Featured Lectures

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Dialogues Between Neuroscience and Society

Magic, the Brain, and the Mind
Speakers: Apollo Robbins, Eric Mead
Support contributed by Elsevier
Saturday, Oct. 17, 11 a.m.–1 p.m.
McCormick Place: Hall B1


The Dialogues presentation features internationally known magicians Apollo Robbins and Eric Mead. The speakers will explore how attention, memory, and perception inform the art and practice of illusion and magic. This event includes brief demonstrations and a panel discussion with Robbins and Mead, followed by questions from the audience.

Presidential Special Lecture

Origins of Abstract Knowledge: Number and Geometry CME
Speaker: Elizabeth Spelke, PhD
Harvard University
Support contributed by Pfizer, Inc.
Saturday, Oct. 17, 5:15–6:25 p.m.
McCormick Place: Hall B1

How does the human brain apprehend concepts such as seven or square? Studies of human infants, animals, children, and adults in diverse cultures suggest these concepts arise from a set of foundational cognitive systems for representing objects, approximate quantities, and the navigable spatial layout. As preschool children learn to talk, count, and interpret visual symbols, they combine their representations of things, quantities, and places in uniquely human ways and take their first steps toward abstract mathematics.

Fred Kavli Distinguished International Scientist Lecture

Moving in an Uncertain World: Computational Principles of Human Motor Control CME
Speaker: Daniel M. Wolpert, MD, PhD
University of Cambridge, United Kingdom
Support contributed by The Kavli Foundation
Sunday, Oct. 18, 10–11:10 a.m.
McCormick Place: Hall B1

The ease with which we move our bodies masks the true complexity of the control processes involved. While computers can beat Grandmasters at chess, no robot comes close to matching the dexterity with which a young child can manipulate a chess piece. This talk reviews a major factor that makes control hard, the uncertainty about our body and the world as reflected in sensory and motor signals, and the mechanisms used by the brain to control movement in the face of this uncertainty. More information at www.wolpertlab.com.

Peter and Patricia Gruber Lecture

Circadian Rhythms, the Transcriptional Feedback Loop, and Neuroscience
Speakers: Jeffrey C. Hall, PhD, *University of Maine*; Michael Rosbash, PhD, *Brandeis University;* Michael W. Young, PhD, *The Rockefeller University*
Support contributed by The Peter and Patricia Gruber Foundation
Sunday, Oct. 18, 2:30–3:40 p.m.
McCormick Place: Hall B1



Circadian rhythms are widespread among eukaryotes and generate 24-hour oscillations that impact multiple systems: metabolic, physiological, hormonal, and behavioral among others. Molecular genetic work in *Drosophila* over the past 25 years has identified key circadian genes and proteins, which are conserved from flies to man. A key molecular mechanism, a transcriptional feedback loop with ca. 24-hour periodicity, emerged from this work and is conserved. The mechanism functions within key brain pacemaker neurons in flies, mice, and humans to drive circadian rhythms. The lectures describe some early work, as well as the contemporary interface between neuroscience and circadian rhythm research.

Presidential Special Lecture

Brain Systems of Learning and Memory CME
Speaker: Richard G.M. Morris, PhD
University of Edinburgh, United Kingdom
Support contributed by Lundbeck Research USA
Sunday, Oct. 18, 5:15–6:25 p.m.
McCormick Place: Hall B1

Qualitatively distinct brain systems for memory enable us to acquire knowledge, change habits in response to experience, recollect events from the past, and plan for the future. A "Grand Challenge" for neuroscience is to understand the neural mechanisms of the capacity to encode, store, consolidate, and retrieve information.

David Kopf Lecture on Neuroethics

Eyes Wide Open, Brain Wide Shut? (Un)Consciousness in the Vegetative State

Speaker: Steven Laureys, MD, PhD
University of Liege, Belgium
Support contributed by David Kopf Instruments
Monday, Oct. 19, 10–11:10 a.m.
McCormick Place: Hall B1

When some patients awake from their coma, they fail to show any signs of awareness or voluntary behavior (i.e., they are in a vegetative state), or they remain unable to communicate (i.e., they are in a minimally conscious state). Clinical management of these disorders of consciousness is challenging, but technological advances in neuroimaging and EEG-based brain-computer interfaces are now offering new ways to improve diagnostic, prognostic, and therapeutic management. This lecture will discuss recent studies that are heralding a new era of coma and consciousness research.

