Sleeping is cool, at least for your brain!

Seema Singh - Monday, April 06, 2009 10:18 AM

Why do we need sleep? This question has been one of the most enduring puzzles of biology; some scientists proposing that sleep helps in memory and learning, others arguing that it conserves energy.

One of the more recent hypotheses has been of the so-called ‘synaptic homeostasis’ in the brain which means sleep cools down synapses – junctions in the brain where neurons talk to each other -- that get heated up (over stimulated) during the day’s neural activity.

In this week’s Science, two new studies provide strong evidence to the new hypothesis in fruit flies, which had earlier been shown in rodents and humans.

(An earlier story on sleep in Mint explains why fruit flies studies in neuroscience are significant.)

One study by researchers of the University of Wisconsin shows that when fruit flies were deprived of sleep, the level of synaptic proteins in the brain went up; the levels dropped after flies caught their wink. Another study by researchers of the Washington University finds a similar increase and decrease in the number of synapses in the brain.

Using a simplistic analogy, synapses are like opening browsers (from experience I’d say Internet Explorer), which during a hectic day users open a tad too many, often realizing that it causes the system to slow down, or even hang sometimes. Sleep is akin to closing some of these windows, which use up too much RAM in your hardware, and restores the health of the computer.

In other words, sleep ensures that your brain bandwidth doesn’t max out!

However, there are contradictory findings. A publication in Neuron recently showed that synapses grew stronger during sleep in the visual cortex of cats. That sure means sleep does more than just cool the synapses. And the sleep mystery continues, though the layers are unraveling, bit by bit.

But there are two reasons why I dwell on sleep (or wakefulness), be it in blog posts or regular stories: one, there are just too many fascinating new findings from sleep research; secondly, for long, high-flying, super-successful executives, scholars, businesspersons et al have glamorized fewer hours of sleep.

In reality, that’s not true. Sleep lets our brain multitask, just as we think we do in our waking hours!