

Even rats may dream in pictures, study finds

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Researchers have reported what they say is some of the strongest evidence to date that animals, like humans, have dreams with images. Matthew A. Wilson and Dao-Yun Ji of the Massachusetts Institute of Technology in Cambridge, Mass., examined what happens in rats' brains as they "dream" about mazes they ran while awake.

A "dreaming" rat. (Courtesy MIT) In a previous study five years ago, Wilson found that rat brain cells replayed some of the same activity patterns in sleep as they did while running a maze. The scientists reasoned that this might reflect dreaming about the maze. But at that time, the researchers couldn't say whether images accompanied the replays. This is because the re-enactments were found to occur in the brain's memory center, the hippocampus, not in specifically visual areas of the brain. In a new experiment, Wilson and Ji recorded brain activity simultaneously in the hippocampus and the visual cortex, a key vision center of the brain. They found what they described as strong evidence that the replayed memories did contain pictures. "This work brings us closer to an understanding of the nature of an animal's dreams and gives us important clues as to the role of sleep in processing memories of our past experiences," Wilson said. Evidence that animals dream, even vividly, is not a new phenomenon. Cats with certain types of brain damage chase imaginary mice during the sleep stage associated with dreaming in humans, called rapid eye movement sleep. Wilson records the electrical signaling of individual brain cells to compare their activity in sleeping and waking. He also investigates how this activity may help cement memories in place, as dreams are theorized to do. The new work shows that the brain replays memories in two places at once "in the visual cortex and hippocampus," he said. These activities "may contribute to or reflect the result of the memory consolidation process," Wilson and Ji wrote in the study. It appeared in the Dec. 17 advance online edition of the research journal *Nature Neuroscience*.

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