

Prozac reorganizes brain plasticity

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Selective serotonin reuptake inhibitors (SSRI) such as Prozac are regularly used to treat severe anxiety and depression. They work by immediately increasing the amount of serotonin in the brain and by causing long term changes in brain function. However it can take weeks of treatment before a patient feels any effect and both beneficial effects and side effects can persist after treatment is stopped. New research published by BioMed Central's open access journal *Molecular Brain* investigates physiological changes within the brain that may be caused by SSRI treatment.

The hippocampus is an area of the brain involved in long term memory and spatial awareness, and is involved in symptoms afflicting people with Alzheimer's disease, such as loss of memory and disorientation. Neuronal cells in the hippocampus can change their activity and strength of connections throughout life, a process known as plasticity, which thought to be one of the ways new memories are formed. Altered plasticity is often associated with depression and stress.

Researchers from the Department of Pharmacology, Nippon Medical School, showed that chronic treatment of adult mice with fluoxetine (Prozac) caused changes to granule cells, one of the main types of neuronal cells inside the hippocampus, and to their connections with other [neuronal cells](#). The granule cells appeared to undergo serotonin-dependent 'dematuration', which increased their activity and reversed adult-type plasticity into an immature state. These changes to the cell's plasticity were associated with increased anxiety and in alternating between periods of hyper or hypo activity.

Katsunori Kobayashi explained, "Some of the side effects associated with Prozac in humans, such as anxiety and behavioral switching patterns, may be due to excessive dematuration of granule cells in the [hippocampus](#)."

More information: Behavioral destabilization induced by the selective serotonin reuptake inhibitor fluoxetine, Katsunori Kobayashi, Yumiko Ikeda and Hidenori Suzuki, *Molecular Brain* (in press).

Provided by BioMed Central

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