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Empirical Approaches to Neuroscience and Society Symposium

002. Statistics and Computation for an Increasingly Quantitative Scientific Future

Theme H: History, Teaching, Public Awareness, and Societal Impacts in Neuroscience

Location: S100A

Time: 10/17/2015 1:30:00 PM - 10/17/2015 4:00:00 PM

The replication of scientific studies is a widely-recognized challenge in neuroscience and requires practical solutions, which can impact research, funding, publishing, and training. Speakers will discuss best practices in experimental design, statistical rigor, impact on animal use, methodological descriptions, reagent validation and sharing, data sharing, and the impact these have on funding and publishing practices. This symposium will also explore the role of inherent scientific biases and how these might be mitigated to achieve higher standards of reproducibility.

Time: Sat. 1:30 PM - 4:00 PM

2. Chair

R. Balice-Gordon;
Neuroscience and Pain Research Unit, Pfizer, Inc., Philadelphia, PA.

Time: Sat. 1:30 PM - 1:35 PM

2.01. Introduction

Time: Sat. 1:35 PM - 2:10 PM

2.02. A Publisher’s Perspective on Reproducibility and Robustness in Science

K. Brose;

Time: Sat. 2:10 PM - 2:45 PM

2.03. Quality Improvement in the Lab: Take Care or Beware

W. J. Koroshetz;
National Institute of Neurological Disorders and Stroke, Bethesda, MD.

Time: Sat. 2:45 PM - 3:20 PM

2.04. Rigor and Rewards: Brain Drain, Brain Circulation, and Professional Movement in Biomedical Research
J. Illes;  
National Core for Neuroethics and Division of Neurology, University of British Columbia,  
Vancouver, BC, CANADA.

**Time:** Sat. 3:20 PM - 3:55 PM

2.05. Statistical Rigor and the Perils of Chance

K. S. Button;  
Department of Psychology, University of Bath, United Kingdom.

**Time:** Sat. 3:55 PM - 4:00 PM

2.06. Closing Remarks

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**Symposium**

**003. How Does the Brain Implement Adaptive Decision Making to Eat?**

Theme C: Disorders of the Nervous System

**Location:** S100B

**Time:** 10/17/2015 1:30:00 PM - 10/17/2015 4:00:00 PM

Adaptive decision-making to eat is crucial for survival, but in anorexia nervosa, the brain persistently supports reduced food intake despite a growing need for energy. How the brain persists in reducing food intake to the point of death despite the evolution of mechanisms to ensure survival by governing adaptive eating behaviors remains just as mysterious as the switch from anorexia to bulimia. Neural substrates belong to the reward-habit system and could differ from overeating-induced obesity.

**Time:** Sat. 1:30 PM - 4:00 PM

3. Chair

V. Compan;  
Neurosciences, Nimes University, CNRS, INSERM, Montpellier, FRANCE.

**Time:** Sat. 1:30 PM - 1:35 PM

3.01. Introduction

**Time:** Sat. 1:35 PM - 2:10 PM

3.02. Neural circuits associated with persistent restrictive food choice in Anorexia Nervosa
B. Walsh;
Clinical Therapeutics, Columbia University/NY State Psychiatric Institute, New York, NY.

Time: Sat. 2:10 PM - 2:45 PM

3.03. Are Extremes of Consumption in Eating Disorders Related to an Altered Balance between Reward and Inhibition?

W. Kaye;
Department of Psychiatry, UCSD, San Diego, CA.

Time: Sat. 2:45 PM - 3:20 PM

3.04. The switch from anorexia to cocaine or food abuse involves the serotonin 4 receptors

V. Compan;
Neurosciences, University, Montpellier, FRANCE.

Time: Sat. 3:20 PM - 3:55 PM

3.05. Amodal brain activation and functional connectivity in response to high-energy-density food cues in obesity

A. Geliebter;
440 W. 114th Street, Mt. Sinai St. Luke's Hospital, New-York, NY.

Time: Sat. 3:55 PM - 4:00 PM

3.06. Closing Remarks

Symposium

004. Dysregulation of Mechanistic Target of Rapamycin Signaling in Mouse Models of Autism

Theme B: Neural Excitability, Synapses, and Glia: Cellular Mechanisms

Location: S406A

Time: 10/17/2015 1:30:00 PM - 10/17/2015 4:00:00 PM

Autism is a widespread disorder characterized by deficits in social interactions, communication, and repetitive/stereotypic behaviors. Despite the wide diversity of genes implicated in autism, they appear to converge on common biological pathways to give rise to autism-relevant behaviors. Ground-breaking discoveries in this area in the past 2-3 years implicate over-activated
mTOR signaling is a major player in impaired synaptic plasticity, neural networks, and behaviors in autism spectrum disorders.

