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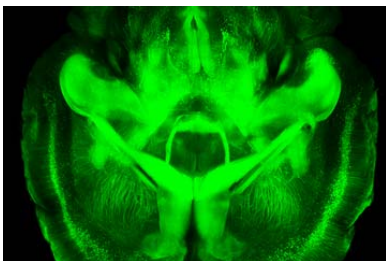
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Unlocking the Secrets of the Brain (Gallery)

by Live Science Staff | March 26, 2015 07:27pm ET

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The U.S. National Science Foundation (NSF) contributed these images to Live Science's [Expert Voices: Op-Ed & Insights](#).

Researchers are on the verge of revealing the brain's deepest secrets, teasing out how the mind emerges from clusters of neurons and chemistry. The images below highlight some of the latest breakthroughs in brain science, and for more on what scientists expect from the future of brain research, read the related essay "[Unlocking the Brain, Earth's Most Complex Biological Structure](#)" by neuroscientist, and NSF Directorate for Biological Sciences head, James Olds.

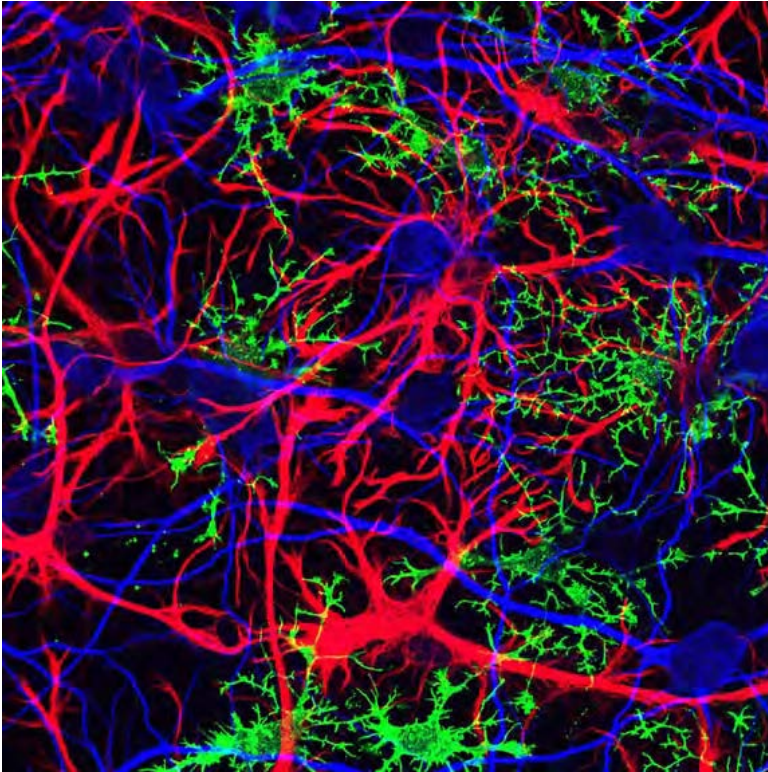
Rainbow-colors

An intact mouse [brain](#) imaged via a new technique called CLARITY, which reveals fine details and the big picture at the same time.



Credit: Kwanghun Chung and Karl Deisseroth, Howard Hughes Medical Institute/Stanford [University](#)

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Glial cells that appear red and green are the most abundant cells in the human brain. Cells that appear in blue help insulate nerve cell axons in the brain. Neurons appear blue. (Credit: Jonathan Cohen/NIH.)

A first



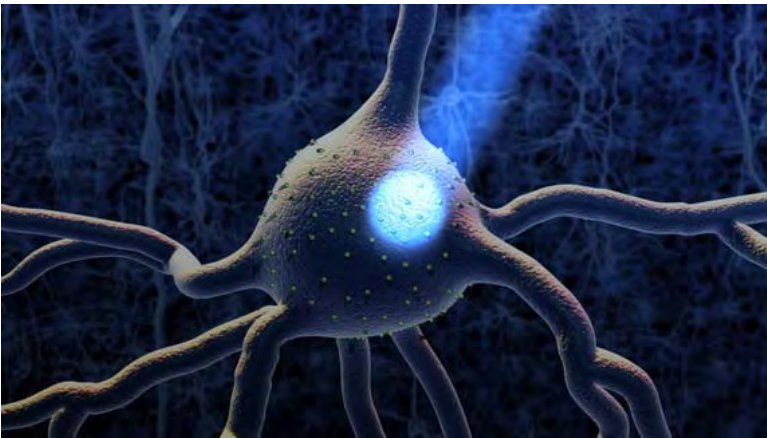
A blind man sees New York City's [Christmas](#) lights for the first time after receiving an implant of the [Argus II Retinal Prosthesis System](#), or "bionic eye." The development of this prosthesis built on studies of the ways visual information may reach the brain when parts of the eye are damaged. (Credit: Laura Wyant, Pascale Communications.)

