False memories implanted in mouse's brain during sleep

Mice can recall artificial memories created during sleep once they're awake, researchers from the French National Center for Scientific Research (CNRS) and their colleagues reported in *Nature Neuroscience*. The findings support a causal role between the firing of specialized neurons called place cells and the ability of these neurons to represent a particular location in space. Place cells, part of the brain's "inner GPS," were first discovered by John O'Keefe, who last year shared the Nobel Prize in Physiology or Medicine.

"This was a fantastic, well-thought-out idea that, miraculously, worked," said neuroscientist György Buzsáki of the New York University Neuroscience Institute who was not involved with the work. "The study shows that the emotional value of a particular [location] can be modified, and, what is most critical, is that this can happen in a subconscious, sleep state."

Karim Benchenane, a neuroscience researcher at CNRS and ESPCI-ParisTech and his colleagues first identified a single place cell in the hippocampus of each mouse that fired when the animal was in a specific location and measured the average time each mouse spent in that location prior to any manipulation.

Then, when that particular place cell became spontaneously active during either an awake or sleep state, an automatic stimulation of the medial forebrain bundle—a part of the brain associated with positive reward sensations—was executed through a brain-computer interface. This stimulation has long been known to result in the release of dopamine neurotransmitters, similar to what happens when the mouse receives a food or some other reward. Each mouse received the stimulation either during an awake or sleeping state, but not both.

Read full, original article: Modifying Memories During Sleep