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THEME: 3B Nervous system Série S

**How Muscles Are Paralyzed During Sleep: Finding May Suggest New
Treatments for Sleep Disorders**

During REM sleep -- the deep sleep where most recalled dreams occur -- your eyes continue to move but the rest of the body's muscles are stopped. In a series of experiments, University of Toronto neuroscientist Patricia L. Brooks found that the neurotransmitters gamma-aminobutyric acid (GABA) and glycine caused REM sleep paralysis in rats by "switching off" the specialized cells in the brain that allow muscles to be active.

5 The researchers measured electrical activity in the facial muscles responsible for chewing of sleeping rats. Brain cells called trigeminal motor neurons communicate the brain's message to move to these muscles. Previous research suggested neurotransmitter receptors called ionotropic GABA_A/glycine receptors in the motor neurons caused REM sleep paralysis. However, when the

10 researchers blocked these receptors, REM sleep paralysis still occurred.

The researchers found that to prevent REM sleep paralysis, they had to block both the ionotropic receptors *and* metabotropic GABA_B receptors, a different receptor system. In other words, when the motor cells were cut off from all sources of GABA and glycine, the paralysis did not occur, allowing the rats to exhibit high levels of muscle activity when their muscles should have been

15 inactive. The data suggest the two neurotransmitters must both be present together to maintain motor control during sleep, rather than working separately.

The finding could be especially helpful for those with REM sleep disorder, a disease that causes people to act out their dreams. This can cause serious injuries to patients and others around them. It is also often an early indicator of neurodegenerative diseases, such as Parkinson's.

From ScienceDaily (July 17, 2012)

Sum up this article and explain the main ideas using your scientific knowledge