



UNIVERSITÉ
DE GENÈVE

PRESS RELEASE

Geneva | January 23th, 2019

WARNING: embargoed until January 23th, 2019, 4pm GMT

Unil

UNIL | Université de Lausanne



Hôpitaux
Universitaires
Genève

To sleep well, let yourself be rocked!

Researchers from UNIGE, HUG and UNIL demonstrate the benefits of swaying on both sleep and memory, and offer a new perspective in the fight against sleep disorders.

Anyone who has ever put a baby to sleep by gently cradling it or has ever taken a nap in a hammock knows that rocking promotes sleep. But why? To understand this phenomenon and the brain mechanisms at stake, researchers from the universities of Geneva (UNIGE), Lausanne (UNIL) and from the University Hospitals of Geneva (HUG) have conducted two studies: one on young adults and the other on mice. Their results, published in *Current Biology*, show that slow and repeated movement throughout the night modulates brain wave activity. Consequently, not only does balancing induce deeper sleep, but it also helps to strengthen memory, which is consolidated during certain sleep phases.

UNIGE scientists had already shown in a previous study that swaying during a 45-minute nap helps people fall asleep faster and sleep more deeply. But what are the effects of this slow movement on the brain? To find out more, the researchers, in association with colleagues from UNIL, conducted two new studies – one on human beings and the other on rodents – as part of a joint SNSF grant that allows researchers in basic and clinical research to work together on a common issue.

The first study, led in Geneva by Laurence Bayer, a researcher at the Department of Basic Neurosciences at UNIGE Faculty of Medicine and at the HUG Sleep Medicine Centre, and Sophie Schwartz, Full Professor at the Department of Basic Neurosciences at UNIGE Faculty of Medicine, explores the impact of continuous rocking on sleep and on the brain waves that characterize it. Eighteen healthy young adults spent one night at the HUG Sleep Medicine Centre to make polysomnographic recordings during which several physiological variables were recorded (heart rate, respiratory rate, electroencephalogram, etc.). Once familiar with this unusual environment, the young volunteers spent two nights at the Sleep Medicine Centre, one on a moving bed and the other on the same bed, but in a still position.

“A good night’s sleep means falling asleep quickly and staying asleep all night,” says Laurence Bayer. “However, we observed that our participants, although they slept well in both cases, fell asleep more quickly when they were rocked. In addition, they had longer periods of deep sleep and fewer micro-wakes, a factor frequently associated with poor sleep quality.”



© UNIGE

Laurence Bayer, a researcher at the Department of Basic Neurosciences at UNIGE Faculty of Medicine and at the HUG Sleep Medicine Centre.

High resolution pictures

Swinging synchronizes brain waves

The reinforcement of deep sleep by rocking is the direct consequence of the modulation of brain wave activity during sleep. Thus, continuous rocking makes it possible to synchronize the neural activity of the thalamocortico-cortical networks, which play an important role in the consolidation of sleep, but also of memory. “To see if this effect also affected memory, we subjected our participants to memory tests: they had to learn pairs of words in the evening and remember them in the morning when they woke up,” explains Aurore Perrault, a researcher at the UNIGE Faculty of Medicine and the first author of this study. “And here too, rocking proved beneficial: the test results were much better after a night in motion than after a still night!”

The second study was carried out in Lausanne, in mice, under the direction of Paul Franken, Associate Professor at UNIL Faculty of Biology and Medicine. Like for human beings, rocking the mice’s cages reduced the time they needed to fall asleep and increased sleep time. However, it did not increase sleep quality, unlike what had been shown in human beings.

The vestibular system involved

The study conducted in Lausanne highlighted another key player in the quality of sleep: the vestibular system. Located in the inner ear, it manages balance and spatial orientation. “We have subjected two groups of mice to the same rocking: a group with non-functioning sensory receptors in the inner ear and altered vestibular function, and a control group. Unlike the control mice, the mice in the first group did not benefit from any effect of swaying during sleep,” says Konstantinos Kompotis, a researcher at the Faculty of Biology and Medicine at UNIL and the study’s first author. “Vestibular sensory stimulation during rocking therefore acts on the neural networks responsible for the specific brain oscillations during sleep.”

To better identify the subcortical structures and neural networks involved in the effects of rocking on sleep, researchers will now use other techniques, such as optogenetics, to observe and control specific neurons. “It is now a question of deciphering the structures, and even the precise neural populations, that receive stimuli from the vestibular organs before transferring them to sleep circuit structures,” adds Paul Franken. “Mapping the communication network between the two systems would make it possible to develop new approaches to treat patients suffering from insomnia, mood disorders, as well as elderly people, who often suffer from sleep and memory disorders,” conclude the Swiss scientists.



Paul Franken, Associate Professor at UNIL Faculty of Biology and Medicine.

© UNIL

contact

Laurence Bayer

Researcher at the Department of Basic Neurosciences
Faculty of Medicine, UNIGE
HUG Sleep Medicine Centre
+41 22 379 54 55
Laurence.Bayer@unige.ch

DOI: 10.1016/j.cub.2018.12.028

Paul Franken

Associate Professor
Faculty of Medicine, UNIL
+41 21 692 39 72
paul.franken@unil.ch

DOI: 10.1016/j.cub.2018.12.007

UNIVERSITÉ DE GENÈVE Communication Department

24 rue du Général-Dufour
CH-1211 Geneva 4

Tel. +41 22 379 77 17

media@unige.ch

www.unige.ch