**Time**: Sat. 1:30 PM - 4:00 PM

4. Chair

**R. Zukin**;
Dept Neurosci, Albert Einstein College of Medicine, New York, NY.

**Time**: Sat. 1:30 PM - 1:35 PM

4.01. Introduction

**Time**: Sat. 1:35 PM - 2:10 PM

4.02. Dysregulation of mTOR signaling in mouse models of autism.

**R. Zukin**;
Dept Neurosci, Albert Einstein Col Med, Bronx, NY.

**Time**: Sat. 2:10 PM - 2:45 PM

4.03. Dysregulated Translation in Neurodevelopmental Disorders.

**E. Klann**;
Ctr Neural Sci, New York University, New York, NY.

**Time**: Sat. 2:45 PM - 3:20 PM

4.04. Disrupted Homer scaffolds mediate abnormal signaling to the mTOR pathway in a mouse model of autism.

**K. M. Huber**;
Neuroscience, Univ Texas Southwestern Med Ctr, Dallas, TX.

**Time**: Sat. 3:20 PM - 3:55 PM

4.05. mTOR complexes in autism spectrum disorder

**M. Costa-Mattioli**;
Baylor College of Medicine, HOUSTON, TX.

**Time**: Sat. 3:55 PM - 4:00 PM

4.06. Closing Remarks
Minisymposium

005. Epigenetic Landscape of Stress and Addiction: Novel Therapeutic Possibilities

Theme C: Disorders of the Nervous System

Location:  S105

Time:  10/17/2015 1:30:00 PM - 10/17/2015 4:00:00 PM

At this minisymposium, speakers will describe the transcriptional and epigenetic mechanisms by which stress and drugs of abuse modify the functionality of reward circuitries. They will also discuss how individual and environmental resilience factors may impact these molecular events. Behavioral and pharmacologic approaches that prevent or alter drug- and/or stress-induced epigenetic changes in the brain may promote long-term abstinence by preventing relapse to drug self-administration.

Time:  Sat. 1:30 PM - 4:30 PM

5. Chair

J. Cadet;
Molecular Neuropsychiatry Branch, National Institute on Drug Abuse Intramural Research Program, NIH, Baltimore, MD.

Time:  Sat. 1:30 PM - 4:30 PM

5. Co Chair

E. Binder;
Department of Psychiatry and Behavioral Sciences, Emory University School of Medicine, Atlanta, GA.

Time:  Sat. 1:30 PM - 1:35 PM

5.01. Introduction

Time:  Sat. 1:35 PM - 1:55 PM

5.02. Epigenetic regulation of brain reward circuits

J. Day;
Department of Neurobiology, University of Alabama, Birmingham, AL.

Time:  Sat. 1:55 PM - 2:15 PM

5.03. Stress-induced epigenetic changes in the FKBP5 locus.
E. Binder;
Department of Psychiatry and Behavioral Sciences, Emory University, Atlanta, GA.

**Time:** Sat. 2:15 PM - 2:35 PM

5.04. Transcriptional and epigenetic bases of incubation of methamphetamine craving

J. Cadet;
Molecular Neuropsychiatry Research Branch, NIH/NIDA Intramural Research Program, Baltimore, MD.

**Time:** Sat. 2:35 PM - 2:55 PM

5.05. Transcriptional and epigenetic effects of alcohol exposure

K. Schuebel;
Laboratory of Neurogenetics, NIH/NIAAA Intramural Research Program, Bethesda.

**Time:** Sat. 2:55 PM - 3:15 PM

5.06. The impact of exposure of drugs of abuse on future generations

F. Vassoler;
Department of Biological Sciences, Tufts University, Grafton, MA.

**Time:** Sat. 3:15 PM - 3:35 PM

5.07. Biological resilience to harsh and non-supporting parenting.

S. Jaffee;
Department of Psychology, University of Pennsylvania, Philadelphia, PA.

**Time:** Sat. 3:35 PM - 4:00 PM

5.08. Closing Remarks

**Minisymposium**

**006. Dorsal Striatum: From Microcircuits and Modulation to *In Vivo* Function**

Theme D: Sensory and Motor Systems

**Location:** S103

**Time:** 10/17/2015 1:30:00 PM - 10/17/2015 4:00:00 PM
Dorsal striatum receives sensorimotor and higher-order information through a wide range of synaptic inputs, including those from the cortex and the thalamus. The integration of this information is fine-tuned by neuromodulators affecting cortical and subcortical motor systems. This minisymposium will present data from connected areas of research that aim at understanding the cellular diversity, connectivity, modulation, and \textit{in vivo} function of the dorsal striatal network and how malfunction might lead to disease.

\textbf{Time:} Sat. 1:30 PM - 4:00 PM

6. Chair

\textbf{J. Hjerling-Leffler;}  
MBB, Karolinska Institute, Stockholm, SWEDEN.

