EDITORIAL

Sleep Science

The recognition of Chronobiology in Science

Moreno CRC[1,2]

[1] Department of Health, life cycle and society, School of Public Health, University of São Paulo, Brazil.
[2] Stress Research Institute, University of Stockholm, Sweden.

We were delighted to receive the news in December 2017 that the Nobel Prize in Physiology or Medicine was awarded to three researchers for discoveries concerning the molecular mechanisms of the temporal system of organisms. Jeffrey Hall, Michael Rosbash and Michael Young uncovered mechanisms that regulate genes in fruit flies from the studies of Seymour Benzer and Ronald Knopka, who were the first to identify one of the genes later studied by the laureates. As is well known to our readers, studies related to the field of Biology that studies biological rhythms, Chronobiology, are part of the scope of Sleep Science journal.

The so-called "clock genes" are involved in an endogenous process of organisms that allowed them to adjust to the temporal variations of the environment. Throughout evolution, living beings have adapted not only to environmental niches, but also to temporal niches. This was only possible due to its ability to anticipate the occurrence of recurrent and periodic environmental events originating from terrestrial movements such as day and night alternation or seasonal variations of the environment. Night and day living beings survived and adapted to the temporal niche of the environment in which they lived. The human species shows a pattern of activity and daytime rest, that is, we are in a state of wakefulness during the day and sleep at night. Jeffrey Hall, Michael Rosbash, and Michael Young were therefore among the many researchers who contributed to unraveling the molecular basis of the endogenous "time estimation" process and, consequently, the synchronization of the organism with the environment. Obviously, the complexity of this process can not be reduced at the cellular level, but the use of drosophila as experimental models was a starting point for such discoveries. In the case of the human species, synchronization occurs between an endogenous period of approximately 24 hours, which we divide between sleep and wakefulness, with alternation of day and night. In addition, the functions of the human body follow an internal temporal order. Body temperature, for instance, is lower at night whereas the hormone cortisol is higher in the early morning (when the awakening is coming). The functions of the human organism (or biological rhythms) therefore vary rhythmically, sequentially, and synchronized within 24 hours of the environment.

The human endogenous temporal system has such a plasticity that it allows the organism to adjust to time zone changes, such as daylight saving time, as well as the variations of the seasons. The speed of this time adjustment varies from one person to another. Some are drowsy throughout the daylight saving time period, others in a day or two are adjusted to the imposition of a new social time marker. It is important to emphasize, however, that our diurnal character has been established throughout the evolutionary process of the species. Working at night, waking up before meeting sleep needs, restricting sleep during the workweek, or eating at inappropriate times are practices that go against the diurnal nature of the body, and may lead to a number of consequences that are very well described in the scientific literature. The inadequacy of working hours and work schedules, school start-up times and drug administration, to name a few factors, contribute to the development (or aggravation) of various diseases, impair our cognitive performance, and increase the odds of accidents.

As editorial board, we believe that the 2017 Nobel Prize was a large step for the recognition of the relevance of chronobiology in science, and in our professional practice. We hope you enjoy this number of our journal, which put together studies regarding sleep and biological rhythms as usual!

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