FEATURED LECTURES

DIALOGUES BETWEEN NEUROSCIENCE AND SOCIETY

Support contributed by: Elsevier

Fei-Fei Li, PhD
Stanford Human-Centered AI Institute
Saturday, October 19, 11 a.m.–1 p.m.

PETER AND PATRICIA GRUBER LECTURE

Molecular Basis of the Circadian Clock in Mammals and Its Fundamental Role in Aging and Longevity

Joseph S. Takahashi, PhD
University of Texas Southwestern Medical Center and Howard Hughes Medical Institute
Support contributed by: The Gruber Foundation
Sunday, October 20, 2:30–3:40 p.m.

The molecular basis of circadian clocks involves a 24-hour autoregulatory transcriptional network that is cell-autonomous and widely expressed. The suprachiasmatic nucleus acts as master pacemaker, but peripheral oscillators can respond to proximal signals. In addition to behavior and physiology, the clock gene network interacts directly with many other pathways in the cell. With respect to metabolism, the timing of nutrient consumption is critical, and restricting the timing of feeding has many health benefits that impact aging, health span, and longevity.

HISTORY OF NEUROSCIENCE LECTURE

Exocytosis of Synaptic Vesicles: From Quantal Release to Molecular Machines 50

Reinhard Jahn, PhD
Max Planck Institute for Biophysical Chemistry
Monday, October 21, 10–11:10 a.m.

At chemical synapses, depolarization-induced calcium influx triggers neurotransmitter release, a key step in synaptic signaling. In the 1950s, Katz found that transmitter release is quantal, and synaptic vesicles were discovered. In the following decades, recycling routes for synaptic vesicle and for neurotransmitters were worked out, but only since the mid-1980s are the molecular mechanisms governing the steps in synaptic vesicle cycling becoming known. The history of the field will be briefly reviewed, focusing on exocytosis and membrane fusion.

FEATURED LECTURES

ALBERT AND ELLEN GRASS LECTURE

Neural Learning Rules in the Cerebellum **CME**

Jennifer L. Raymond, PhD
Stanford University School of Medicine
Support contributed by: The Grass Foundation
Monday, October 21, 3:15–4:25 p.m.

The cerebellum is known for its role in motor learning, and is increasingly implicated in cognitive functions such as navigation, reward prediction, emotion, and social behavior. Its simple, repeated circuit architecture facilitates study of the functional links between events occurring at the molecular, cellular, circuit and behavioral levels as the cerebellum computes. By leveraging this analytical advantage, recent work has yielded new insight in the principles governing how neural circuits tune their performance through experience.

DAVID KOPF LECTURE ON NEUROETHICS

The Neuroethics Frontier

Nita Farahany, JD, PhD
Duke University
Support contributed by: David Kopf Instruments
Tuesday, October 22, 2:30–3:40 p.m.

How should we think about our emerging capabilities of accessing and altering human brains, particularly in light of advances in genome-editing technologies? This lecture will focus on the ethical, legal, and social issues arising from accessing and altering human brains. It will discuss consumer neuro-technologies, corporate interests in accessing and changing brains, and government attempts to do the same. It will also consider the current and future potential directions of these neuroethical issues, particularly in light of recent controversies about human genome-editing.