

Brain activity patterns during sleep consolidate memory

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Why does sleeping on it help? This is the question tackled by new research at the University of Bristol, which reveals how brain activity during sleep sorts through the huge number of experiences we encounter every day, filing only the important information in memory.

The new discoveries, made by researchers from Bristol's Centre for

Synaptic Plasticity, provide further evidence for the benefits of a good night's sleep. This is important because the bad nights of sleep often experienced by both the healthy population, and people with schizophrenia or Alzheimer's disease, lead to impaired mental function.

The findings, published today in the journal *Cell Reports*, and put into context in an article in *Trends in Neuroscience*, show that patterns of [brain activity](#) that occur during the day are replayed at fast-forward speed during sleep.

This replayed activity happens in part of the brain called the hippocampus, which is our central filing system for memories. The key new finding is that sleep replay strengthens the microscopic connections between nerve cells that are active – a process deemed critical for consolidating memories. Therefore, by selecting which daytime activity patterns are replayed, sleep can sort and retain important information.

Lead researcher Dr Jack Mellor, from the School of Physiology, Pharmacology and Neuroscience, said: 'These findings are about the fundamental processes that occur in the brain during the consolidation of memory during sleep. It also seems that the successful replay of brain activity during [sleep](#) is dependent on the emotional state of the person when they are learning. This has major implications for how we teach and enable people to learn effectively.'

More information: Sharp-Wave Ripples Orchestrate the Induction of Synaptic Plasticity during Reactivation of Place Cell Firing Patterns in the Hippocampus. DOI: [dx.doi.org/10.1016/j.celrep.2016.01.061](https://doi.org/10.1016/j.celrep.2016.01.061)

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Provided by University of Bristol

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