\textbf{Time:} Sat. 1:30 PM - 4:00 PM

6. Co Chair

\textbf{D. Robbe;}  
INMED, INMED, Marseille, FRANCE.

\textbf{Time:} Sat. 1:35 PM - 1:55 PM

6.02. Single-cell RNA sequencing reveals striatal neuronal populations

\textbf{J. Hjerling-Leffler;}  
MBB, Karolinska Inst, Stockholm, SWEDEN.

\textbf{Time:} Sat. 1:55 PM - 2:15 PM

6.03. Organization of interneuron systems in the neostriatum

\textbf{T. Koós;}  
Center for Molecular and Behavioral Neuroscience, Rutgers University, Newark, NJ.

\textbf{Time:} Sat. 2:15 PM - 2:35 PM

6.04. Regulators of dopamine transmission in the dorsal striatum

\textbf{S. J. Cragg;}  
Dept Physiology, Anatomy and Genetics, Univ Oxford, Oxford, UNITED KINGDOM.

\textbf{Time:} Sat. 2:35 PM - 2:55 PM

6.05. The dorsolateral striatum multiplexes contextual and movement-related information to constrain execution of motor habits
D. Robbe;  
INMED, INMED, Marseille, FRANCE.

Time: Sat. 2:55 PM - 3:15 PM

6.06. Type-dependent information processing in the rodent striatum

D. Cohen;  
The Gonda Brain Research Center, Bar Ilan University, Ramat-Gan, ISRAEL.

Time: Sat. 3:15 PM - 3:35 PM

6.07. Modeling Tourette syndrome pathophysiology through targeted manipulation of striatal interneurons

C. J. Pittenger;  
Psychiatry, Yale University, NEW HAVEN, CT.

Time: Sat. 1:30 PM - 1:35 PM

6.01. Introduction

Time: Sat. 3:35 PM - 4:00 PM

6.08. Closing Remarks

Minisymposium

007. Axonal Transport Defects in Neurodegenerative Diseases: Mechanisms and Molecular Components Involved

Theme C: Disorders of the Nervous System

Location:  S406B

Time: 10/17/2015 1:30:00 PM - 10/17/2015 4:00:00 PM

To date, there is significant consensus on the notion that deficits in axonal transport represent an important pathogenic event common to many neurodegenerative diseases. However, little is known about mechanisms and specific molecular components mediating these deficits. These topics will be the main subject of discussion at this minisymposium.

Time: Sat. 1:30 PM - 4:00 PM

7. Chair
7.01. Introduction

7.02. Mechanisms mediating deficits in axonal transport of mitochondria in Parkinson’s disease Drosophila models

P. Hollembeck;
Department of Biological Sciences, Purdue University, West Lafayette, IN.

Time: Sat. 1:55 PM - 2:15 PM

7.03. Mechanisms and restoration of BDNF transport defects in Alzheimer's disease

M. A. Silverman;
Dept Biol Sci, Simon Fraser Univ, Burnaby, BC, CANADA.

Time: Sat. 2:15 PM - 2:35 PM

7.04. "Mechanisms mediating axonal transport deficits induced by Alzheimer’s disease-related forms of tau protein"

N. M. Kanaan;
Translational Science & Molecular Medicine, Michigan State University, Grand Rapids, MI.

Time: Sat. 2:35 PM - 2:55 PM

7.05. “RAN-translated c9orf72 peptides promote alterations in axonal transport and synaptic through a kinase-dependent mechanism”.

Y. Song;
Boyer Center for Molecular Medicine, Yale School of Medicine, New Haven, CT.

Time: Sat. 2:55 PM - 3:15 PM
7.06. Inhibition of axonal transport through activation of p38 MAPK by misfolded ALS-linked proteins

**J. E. McKeon:**
University of Massachusetts Medical School, Worcester, MA.

**Time:** Sat. 3:15 PM - 3:35 PM

7.07. "A novel mechanism linking activation of specific MAP kinases to deficits in axonal transport in Huntington’s disease".

**G. Morfini:**
Anatomy and Cell Biology, University of Illinois, Chicago, IL.

**Time:** Sat. 3:35 PM - 4:00 PM

7.08. Closing Remarks

**Symposium**

097. Identifying and Manipulating the Synapses, Cells, and Circuits of Memory Engrams: Implications for Memory and Memory Disorders

Theme F: Cognition and Behavior

**Location:** S100A

**Time:** 10/18/2015 8:30:00 AM - 10/18/2015 11:00:00 AM

Ground-breaking technological developments in neuroscience have transformed efforts to identify, understand, and manipulate the engram at a synaptic, cellular and circuit level. This symposium will review these advances and discuss their implications for the understanding of memory as well as memory disorders.

