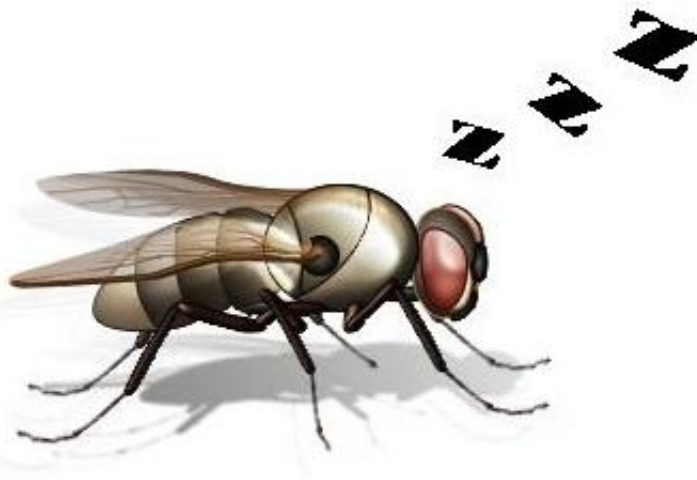


Study in fruitflies strengthens connection among protein misfolding, sleep loss, and age

February 20 2014



This is a sleepy fruitfly. Credit: Jini Naidoo, Ph.D., Perelman School of Medicine

Pulling an "all-nighter" before a big test is practically a rite of passage in college. Usually, it's no problem: You stay up all night, take the test, and then crash, rapidly catching up on lost sleep. But as we age, sleep patterns change, and our ability to recoup lost sleep diminishes.

Researchers at the Perelman School of Medicine, University of Pennsylvania, have been studying the molecular mechanisms underpinning sleep. Now they report that the pathways of aging and

sleep intersect at the circuitry of a cellular stress response pathway, and that by tinkering with those connections, it may be possible to alter [sleep patterns](#) in the aged for the better – at least in fruit flies.

Nirinjini Naidoo, PhD, associate professor in the Center for Sleep and Circadian Neurobiology and the Division of Sleep Medicine, led the study with postdoctoral fellow Marishka Brown, PhD, which was published online before print in the journal *Neurobiology of Aging*.

Increasing age is well known to disrupt sleep patterns in all sorts of ways. Elderly people sleep at night less than their younger counterparts and also sleep less well. Older individuals also tend to nap more during the day. Naidoo's lab previously reported that aging is associated with increasing levels of protein unfolding, a hallmark of cellular stress called the "unfolded protein response."

Protein misfolding is also a characteristic of several age-related neurodegenerative diseases, such as Alzheimer's and Parkinson's diseases, and as it turns out, also associated with [sleep deprivation](#). Naidoo and her team wanted to know if rescuing proper protein folding behavior might counter some of the detrimental sleep patterns in elderly individuals.

Using a video monitoring system to compare the [sleep habits](#) of "young" (9

Provided by University of Pennsylvania School of Medicine

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