

Researchers reverse effects of sleep deprivation

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Researchers at Wake Forest University School of Medicine have shown that the effects of sleep deprivation on cognitive performance can be reversed when the naturally occurring brain peptide, orexin-A, is administered in monkeys.

Their results are published in this week's Journal of Neuroscience.

“These findings are significant because of their potential applicability,” said Samuel A. Deadwyler, Ph.D., professor of physiology and pharmacology at Wake Forest. “This could benefit patients suffering from narcolepsy and other serious sleep disorders. But it also has applicability to shift workers, the military and many other occupations where sleep is often limited, yet cognitive demand remains high.”

Orexin-A, also known as hypocretin-1, is a naturally occurring peptide produced in the brain that regulates sleep. It's secreted by a small number of neurons but affects many brain regions during the day and people who have normal amounts of orexin-A are able to maintain wakefulness. When people or animals are sleep-deprived, the brain attempts to produce more orexin-A, but often without enough success to achieve alertness past the normal day-night cycle.

The research team, consisting of Linda Porrino, Ph.D., and Robert Hampson, Ph.D, also of Wake Forest, and Jerome Siegel, Ph.D., of the University of California at Los Angeles, studied the effects of orexin-A on monkeys that were kept awake overnight for 30 to 36 hours with

videos, music, treats and interaction with technicians, until their normal testing time the next day. They were then allowed to perform their trained tasks with several cognitive problems that varied in difficulty, and their performance was significantly impaired.

However, if the sleep deprived monkeys were administered orexin-A either intravenously or via a nasal spray immediately prior to testing, their cognitive skills improved to the normal, non-sleep-deprived, level. The researchers also noted that when the monkeys received the orexin-A via the intranasal spray they tested higher than when it was administered intravenously.

Source: Wake Forest University Baptist Medical Center

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