You must remember this: Scientists develop nasal spray that improves memory

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Good news for procrastinating students: a nasal spray developed by a team of German scientists promises to give late night cram sessions a major boost, if a good night's sleep follows. In a research report featured as the cover story of the October 2009 print issue of The *FASEB Journal*, these scientists show that a molecule from the body's immune system (interleukin-6) when administered through the nose helps the brain retain emotional and procedural memories during REM sleep.

"Sleep to remember, a dream or reality?" said Lisa Marshall, co-author of the study, from the Department of Neuroendocrinology at the University of Lubeck in Germany. "Here, we provide the first evidence that the immunoregulatory signal interleukin-6 plays a beneficial role in sleep-dependent formation of long-term memory in humans."

To make this discovery, Marshall and colleagues had 17 healthy young men spend two nights in the laboratory. On each night after reading either an emotional or neutral short story, they sprayed a fluid into their nostrils which contained either interleukin-6 or a placebo fluid. The subsequent sleep and brain electric activity was monitored throughout the night. The next morning subjects wrote down as many words as they could remember from each of the two stories. Those who received the dose of IL-6 could remember more words.

"If a nasal spray can improve memory, perhaps we're on our way to giving some folks a whiff of common sense, such as accepting the realities of evolution," said Gerald Weissmann, M.D., Editor-in-Chief of

The FASEB Journal. "This is exciting piece of interdisciplinary science, since IL-6 had previously been considered a by-product of inflammation, not an agent that affects cognition."

More information: Christian Benedict, Jürgen Scheller, Stefan Rose-John, Jan Born, and Lisa Marshall. Enhancing influence of intranasal interleukin-6 on slow-wave activity and memory consolidation during sleep. *FASEB J*. 2009 23: 3629-3636. DOI: 10.1096/fj.08-122853

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