**Time:** Sun. 8:30 AM - 11:00 AM

097. Chair

**A. J. Silva:**
Neurobiology, University of California-Los Angeles Medical Center, Los Angeles, CA.

**Time:** Sun. 8:30 AM - 8:35 AM

97.01. Introduction

**Time:** Sun. 8:35 AM - 9:10 AM
97.02. Deactivating hippocampal fear memories: implications for psychiatric and memory disorders

C. A. Denny;
Columbia University, New York, NY.

Time: Sun. 9:10 AM - 9:45 AM

97.03. Genetic Control of Memory Circuits

M. Mayford;
The Scripps Res Inst, Inst Childhood & Neglected Dis, La Jolla, CA.

Time: Sun. 9:45 AM - 10:20 AM

97.04. Synaptic, cellular and circuit mechanisms that link contextual memories across time

A. J. Silva;
Neurobiology, University of California-Los Angeles Medical Center, Los Angeles, CA.

Time: Sun. 10:20 AM - 10:55 AM

97.05. Identification and Engineering of Memory Engram Cells

S. Tonegawa;
Dir, Picower Inst. Memory & Learning, Massachusetts Inst Technol, Boston, MA.

Time: Sun. 10:55 AM - 11:00 AM

97.06. Closing Remarks

Symposium

098. Cellular and Circuit Mechanisms of Multisensory Integration and Plasticity

Theme D: Sensory and Motor Systems

Location: S406A

Time: 10/18/2015 8:30:00 AM - 10/18/2015 11:00:00 AM

Multisensory integration occurs even at the early stages of sensory processing across diverse organisms. Such interactions also serve as substrates for cross-modal plasticity in the event of losing a sensory modality. This session will present recent evidence demonstrating synaptic and circuit mechanisms of multisensory interactions and cross-modal plasticity. Mechanisms
underlying the development of multisensory circuits and their adaptive plasticity in adults will be highlighted.

**Time:** Sun. 8:30 AM - 11:00 AM

098. Chair

**H. Lee:**
Neuroscience, Johns Hopkins University, Baltimore, MD.

**Time:** Sun. 8:30 AM - 11:00 AM

098. Co Chair

**P. O. Kanold:**
Biology, University of Maryland, College Park, MD.

**Time:** Sun. 8:30 AM - 8:35 AM

98.01. Introduction

**Time:** Sun. 8:35 AM - 9:10 AM

98.02. Cellular mechanisms underlying temporal tuning of multisensory integration

**C. D. Aizenman:**
Dept Neurosci, Brown Univ, Providence, RI.

**Time:** Sun. 9:10 AM - 9:45 AM

98.03. Cross-modal synaptic plasticity in adult cortex

**H. Lee:**
Neuroscience, Johns Hopkins University, Baltimore, MD.

**Time:** Sun. 9:45 AM - 10:20 AM

98.04. Crossmodal induced refinement of intracortical circuits

**P. O. Kanold:**
Biology, University of Maryland, College Park, MD.

**Time:** Sun. 10:20 AM - 10:55 AM

98.05. Multisensory processing within cortico-cortical and thalamocortical networks: mechanisms, ontogeny and behavioral correlates
Minisymposium

099. Transcriptomic Approaches to Neural Regeneration

Theme C: Disorders of the Nervous System

Location: S105

Time: 10/18/2015 8:30:00 AM - 10/18/2015 11:00:00 AM

Understanding why injured adult central nervous system axons fail to regenerate remains a central challenge of neuroscience research. Recently, the use of high-throughput genetic screening has greatly illuminated the molecular mechanisms governing neuronal regeneration programs. This minisymposium will highlight how transcriptomics approaches have led to the identification of novel regulatory networks and molecular targets that can be successfully manipulated to promote axon regeneration.

Time: Sun. 8:30 AM - 11:00 AM

099. Chair

M. H. Tuszynski;
Department of Neurosciences, University of California, San Diego, La Jolla, CA.

Time: Sun. 8:30 AM - 8:35 AM

99.01. Introduction

Time: Sun. 8:35 AM - 8:55 AM

99.02. A systems-level analysis of the peripheral nerve intrinsic axonal growth program

V. Chandran;
Department of Neurology, University of California - Los Angeles, Los Angeles, CA.

Time: Sun. 8:55 AM - 9:15 AM
99.03. Transcriptome and High Content Analysis reveal coding and non-coding RNAs in sensory neuron plasticity and axon regeneration

J. K. Lerch;
Department of Neuroscience, The Ohio State University College of Medicine, Columbus, OH.

Time: Sun. 9:15 AM - 9:35 AM

99.04. Genome-wide transcriptional changes elicited by peripheral nerve injury

A. Antunes-Martins;
Wolfson Centre for Age-Related Diseases, King's College London, London, UNITED KINGDOM.

Time: Sun. 9:35 AM - 9:55 AM

99.05. cAMP-induced CREB sufficient/AP1-dependent transcriptional programs in axon regeneration

