute for Brain Research at MIT.

Read more from MIT: Neuroengineers silence brain cells with multiple colors of

light

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