Off-switch



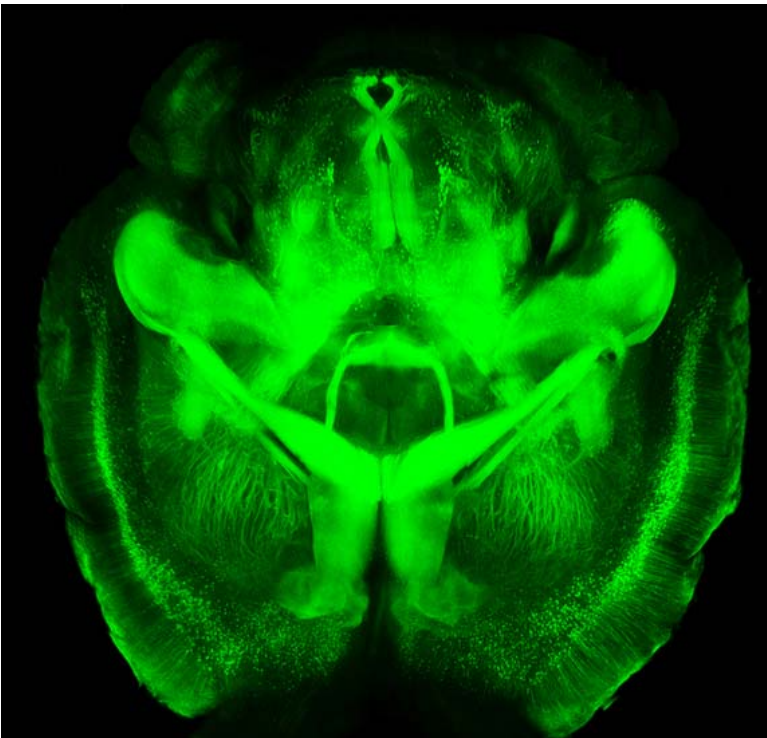
Orange light turns neurons off through a technique called optogenetics. (Credit: Ed Boyden and McGovern Institute for Brain Research at MIT.)

Light-activated



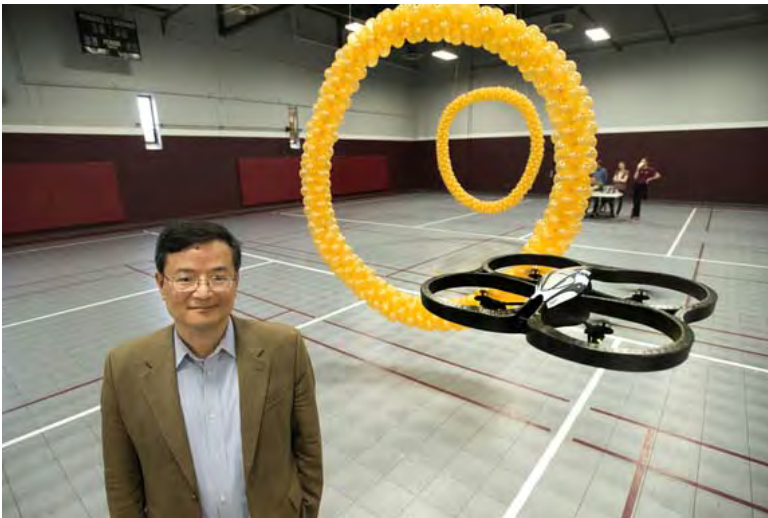
A neuron is turned on by light via a technique called optogenetics. (Credit: Ed Boyden and MIT McGovern Institute)

Big picture and details, too



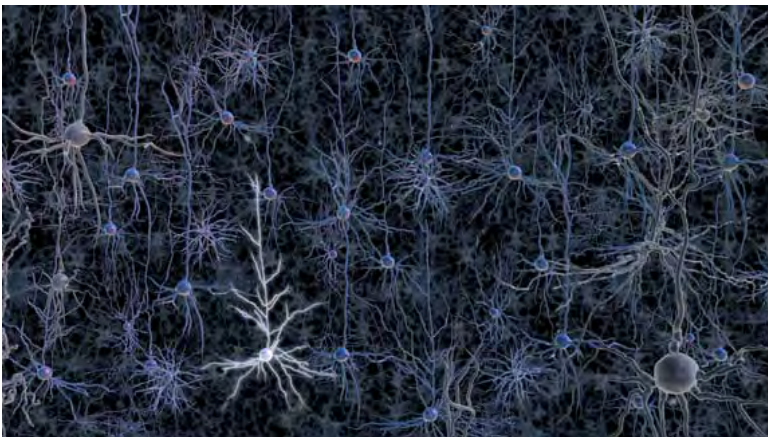
An intact mouse brain imaged via a new technique called CLARITY, which reveals fine details and the big picture at the same time. (Credit: Kwanghun Chung and Karl Deisseroth, Howard Hughes Medical Institute/Stanford University.)

Mind-controlled



Researchers control a flying robot using only their minds. (Credit: University of Minnesota.)

You are activated



An activated neuron in a tangle of neurons. (Credit: Ed Boyden and McGovern Institute for Brain Research at MIT.)

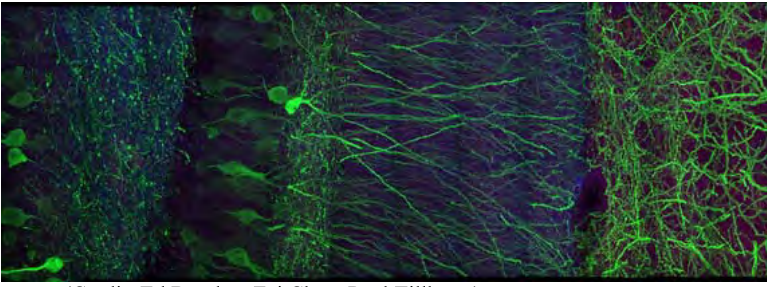
Robot-aides



The design of [an exoskeleton \(external skeleton\) that will allow paraplegics to walk again](#) drew on basic neuroscience research. The exoskeleton uses [computer](#) algorithms to interpret the user's brain activity, which powers the exoskeleton forward. (Credit: Walk Again Project/virtualreality.duke.edu.)

Picture-perfect

Part of a mouse brain shown with a new imaging technique that physically enlarges cells and then magnifies them, rather than just magnifying them; neurons are



green. (Credit: Ed Boyden, Fei Chen, Paul Tillberg.)

Selective power-ups



Only one type of brain cell — a basket cell — is selectively turned on by light via a technique called optogenetics. (Credit: Ed Boyden and McGovern Institute for Brain Research at MIT.)

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