

# New drug elicits an antidepressant effect in mice in just two hours

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A team of researchers working at Nanjing Medical University in China, has developed a new antidepressant drug that elicits an antidepressant effect in mice in just two hours. In their paper published in the journal *Science*, the group describes their novel approach to treating depression.

Chronic [depression](#) is one of the most common forms of mental illness, and medical scientists have been hard at work searching for a cure. Most drugs used to treat the condition are [serotonin reuptake inhibitors](#) that reduce depression by targeting serotonin transporters—they are generically known as SERT drugs. They work by upping the levels of serotonin in the brain. Unfortunately, such drugs can take many weeks to have an impact, and they can also have serious side-effects, such as increasing the risk of suicide. In this new effort, the researchers took a new approach—disassociating SERT and an enzyme called neuronal nitric oxide synthase (nNOS.)

The researchers wondered what might happen if serotonin were disassociated from nNos in the mouse brain. They thought it might lead to reductions in the amount of serotonin in one part of the brain (the dorsal raphe nucleus) and increased amounts in another (the [medial prefrontal cortex](#).) The result, they theorized, should be a rapid improvement in symptoms of depression.

To find out, they developed a compound called ZZL-7. When injected into mice, it modified the firing of neurons that produce serotonin in the dorsal raphe nucleus, and in so doing, disrupted interactions between serotonin transporters and nNos. That led to increased amounts of serotonin in the medial prefrontal cortex, which, they suggest, would likely be felt in humans as a reduction in symptoms of depression. They also note that because the brain begins increasing the amount of [serotonin](#) in the medial prefrontal cortex almost right away, the effects of the compound should be felt within a couple of hours.

The researchers also suggest that disassociating SERT and nNos as a means of combating depression should also avoid the side effects so common in other therapies.

**More information:** Nan Sun et al, Design of fast-onset antidepressant by dissociating SERT from nNOS in the DRN, *Science* (2022). [DOI: 10.1126/science.abo3566](#)

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