Special Presentation

The Future of NIH: Advancing Biomedical Research to Benefit Humankind

Speaker: Francis S. Collins, MD, PhD
Director, National Institutes of Health
Monday, Oct. 19, 1–2 p.m.
McCormick Place: Hall B1

As the new Director of the National Institutes of Health (NIH), Francis Collins will guide the world's largest biomedical research organization, and play a major role in the training of a new generation of scientists. In this forum, Collins will discuss his vision for NIH and America's role in the global scientific community. He also will discuss the opportunities and challenges created by historic Recovery Act funding, and how the act created greater recognition of the economic impact of research in addition to demonstrated scientific and health impact. Collins will highlight ways the research community can engage in the scientific and public policy arenas to promote the role of basic, translational, and clinical research to benefit humankind.

Albert and Ellen Grass Lecture

Mental Monitoring of Movement CME

Speaker: Robert H. Wurtz, PhD
National Eye Institute, National Institutes of Health
Support contributed by The Grass Foundation
Monday, Oct. 19, 3:15–5 p.m.
McCormick Place: Hall B1

Our mental activity is not directly observable, but we can infer much about its inner workings by measuring what we perceive and how we move. This lecture opens a window into this internal activity by looking at signals in the brain that simply monitor movements. For eye movements, a monitoring circuit identified in the monkey contributes to the perception of a stable visual world and the control of sequential movements, and indicates how such monitoring might function in other brain systems.

Presidential Special Lecture

Addiction and Self-Control CME

Speaker: Nora D. Volkow, MD
National Institute on Drug Abuse, National Institutes of Health
Support contributed by Johnson & Johnson
Monday, Oct. 19, 5:15–6:25 p.m.
McCormick Place: Hall B1

Addiction involves complex interactions between a wide array of biological and environmental variables. Pairing advanced neuroimaging technologies with sophisticated behavioral measurement paradigms has allowed extraordinary progress in elucidating neurochemical and functional brain changes in addicts. Discovery of disruptions in the fine balance that normally exists between brain circuits underlying reward, motivation, memory, and cognitive control have important implications for designing multi-pronged therapies for treating addictive disorders.

History of Neuroscience Lecture

From Cells to Cajal to Connectome: The Basic Wiring Diagram of the Brain

Speaker: Larry W. Swanson, PhD
University of Southern California
Support contributed by AstraZeneca
Tuesday, Oct. 20, 2:30–3:40 p.m.
McCormick Place: Hall B1

Watson and Crick's structural model of DNA enabled the human genome to be sequenced in just 50 years, accompanied by fundamental insights into the organization of gene networks that construct the embryo and control adult cell biology. Structural models of basic nervous system organization in vertebrates will be reviewed historically, along with strategies to map systematically all nervous system connections with the latest generation of methods. Hopefully, concepts emerging from analyzing genome and connectome data together will revolutionize systems neuroscience.

Presidential Special Lecture

On the Perpetuation of Long-Term Memory CME

Speaker: Eric R. Kandel, MD
Howard Hughes Medical Institute, Columbia University
Support contributed by Merck & Co., Inc.
Tuesday, Oct. 20, 5:15–6:25 p.m.
McCormick Place: Hall B1

Using a set of molecular mechanisms emerging from studies of *Aplysia, Drosophila,* and mice, whereby a stable, self-maintained, long-term memory is achieved, this lecture will focus on the communication between signals from a specific, activated synapse with the nucleus to initiate, maintain, and perpetuate synapse-specific facilitation and growth. Experiments in the mouse, which indicate that the long-term stabilization of the hippocampal place field map requires attention during acquisition, also will be discussed.