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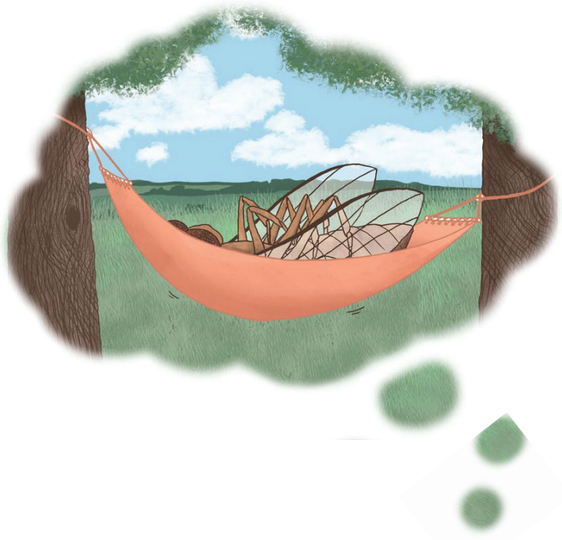
Learning From Drowsy Flies



Learning from Drowsy Flies

Who knew that fruit flies slept—or that humans might benefit from studying their sleep? Kyunghee Koh, PhD, does. The associate professor of Neuroscience uses fruit flies (*Drosophila melanogaster*) to identify the cellular and molecular mechanisms underpinning sleep. Two of her lab's recent studies offer results that are both interesting and potentially far-reaching.

The first study explored a phenomenon most humans experience: being lulled to sleep by motion or vibration. "Babies like to be rocked to sleep, but the neural mechanisms underlying this phenomenon remain largely a mystery," Dr. Koh explains. "We used the fruit fly to study the mechanisms of sleep induction via vibration."

The researchers found that flies sleep longer during vibration; are less responsive to light pulses that would otherwise wake them; and are better able to function well with less sleep afterward. They also discovered that the amount of extra sleep during vibration depends on flies' genetic background.

The second study explored sleep-related decision making. "The fly brain is constantly doing a sophisticated cost-benefit analysis of what behaviors to pursue in particular circumstances," Dr. Koh says. In the latest of a series of studies on decision making, the researchers looked at how the need for food would affect fruit flies' choice of whether to sleep or mate. Male flies that were deprived of an important source of protein chose sleep; their well-nourished counterparts chose to mate.

"It turns out protein is necessary for flies' offspring to survive," explains Dr. Koh. "So, these malnourished males decided that even a successful mating was less likely to produce live offspring, and chose sleep over courtship." The findings of this study offer new paths for the Koh lab's continuing exploration of the molecular basis of behavior. ■ KM, MM