D. E. Willis;
Department of Neuroscience, Burke Medical Research Institute, White Plans, NY.

Time: Sun. 9:55 AM - 10:15 AM

99.06. The role of the activin cascade in CNS axonal growth

M. Costigan;
Anesthesia-Neural Plasticity Res Grp, Children's Hospital Boston, Harvard Medical School, Boston, MA.

Time: Sun. 10:15 AM - 10:35 AM

99.07. "Omics" insights into corticospinal tract regeneration

J. N. Dulin;
Department of Neurosciences, University of California - San Diego, La Jolla, CA.

Time: Sun. 10:35 AM - 11:00 AM

99.08. Closing Remarks

Minisymposium

100. Sex-Specific Mechanisms of Stress Susceptibility
Stress-related mental illnesses are twice as prevalent in women as in men. Because many factors that contribute to pathology are likely sex-dependent, the development of improved treatments for both men and women relies on preclinical studies that include both male and female animals. This minisymposium will highlight recent advances in rodent models that dissect the genes, hormones, and circuits that underpin sex differences in the brain’s response to stress.

**100. Chair**

**D. Bangasser;**  
Psychology, Temple University, Philadelphia, PA.

**100. Co Chair**

**M. R. Farrell;**  
Department of Psychology, Northeastern University, Boston, MA.

**100.01. Introduction**

**Time:** Sun. 8:35 AM - 8:55 AM

100.02. Sex differences in receptors: "Micro" differences with "macro" implications for the treatment of stress-related psychiatric disorders

**D. Bangasser;**  
Psychology, Temple University, Philadelphia, PA.

**Time:** Sun. 8:55 AM - 9:15 AM

100.03. Sex-specific activation of the Nucleus Accumbens transcriptome regulates resilience and susceptibility to variable stress

**G. Hodes;**  
Neuroscience, Mount Sinai School of Medicine, New York, NY.
100.04. Sex differences in susceptibility to an acute or persistent inflammatory challenge

**N. Tronson;**  
Psychology, University of Michigan, Ann Arbor, MI.

**Time:** Sun. 9:35 AM - 9:55 AM

100.05. Sex differences in the Melanocortin-5 receptor control of emotional behaviors in mice

**C. Morgan;**  
Nutrition and Food Science, Texas A&M University, College Station, TX.

**Time:** Sun. 9:55 AM - 10:15 AM

100.06. Kappa opioid receptors and social stress in males and females

**B. Trainor;**  
Psychology, University of California at Davis, Davis, CA.

**Time:** Sun. 10:15 AM - 10:35 AM

100.07. A sex-dependent role for the mesocortical dopamine pathway in learned fear expression and suppression

**M. R. Farrell;**  
Department of Psychology, Northeastern University, Boston, MA.

**Time:** Sun. 10:35 AM - 11:00 AM

100.08. Closing Remarks

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**Minisymposium**

101. **Learning to Generalize: Neural, Behavioral, and Computational Basis of Categorization**

Theme F: Cognition and Behavior

**Location:** S406B

**Time:** 10/18/2015 8:30:00 AM - 10/18/2015 11:00:00 AM

The ability to group objects and events into flexible categories depending on their behavioral utility is fundamental to many forms of intelligent behavior shared between human and nonhuman primates. This minisymposium will synthesize alternative views of how the brain
implements categorization based on studies of statistical learning in humans, lesions in monkeys, the activity of single neurons and dynamics of cortical networks in monkeys, as well as the properties of computational models.

