

Is a good night's sleep crucial for your health?

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In spring 2005 a large European research and training network was established to investigate the causes and implications of poor sleep from a medical as well as from a social point of view. This EU-financed sleep research project, “The biomedical and sociological effects of sleep restriction”, is coordinated by Dr. Tarja Porkka-Heiskanen (Stenberg) MD, PhD, at the University of Helsinki, Institute of Biomedicine.

The topic of the project is important and timely: our environment is changing to a 24/7 society, which inevitably means that time spent in sleep decreases. What are the consequences of this reduction for human health and well-being? This is the central question of the present consortium.

The training network consists of 16 young Marie Curie Fellows from 12 countries, who are trained in the six consortium laboratories by experienced mentors. They are researching the role of sleep in the quality of life; in mood disorders, and how it can affect performance, accident rates, and cardiovascular diseases. Animal models complement the project aiming to understand the basic mechanisms underlying sleep regulation and thereby provide recommendations for the development of new hypnotics.

Although the work is only half way through, interesting results have already emerged, and the project has now been nominated as one of the “success stories” among EU-funded projects.

The Helsinki group has investigated the effect of partial sleep loss on human health using an experimental setup that resembles a normal working week. They found that following sleep restriction to 4 hours per night, an individual's ability to perform complex tasks gradually decreased during the five days. Several changes in their immunological system were also recognized, e.g. increase in CRP (C-reactive protein), an indicator of defense reaction.

The Sociology of Sleep Group at the University of Surrey has shown the diverse ways in which the social context of everyday life has profound influences on sleep quality. In-depth interviews with women in Italy show how women's sleep is severely disrupted by care-giving roles, especially for frail elderly relatives. Analysis of large-scale surveys has found strong social inequalities in sleep problems with poorer sleep recorded for people living in more disadvantaged social circumstances, such as with low income and low educational attainment. The Chronobiology Group at the University of Surrey has been investigating the effect of blue short wavelength light on circadian rhythms and sleep in the young and elderly. A reduced responsiveness to short wavelength light has been observed in older people and this may have implications for the design of lighting in elderly homes.

The group in Munich and Ingolstadt has first evidence for an influence of a chronic sleep disorder going along with severe sleepiness (narcolepsy) on the processing of emotional stimuli in the brain, suggesting that disturbed sleep regulation profoundly interferes with our well being and the interaction with the environment.

Basic research in the human sleep research laboratory of the University of Zürich revealed clear age-related changes in the impairment of sustained vigilant attention after one night without sleep. This finding is consistent with epidemiological studies and has important implications for the prevention of accidents associated with the loss of sleep.

The group from the University of Zurich, dedicated to animal research, recorded sleep in different mouse models under normal conditions and under enhanced sleep pressure attained by sleep deprivation of a few hours. The effect of pharmacological stimulation of different types of GABAA receptors was investigated. This research aims at opening new avenues for the development of hypnotics. The hypnotic efficacy, when based on normal sleep physiology, should be optimized and lead to less adverse effects.

The mentors recognize the pressing need to bring the results of this research network available to all people. Training of the Fellows includes, in addition to the scientific training, also training in communication with the general public. The Fellows are encouraged to write articles and give general presentations – each of them has written a description of their work.

The other partners are from UK (University of Surrey), Belgium (Université Libre de Bruxelles), Germany (Max Planck Institute for Psychiatry & Center of Mental Health, Klinikum Ingolstadt) and Switzerland (University of Zurich).

Source: University of Helsinki

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