

NOVEMBER 27, 2000

Clockwork Genes: Holiday Lectures Explore the Biological Basis of Circadian Rhythms

Teenagers tend to have a harder time functioning in the morning than their parents do. Long flights can cause jet lag. Both phenomena are related to "biological clocks," molecular mechanisms that regulate how humans and other organisms sleep, wake and function throughout a 24-hour day. And if "the early bird gets the worm," it's because birds also have a built-in clock that helps them to rise before the sun.

High school students in the Washington, D.C., area and throughout the world will learn about biological clocks during the annual Holiday Lectures on Science, December 4 and 5 at the Howard Hughes Medical Institute. HHMI investigators Michael Rosbash and Joseph S. Takahashi will explore the inner workings of circadian clocks—the molecular timepieces that keep pace with the 24-hour cycle of day and night, enabling organisms to adapt to daily and even seasonal changes in their environment.

In a program entitled *Clockwork Genes: Discoveries in Biological Time*, Rosbash and Takahashi will address an international audience of students, teachers and others by satellite and the World Wide Web. The Institute will host a live audience of approximately 200 high school students at its headquarters in Chevy Chase, Md., and HHMI-supported science education programs will host live student audiences in Miami, Fl. and Philadelphia, Pa. A group of Russian students and teachers will watch the lectures and participate live from Moscow in an interactive question and answer session with the lecturers.

Rosbash and Takahashi have done groundbreaking work in identifying the genes that encode the biological clocks of fruit flies and mice. Drawing on their research, they will demonstrate how their findings apply to humans.

Rosbash will explain the common fruit fly's importance to genetic research, including behavioral genetics. A professor of biology at Brandeis University and of molecular biology at Massachusetts General Hospital, Rosbash studies the molecular workings of the biological clock in the fruit fly *Drosophila*.

Takahashi will discuss how biological rhythms are tied to the physical environment in which organisms have evolved. A professor of neurobiology

and physiology at Northwestern University and of neurology at Northwestern University Medical School, Takahashi discovered the first circadian rhythm gene in mammals, the mouse gene called *Clock*, an acronym for "circadian locomotor output cycles kaput."

The lectures will be Webcast and broadcast by satellite live starting at 10 a.m. (EST) on December 4 and 5. From 1:30 to 2:30 p.m. on both days, the speakers will answer questions live online at www.asklive.org. Viewers also can e-mail questions in advance, to asklive@hhmi.org. The lectures will be rebroadcast by satellite on both afternoons, beginning at 2:30 p.m.

The Holiday Lectures Web site (www.holidaylectures.org) also offers teacher resources, lecture summaries and links to "virtual laboratories." Teachers who register in advance receive free guides to help them integrate the Holiday Lectures with their curricula. In addition to the Holiday Lectures features, HHMI's Web site provides information about the biomedical research that HHMI scientists conduct and the science education grants that the Institute awards, as well as interactive experiences and resources for science teachers and students.

HHMI is a medical research organization whose scientists conduct biomedical research at 72 universities and academic medical centers nationwide. The Institute also spends more than \$105 million annually on science education programs across the country, the largest privately funded science education initiative in U.S. history.

Satellite coordinates for the Holiday Lectures: C-Band Telstar 4, Transponder 23 - 89 Degrees West Longitude Vertical Downlink, Frequency 4160 MHz Ku-Band SBS-6, Transponder 15 - 74 Degrees West Longitude Horizontal Downlink, Frequency 12068 MHz

For more information on satellite broadcasts, see:
www.hhmi.org/grants/lectures/satellite.htm

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