**Time:** Sun. 8:30 AM - 11:00 AM

101. Chair

**M. V. Chafee:**
Dept Neuroscience, University of Minnesota, Minneapolis, MN.

**Time:** Sun. 8:30 AM - 11:00 AM

101. Co Chair

**H. Merchant:**
Cognitive and Behavioral Neuroscience, Instituto de Neurobiologia UNAM, Queretaro, Queretaro, MEXICO.

**Time:** Sun. 8:30 AM - 8:35 AM

101.01. Introduction

**Time:** Sun. 8:35 AM - 8:55 AM

101.02. Relative and absolute representation of temporal and spatial categories in the primate pre-SMA.

**H. Merchant:**
Cognitive and Behavioral Neuroscience, Instituto de Neurobiologia UNAM, Queretaro, Queretaro, MEXICO.

**Time:** Sun. 8:55 AM - 9:15 AM

101.03. Executive control of categorization in the prefrontal-parietal network

**M. V. Chafee:**
Neuroscience, Univ Minnesota, Minneapolis, MN.

**Time:** Sun. 9:15 AM - 9:35 AM

101.04. Categorization: The roles of prefrontal and temporal

**M. A. Eldridge:**
Laboratory of Neuropsychology, NIMH, Bethesda, MD.

**Time:** Sun. 9:35 AM - 9:55 AM
101.05. Neural circuit basis of category learning in the prefrontal cortex and striatum

**E. K. Miller;**
Brain and Cognitive Sciences, Massachusetts Inst Technol, Cambridge, MA.

**Time:** Sun. 9:55 AM - 10:15 AM

101.06. Incidental auditory category learning.

**L. L. Holt;**
Psychology, Carnegie Mellon University, Pittsburgh, PA.

**Time:** Sun. 10:15 AM - 10:35 AM

101.07. Neural mechanisms of category learning: a tale of two approaches

**X. Wang;**
Center for Neural Science, New York University, New York, NY.

**Time:** Sun. 10:35 AM - 11:00 AM

101.08. Closing Remarks

**Symposium**

185. **Human iPSC Derived Cells for Modeling Neurodegenerative Disease and Drug Discovery**

Theme C: Disorders of the Nervous System

**Location:** S100A

**Time:** 10/18/2015 1:30:00 PM - 10/18/2015 4:00:00 PM

Human induced pluripotent stem cells (iPSCs) provide unprecedented access to neurons and glia to study neurodegenerative disorders. For the first time, researchers have sufficient human material, derived from specific patient populations, to perform studies in the cell types of interest. This symposium will highlight research that demonstrates the broad utility of iPSC technology in developing better tools, models, and biomarkers for innate, induced, and infectious neurodegenerative disorders.

**Time:** Sun. 1:30 PM - 4:00 PM

185. Chair
E. M. Jones;
Strategic Alliances, Cellular Dynamics International, Madison, WI.

**Time:** Sun. 1:30 PM - 4:00 PM

185. Co Chair

E. Chiao;
Translational Sciences, Biogen IDEC, Boston, MA.

**Time:** Sun. 1:30 PM - 1:35 PM

185.01. Introduction

**Time:** Sun. 1:35 PM - 2:10 PM

185.02. Human iPSC derived cells for modeling neurodegenerative disease and drug discovery.

E. Chiao;
Translational Sciences, Biogen IDEC, Boston, MA.

**Time:** Sun. 2:10 PM - 2:45 PM

185.03. Generating patient-specific iPSCs-derived neurons to explore formation and inhibition of human prions

W. Zou;
Pathology, Case Western Reserve University, Cleveland, OH.

**Time:** Sun. 2:45 PM - 3:20 PM

185.04. Promise and challenges of iPSC modeling in Parkinson’s disease

B. Schuele;
Gene Discovery and Stem Cell Modeling, Parkinson's Institute and Clinical Center, Sunnyvale, CA.

**Time:** Sun. 3:20 PM - 3:55 PM

185.05. Use of stem cell derived neurons in studies of chemotherapy induced neuropathy

E. Dolan;
Dept of Medicine, University of Chicago, Chicago, IL.

**Time:** Sun. 3:55 PM - 4:00 PM

185.06. Closing Remarks
Symposium

186. Hidden Variables of Behavior: Neuronal Parameters Underlying Brain States

Theme F: Cognition and Behavior

Location: S100B

Time: 10/18/2015 1:30:00 PM - 10/18/2015 4:00:00 PM

Technologies for observing and influencing large-scale neural circuit dynamics have illuminated how time-varying brain states shape vertebrate cognition and behavior. Highlighting recent work on spatial, emotional, and social forms of cognition, speakers will discuss factors acting over time scales of seconds to years — including neurophysiological dynamics, life experience, and epigenetics — to sculpt the internal dynamics and interactions of brain systems underlying brain and behavioral states.

Time: Sun. 1:30 PM - 4:00 PM

186. Chair

M. J. Schnitzer;

Time: Sun. 1:30 PM - 1:35 PM

186.01. Introduction

Time: Sun. 1:35 PM - 2:10 PM

186.02. Neural control of parental behaviors

C. G. Dulac;
Dept Molec & Cell Biol, Harvard Univ, Cambridge, MA.

Time: Sun. 2:10 PM - 2:45 PM

186.03. Large-scale neural dynamics in states of environmental exploration versus those of learned exploitation

M. J. Schnitzer;

Time: Sun. 2:45 PM - 3:20 PM

186.04. Fast modulation of visual perception by basal forebrain cholinergic neurons
Y. Dan;
Molecular and Cell Biology, UC Berkeley, Berkeley, CA.

