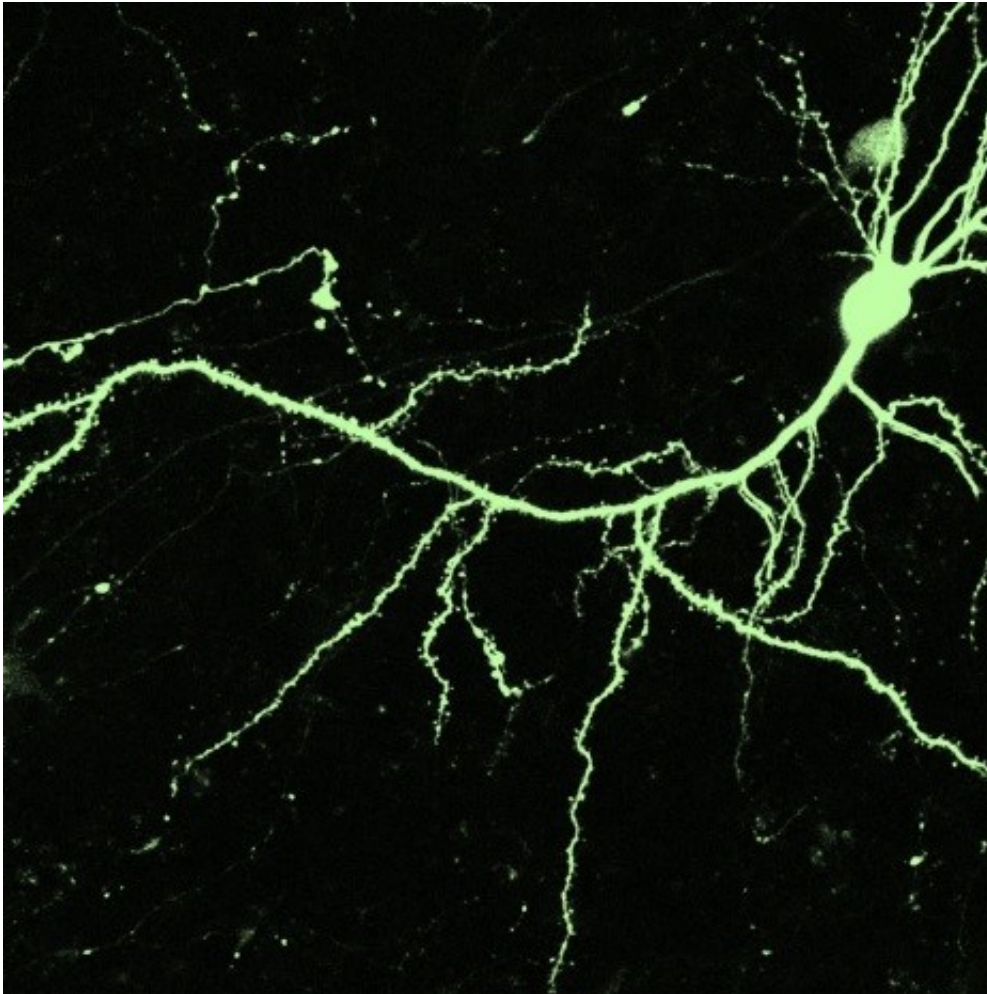


In vitro reproduction of long-lasting effects of stress on memory

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A neuron within a cultured slice labeled with a fluorescent protein. Tiny spines that protrude from tree-like cell fibers are the synapses. Scale: each side of the photograph is 200 μm .

A group of researchers at Osaka University, succeeded in reproduction of the same phenomenon as memory consolidation by using organotypic slice cultures of the cerebral cortex and revealed that stress interfered with memory consolidation. As cultures can be maintained for a long period, it is possible to examine long-term effects. This group's achievement will be useful for developing therapeutic methods for and preventive measures against stress-induced memory defects.

Keiko Tominaga-Yoshino, Associate Professor and Akihiko Ogura, Professor at Graduate School of Frontier Biosciences, Osaka University had previously found that repeated stimulus to organotypic slice cultures of the [cerebral cortex](#) formed new synapses, which is the same phenomenon as the repetition-dependent [memory consolidation](#) process, and examined its mechanism.

In this research, the group elucidated that synapse formation is inhibited by the reproduction of stress known to cause memory defects.

Humans and animals have innate self-protecting mechanisms for alleviating stress. This is why it was difficult to determine if the results of animal experiments were affected by the stress applied by experimenters or by the effects from animals' homeostatic response. Therefore, some conflicting results had been reported. However, in the in vitro system, the effects applied by experimenters can be directly examined and will be helpful for the development of drugs or treatments that reduce stress-related brain defects.

More information: Shinichi Saito et al. An in vitro reproduction of stress-induced memory defects: Effects of corticoids on dendritic spine dynamics, *Scientific Reports* (2016). [DOI: 10.1038/srep19287](https://doi.org/10.1038/srep19287)

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