

Researchers devise a way to alter feelings attached to memories in mice while they sleep

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Credit: Martha Sexton/public domain

(Medical Xpress)—A team of researchers in France has found a way to alter how a mouse "feels" about something it has remembered. In their paper published in the journal *Nature Neuroscience*, the team describes how they recorded brain activity while mice visited new areas of their cage, then stimulated their brains while they slept in a way that made them favor the place they had visited and remembered.

Altering memories has always been the stuff of science fiction, but now it appears that there might be a way to cause someone to change how they feel about something by stimulating their brain while they sleep—if the findings by the team in France apply to [human brains](#).

To find out if they could change how a mouse "felt" about something it remembered, the researchers hooked up several of the rodents to brain scanners and then recorded brain activity as they scouted

out their new cages. In particular, the researchers were keen on noting when certain cells, known as "place" cells (neurons that prior research has shown are involved in storing memories) fired in response to something that the mouse was seeing—in this case, a certain part of its cage. Other research has shown that certain dreams entail reviewing recent experiences, causing the same [place cells](#) to become active again. Thus, later, after the [mice](#) were sleeping, the researchers monitored [brain activity](#) again, watching for when that same place cell that had become active earlier, became active again. When it did, the researchers sent a signal to a part of the mouse's brain associated with a reward. Upon awakening, the mice all went straight to the part of the cage that had been caused to be associated with a reward.

The researchers note that their experiments did not result in new memories being created, instead, they had changed the way that the mice responded to something they were remembering anyway. The team also noted that it was not clear if the same sort of experiment would work with people, but if so, it might be possible to use it to help people with PTSD. The researchers also do not know if their technique could be used to cause changes to associations with more complicated tasks, such as all the parts of an event, or when learning something new.

More information: Explicit memory creation during sleep demonstrates a causal role of place cells in navigation, *Nature Neuroscience* (2015) [DOI: 10.1038/nn.3970](https://doi.org/10.1038/nn.3970)

Abstract

Hippocampal place cells assemblies are believed to support the cognitive map, and their reactivations during sleep are thought to be involved in spatial memory consolidation. By triggering intracranial

rewarding stimulations by place cell spikes during sleep, we induced an explicit memory trace, leading to a goal-directed behavior toward the place field. This demonstrates that place cells' activity during sleep still conveys relevant spatial information and that this activity is functionally significant for navigation.

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