



Chemical Engineering Special Seminar

Lecture Hall 6, Wolfson Department of Chemical Engineering

January 20, 2016, Wednesday, 13:30

Yuval Nir, Ph.D

Department of Physiology and Pharmacology, Sackler School of Medicine,
and Sagol School of Neuroscience, Tel Aviv University

New insights on sleep and consciousness

In the first part of the talk, I will present recent findings on local oscillations during sleep and sleepiness, supporting an emerging view that “islands” of regional sleep and wake can coexist. Oscillations such as slow waves and sleep spindles were found to occur mostly locally in the brain during sleep. Moreover, in both rats and humans, local populations of neurons show "local sleep" upon sleepiness, leading to lapses of attention. Opto/pharmacogenetics in mice shows that cortical populations that were experimentally kept in a “wake-like” mode while the animal sleeps exhibit rebound in slow wave activity during subsequent recovery (they show deeper sleep), demonstrating local sleep regulation.

In the second part of the talk, I will discuss our lab’s new research focus – the neuronal basis of sensory disconnection – why are we not aware of our surroundings during sleep and anesthesia? The traditional view was that during sleep, the thalamus acts as a gatekeeper and 'blocks' the signals from reaching the cerebral cortex. However, our recent findings show that brain responses to external stimuli such as sounds are well preserved in primary sensory cortices. Instead, we are currently exploring the potential role of neuromodulatory systems (and the locus coeruleus-noradrenaline system in particular) in mediating sleep disconnection.

Refreshment served since 13:15