

OIST PRESIDENTIAL LECTURE

The Molecular Circadian Clock and its impact on Health and Disease

Wed, **Sep. 18**

Sydney Brenner Lecture Theater (B250)

13:30 to 15:00

Circadian rhythms are a fundamental process of all life. They allow organisms to change and adapt to 24-hour changes in the physical environment, but it is only in the past two decades that the field of circadian rhythms has become central to biomedical research. This Presidential Lecture will describe the rapid evolution of our understanding of molecular and genetic mechanisms underlying the circadian clock, and how internal timing systems regulate the generation of hundreds of molecular, cellular, physiological, and behavioral rhythms in all cells of the body. The lecture will also focus on work to understand how disruption of circadian timing can lead to mental and physical disorders. The discovery of the first circadian clock gene in fruit flies in the 1980s, which was awarded the Nobel Prize in 2017, laid the foundation for the development of a deep understanding of circadian rhythms in mammals, and their importance for human health. Dr. Turek will make the argument that - just as Einstein advanced the prevailing idea of one-dimensional time to a new concept of four-dimensional space-time - the merging of time-based biology with existing three-dimensional research in biomedicine will revolutionize modern, personalized healthcare, leading to new Clock and Time based diagnostic technologies and treatment strategies.

Prof. Fred W. Turek, PhD

*Charles E. & Emma H. Morrison Professor of Biology, Northwestern University
Director, Center for Sleep & Circadian Biology*

Dr. Fred Turek is Director of the Center for Sleep & Circadian Biology and Charles & Emma Morrison Professor of Biology in the Department of Neurobiology at Northwestern University in the United States. He is the founder and first President of the Society for Research on Biological Rhythms and has served as a consultant to numerous government agencies, most notably the Defense Department, NASA and the NIH. Researchers in the Turek laboratory study sleep and circadian rhythms. Dr. Turek has published more than 370 original scientific articles and reviews. In addition to work using rodent models, the Turek Laboratory has established extensive collaborations with clinical researchers. Studies in humans are aimed at shifting the human clock in an attempt to alleviate mental and physical problems. Turek's sleep, circadian and metabolic studies focus on how disruption in these interactions can lead to obesity, diabetes, and cardiovascular disease. His most recent human work involves studying the microbiome of identical twin astronauts, one on the ground, and the other on the International Space Station.

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