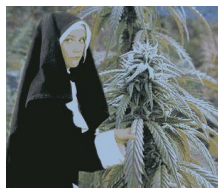


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By: Stefan Anitei, Science Editor



[Marijuana Affects Memory, Attention, Speech, Thinking](#)

This is provoked by its main component, cannabinol

Researchers at Rutgers University have found that the marijuana's active ingredient, tetrahydrocannabinol (THC), interferes with the synchronized activity between neurons in the hippocampus of rats and decreases brain waves, impairing this way memory formation.

The hippocampus is a brain part playing a central part in memory and spatial navigation. How exactly the weed acts on memories, attention and speech, among other things, has never been well understood. Normally, hippocampus neurons in that region form groups that trigger action potentials, or nerve impulses, together, especially theta waves.

When the researchers injected THC directly into the hippocampus, the synchronized pattern (tendency to occur at the same time) of the firing neurons was disrupted: even if they fired as much as before, it was in a more random pattern. Synchrony was also disturbed in other types of brain neurons, such as interneurons and pyramidal cells, although, interestingly, they were actually overactivated (explaining the random nature of thoughts provoked by the drug consumption).

Animals with less synchronized neural activity under the drug performed less well in a standard test of memory, thus synchronized neural firing is a must for normal hippocampal function. "Overall, our findings indicate that under the influence of cannabinoids, neurons are liberated from population control." The drug decreased significantly certain brain waves: the theta (4-12 hertz) and fast ripple (100-200 hertz) waves, whereas gamma (30 to 80 hertz) waves were slightly less affected.

Theta and gamma waves are thought to be crucial in creating and storing short-term memories, and fast ripple oscillations may turn short-term memories into long-term storage. If they are stopped, the rats will miss memories. Rats trained to do specific tasks turned very dazed after intravenous injections with marijuana. At the highest doses of THC, the rats failed to discover the right sequence of turns altogether. Thus, over a certain dose, the drug entirely prohibits learning.