



JPNN|Scientists have found a “reset button” for our biological clock, paving the way for more effective treatment of jet lag, the negative health effects of shift work and seasonal affective disorder (SAD). The discovery was made by a group of researchers at the Vanderbilt University and published in the journal *Nature Neuroscience* on February 2. During the research, the group discovered they could artificially stimulate the brains of mice and change their natural waking and sleeping cycles, without using the presence of light. They carried this out with the stimulation or suppression of neurons in the brain's suprachiasmatic nucleus (SCN), which can effectively reset the biological clock. The SCN is a small region inside the hypothalamus which regulates a 24-hours rest and activity cycle and helps animals know when they should eat or rest. According to neuroscientists, mice have a biological clock which is almost identical to that of humans with the difference that it is fine-tuned for nocturnal life. To carry out the project, researchers used two strains of genetically engineered mice. One strain had an optically sensitive protein which triggered neuronal activity after exposure to light, and the other had a protein which suppressed neuronal activity after exposure to light. Both strains of mice's biological clocks neurons were stimulated with the use of laser and an optical fiber, with a method called optogenetics. Optogenetics permits researchers to suppress or stimulate neurons with a beam of light. Initially light-sensitive genes are introduced into the neurons so they “turn on” when stimulated with the laser. By assessing the neurons response to the light, the scientists were able to measure and control the rate at which neurons fired in the SCN.

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