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News & Comments

Scientists Found a New Memory Cell in the Brain Namely TORO

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It is a fact, that hippocampus has a vital role in memory and learning. Any change in the hippocampus is associated with the said function.

The sharp-wave ripples or SWR - high-frequency electrical spikes of brainwaves are formed in the hippocampus to convey a major event in episodic memory, like your childhood memories, first kiss, etc. These SWR can be recorded by electrography, but the mechanism behind their generation was unclear.

A team of scientists attempted to solve the mystery behind episodic memory and studied the particular neuron in the mouse hippocampus. Which led to the discovery of new types of neurons, associated with sharp-wave ripples and memory.

“We have found that this new type of neuron is maximally active during SWRs when the animal is awake - but quiet - or deeply asleep. In contrast, the neuron is not active at all when there is a slow, synchronized neuronal population activity called “theta” that can occur when an animal is awake and moves or in a particular type of sleep when we usually dream,” explained Professor Marco Capogna, a key author of the study.

This behaviour leads to its naming as TORO known as Theta Off-Ripples On.

The study also suggests that TOROs can release GABA neurotransmitters, which are inhibitory. The team now aims to link the activity between TORO cells and memory, along with their effect on dementia and Alzheimer’s diseases.

KEYWORDS

GABA, inhibition, disinhibition, sharp-wave ripple, hippocampus, muscarinic, medial septum, brain state, sleep, dementia, Alzheimer's disease, TORO, sharp-wave ripples