

# Dream discovery: Melatonin's key role in REM sleep revealed

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A significant breakthrough in the understanding of sleep mechanism opens new promise for treating sleep disorders and associated neuropsychiatric conditions: Scientists have pinpointed the melatonin

receptor MT1 as a crucial regulator of REM (Rapid Eye Movement) sleep.

REM sleep is crucial for dreaming, memory consolidation, and emotional regulation. In the brain, the melatonin MT1 receptor affects a type of neuron that synthesizes the neurotransmitter and hormone noradrenaline, found in an area known as the Locus Coeruleus, or "blue spot" in Latin.

During REM sleep, these neurons quiet down and stop their activity. Serious conditions such as Parkinson's disease and Lewy body dementia—which currently lack effective treatments—are linked to disruptions in REM sleep.

"This discovery not only advances our understanding of sleep mechanisms but also holds significant clinical potential," said Gabriella Gobbi, principal investigator of a new study [published](#) in the *Journal of Neuroscience*. She is a Professor of Psychiatry at McGill University, clinician-scientist at the McGill University Health Center, and Canada Research Chair in Therapeutics for Mental Health.

## **The science of snoozing**

Human sleep unfolds in a precise sequence of non-REM and REM stages, each serving distinct physiological functions. REM sleep plays a pivotal role in [memory consolidation](#) and emotional regulation. Non-REM sleep supports physical recovery and repair processes. Disruptions in this cycle can impair cognitive function and increase vulnerability to neuropsychiatric diseases.

Until now, the specific receptor triggering REM sleep had eluded scientists. The new study has identified the melatonin MT1 receptor as an important regulator of this sleep stage. Using a [novel drug](#) targeting

MT1 receptors, researchers successfully enhanced REM sleep duration in experimental animals, while simultaneously reducing neuronal activity.

"Currently, there are no drugs specifically targeting REM sleep. Most hypnotic drugs on the market, while extending total sleep duration, tend to adversely affect REM sleep," said Dr. Stefano Comai, co-senior author of the study and Professor at the University of Padua and Adjunct Professor at McGill University.

Further research into the neurobiology and pharmacology of REM sleep is crucial for developing targeted treatments that could improve the quality of life for patients affected by these debilitating diseases, according to the researchers. As scientists continue to explore the complexities of sleep regulation, the hope for effective interventions in neurological disorders grow increasingly promising.

**More information:** Martha López-Canul et al, Selective Enhancement of REM Sleep in Male Rats through Activation of Melatonin MT1 Receptors Located in the Locus Ceruleus Norepinephrine Neurons, *The Journal of Neuroscience* (2024). [DOI: 10.1523/JNEUROSCI.0914-23.2024](https://doi.org/10.1523/JNEUROSCI.0914-23.2024)

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