Time: Sun. 3:20 PM - 3:55 PM

186.05. Coordination of entorhinal-hippocampal ensemble activity during navigation behaviors

L. M. Frank;
Department of Physiology, UC San Francisco, San Francisco, CA.

Time: Sun. 3:55 PM - 4:00 PM

186.06. Closing Remarks

Symposium

187. New Frontiers in Understanding Glia

Theme B: Neural Excitability, Synapses, and Glia: Cellular Mechanisms

Location: S105

Time: 10/18/2015 1:30:00 PM - 10/18/2015 4:00:00 PM

More than half of the cells in the mammalian nervous system are glia. Long thought to play a largely supportive role to neurons, exciting work in the past few years has overwhelmingly overturned this notion. This symposium will provide a cutting-edge view of our rapidly expanding understanding of the development and functions of glia: how they myelinate axons, control synapse formation and elimination, respond to neuronal injury, and their contribution to neurodegenerative disease.

Time: Sun. 1:30 PM - 4:00 PM

187. Chair

B. A. Barres;
Neurobiology, Stanford University, Stanford, CA.

Time: Sun. 1:30 PM - 1:35 PM

187.01. Introduction

Time: Sun. 1:35 PM - 2:10 PM

187.02. Elucidation of the mechanism of myelin wrapping by oligodendrocytes
B. A. Barres;
Neurobiology, Stanford University, Stanford, CA.

**Time:** Sun. 2:10 PM - 2:45 PM

187.03. *Drosophila* as a genetic model system for understanding astrocyte development and function

M. R. Freeman;
Department of Neurobiology, HHMI, University of Massachusetts Medical School/HHMI, Worcester, MA.

**Time:** Sun. 2:45 PM - 3:20 PM

187.04. Control of PNS regeneration by Schwann cells

A. C. Lloyd;
MRC Laboratory for Molecular Cell Biology, University College London, London, UNITED KINGDOM.

**Time:** Sun. 3:20 PM - 3:55 PM

187.05. A novel role for microglia in brain wiring and unwiring

D. Schafer;
Neurology, University of Massachusetts Medical School, Worcester, MA.

**Time:** Sun. 3:55 PM - 4:00 PM

187.06. Closing Remarks

**Minisymposium**

**188. Behavior Diversity in Individuals: Genetic and Circuit Mechanisms**

Theme D: Sensory and Motor Systems

**Location:** S406A

**Time:** 10/18/2015 1:30:00 PM - 10/18/2015 4:00:00 PM

Consistent differences in sensorimotor behavior are found among individuals. These differences likely contribute to fitness in varied environmental conditions. However, the proximal causes that generate and control behavior variability have only recently begun to be unraveled. This minisymposium will examine mechanisms of behavior variability in vertebrates and
invertebrates. Presentations will include the latest findings from genetic, molecular, and circuit-based studies.

**Time:** Sun. 1:30 PM - 4:00 PM

188. Chair

**B. Grone:**  
University of California, San Francisco, Menlo Park, CA.

**Time:** Sun. 1:30 PM - 4:00 PM

188. Co Chair

**C. J. Pantoja:**  
Department of Molecular & Cell Biology, University of California, Berkeley, Berkeley, CA.

**Time:** Sun. 1:30 PM - 1:35 PM

188.01. Introduction

**Time:** Sun. 1:35 PM - 1:55 PM

188.02. Neurobiological and genetic regulation of locomotor individuality

**B. de Bivort:**  
Organismic and Evolutionary Biology, Harvard University, Cambridge, MA.

**Time:** Sun. 1:55 PM - 2:15 PM

188.03. Neuromodulatory control of inter-individual variation in vertebrate startle behavior

**C. Pantoja:**  
Molecular and Cell Biology, University of California, Berkeley, Berkeley, CA.

**Time:** Sun. 2:15 PM - 2:35 PM

188.04. Multigenic natural variation underlies olfactory behavior in Caenorhabditis elegans

**E. Glater:**  
Neuroscience, Pomona College, Claremont, CA.

**Time:** Sun. 2:35 PM - 2:55 PM

188.05. The genetic basis of parental behavior evolution in Peromyscus mice

**A. Bendesky:**  
Organismic and Evolutionary Biology, Harvard University, Cambridge, MA.
188.06. Fathering as a source of individual variation in sensory and motor systems in sticklebacks

**A. Bell;**
Department of Animal Biology, The University of Illinois, Urbana-Champaign, Urbana-Champaign, IL.

**Time:** Sun. 2:55 PM - 3:15 PM

188.07. Evolution of sensory systems following whole-genome duplications

**B. Grone;**
Department of Neurological Surgery, University of California, San Francisco, San Francisco, CA.

**Time:** Sun. 3:15 PM - 3:35 PM

188.08. Closing Remarks

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**Minisymposium**

189. **Genomic Views of Transcriptional Enhancers: Essential Determinants of Cellular Identity and Activity-Dependent Responses in Neurons**

**Theme A: Development**

**Location:** S103

**Time:** 10/18/2015 1:30:00 PM - 10/18/2015 4:00:00 PM

Animal genomes endow nervous systems with an incredible diversity of cell types. Each cell type is defined by a unique gene expression profile that is specified by regulatory sequences sprinkled throughout the genome. It is now possible to identify thousands of these regulatory sequences, called enhancers, in a single experiment and address their neurobiological functions via genome editing. This session will address the scientific opportunities that enhancers now represent for neuroscience.

