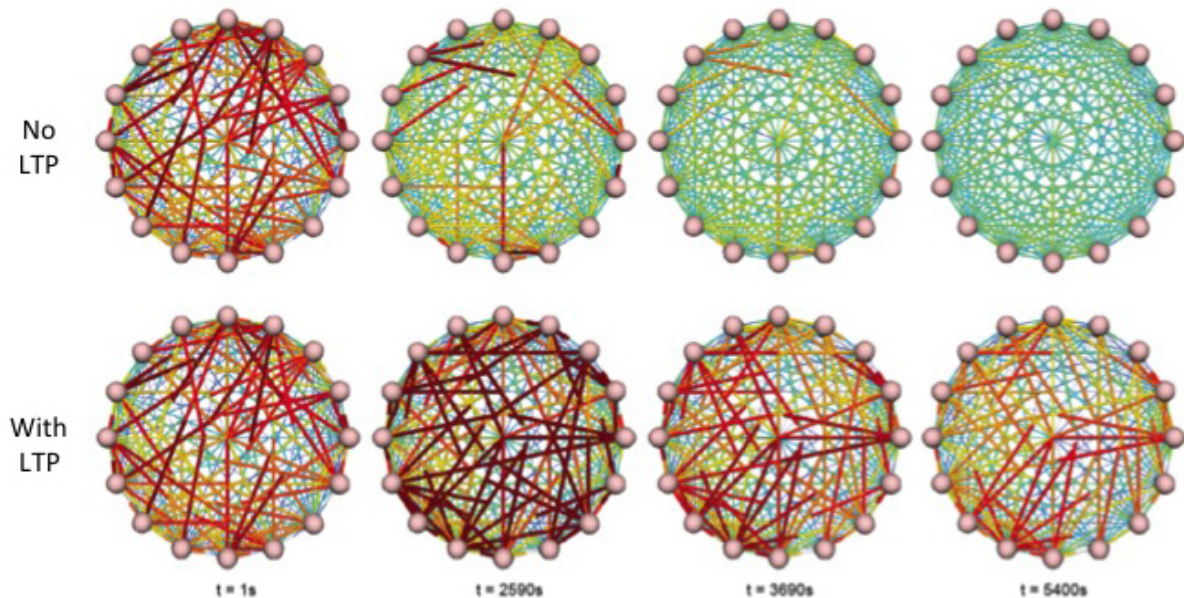


How sleep helps us learn and memorize

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Sleep is important for long lasting memories, particularly during this exam season. Research publishing in *PLOS Computational Biology* suggests that sleeping triggers the synapses in our brain to both strengthen and weaken, which prompts the forgetting, strengthening or modification of our memories in a process known as long-term potentiation. Credit: Blanco et al.

Sleep is important for long lasting memories, particularly during this exam season. Research publishing in *PLOS Computational Biology* suggests that sleeping triggers the synapses in our brain to both strengthen and weaken, which prompts the forgetting, strengthening or modification of our memories in a process known as long-term

potentiation (LTP).

Researchers led by Sidarta Ribeiro at the Brain Institute of the Federal University of Rio Grande do Norte, Brazil, measured the levels of a protein related to LTP during the sleep cycle of rats. The authors then used the data to build models of sleep-dependent synaptic plasticity.

The results show that sleep can have completely different effects depending on whether LTP is present or not. A lack of LTP leads to memory erasure, while the presence of LTP can either strengthen memories or prompt the emergence of new ones.

The research provides an empirical and [theoretical framework](#) to understand the mechanisms underlying the complex role of sleep for learning, which involves selective remembering as well as creativity.

More information: Blanco W, Pereira CM, Cota VR, Souza AC, Rennó-Costa C, Santos S, et al. (2015) Synaptic Homeostasis and Restructuring across the Sleep-Wake Cycle. *PLoS Comput Biol* 11(5): e1004241. [DOI: 10.1371/journal.pcbi.1004241](https://doi.org/10.1371/journal.pcbi.1004241)

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