



# Current Research in **Neuroscience**

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## Novel Memory-Enhancing Mechanism in Brain

*UC Irvine researchers have identified a novel mechanism in the brain that boosts memory.*

In collaboration with scientists at Germany's University of Munster, the UCI team found that a small protein called neuropeptide S can strengthen and prolong memories of everything from negative events to simple objects.

According to study leader Rainer Reinscheid, UCI Associate Professor of pharmaceutical sciences, the discovery could provide important clues about how the brain stores memories and also lead to new treatments for Alzheimer's disease, dementia and other cognitive impairments.

"Additionally, it may help us better understand post-traumatic stress disorder, which involves exaggerated memories of traumatic events," he said.

In tests on mice, the researchers observed that if neuropeptide S-receptors in the brain were activated immediately after a learning experience, it could be recalled for much longer and with much greater intensity.

This memory enhancement lasted up to a week, Reinscheid said, but when NPS receptor activation was disrupted, the mice didn't remember events as strongly -- if at all -- when tested just a day or two later.

Study results, which appear in a Dec. 8 advance online article for the journal *Neuropsychopharmacology*, are in accordance with Reinscheid's previous findings that NPS causes wakefulness and has a calming effect.

"It appears that the combination of increased alertness and reduced anxiety produced by NPS prepares the animals to learn much better," he said. "Memory is remarkably improved after activation of their NPS system, and the effects are long-lasting, independent of content."

Naoe Okamura, Celia Garau, Dee Duangdao and Stewart Clark of UCI as well as Kay Jüngling and Hans-Christian Pape of the University of Munster contributed to the study, which was funded in part by the National Institute of Mental Health.

Naoe Okamura, Celia Garau, Dee M Duangdao, Stewart D Clark, Kay Jüngling, Hans-Christian Pape, Rainer K Reinscheid. Neuropeptide S Enhances Memory During the Consolidation Phase and Interacts with Noradrenergic Systems in the Brain. *Neuropsychopharmacology*, 2010; DOI: 10.1038/npp.2010.207