**Time:** Sun. 1:30 PM - 4:00 PM

189. Chair

**J. M. Gray;**
Genetics, Harvard Medical School, Boston, MA.
**189. Co Chair**

**T. Kim:**
Neuroscience, University of Texas Southwestern Medical Center, Dallas, TX.

**Time:** Sun. 1:30 PM - 1:35 PM

189.01. Introduction

**T. Kim:**
Neuroscience, University of Texas Southwestern Medical Center, Dallas, TX.

**Time:** Sun. 1:35 PM - 1:55 PM

189.02. Stimulus-specific functionality of neuronal enhancers

**Time:** Sun. 1:55 PM - 2:15 PM

189.03. Chromatin regulation of neuronal differentiation in the developing cerebellum

**A. E. West:**
Neurobiol, Duke Univ Med Ctr, Durham, NC.

**Time:** Sun. 2:15 PM - 2:35 PM

189.04. Genomic wiring of transcription regulation in the developing basal ganglia

**A. Nord:**
Center for Neuroscience, UC Davis, Davis, CA.

**Time:** Sun. 2:35 PM - 2:55 PM

189.05. Cortical enhancers and autism

**E. Markenscoff-Papadimitriou:**
Psychiatry (Matthew State lab), UCSF, San Francisco, CA.

**Time:** Sun. 2:55 PM - 3:15 PM

189.06. Enhancer interaction networks as regulators of neuronal diversity

**S. Lomvardas:**
Biochemistry and Molecular Biophysics, Columbia University, New York, NY.

**Time:** Sun. 3:15 PM - 3:35 PM
189.07. Strong promoter activity is encoded independently of enhancer activity by GC/CpG-rich nucleotide sequences

**J. Gray;**
Genetics, Harvard Medical School, Boston, MA.

**Time:** Sun. 3:35 PM - 4:00 PM

189.08. Closing Remarks

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**Minisymposium**

**190. Corticotropin Releasing Factor: Novel Molecular, Cellular, and System Roles**

Theme E: Integrative Systems: Neuroendocrinology, Neuroimmunology, and Homeostatic Challenge

**Location:** S406B

**Time:** 10/18/2015 1:30:00 PM - 10/18/2015 4:00:00 PM

Corticotropin releasing factor (CRF) is a neuropeptide that has classically been studied in the context of neuroendocrine regulation of the stress response. This minisymposium will capitalize on recent data generated by using transgenic, live imaging, electrophysiology, optogenetic, molecular, and behavioral approaches. It will highlight newly appreciated roles of CRF in modulating functions of specific neuronal populations and circuits, influencing memory, anxiety, alcohol intake, and pain.

**Time:** Sun. 1:30 PM - 4:00 PM

190. Chair

**D. G. Winder;**
Vanderbilt University School of Medicine, Nashville, TN.

**Time:** Sun. 1:30 PM - 4:00 PM

190. Co Chair

**N. W. Gilpin;**
Louisiana State University Health Sciences Center, New Orleans, LA.

**Time:** Sun. 1:30 PM - 1:35 PM

190.01. Introduction
Time: Sun. 1:35 PM - 1:55 PM

190.02. CRH neurons as multimodal controllers of the stress response

**J. S. Bains;**
Physio & Biophysics, Hotchkiss Brain Institute, Univ of Calgary, Calgary, AB, CANADA.

Time: Sun. 1:55 PM - 2:15 PM

190.03. CRH interacts with the endocannabinoid system to regulate anxiety

**J. Gray;**
Neuroscience, Hotchkiss Brain Institute, Univ Calgary, Calgary, AB, CANADA.

Time: Sun. 2:15 PM - 2:35 PM

190.04. Amygdalar CRF mediates stress effects on nociception and alcohol drinking

**N. W. Gilpin;**
Physiology, Louisiana State University, New Orleans, LA.

Time: Sun. 2:35 PM - 2:55 PM

190.05. Stress and alcohol recruit a CRF receptor signaling system within the extended amygdala

**D. G. Winder;**
Dept Mol Physiol & Biophysics, Vanderbilt Univ Sch Med, Nashville, TN.

Time: Sun. 2:55 PM - 3:15 PM

190.06. The dark side within: VTA CRF neurons mediate the negative reinforcing effects of relief from nicotine abstinence

**O. George;**
CNAD, Scripps Resch Inst, LA JOLLA, CA.

Time: Sun. 3:15 PM - 3:35 PM

190.07. Elucidating the actions of corticotropin releasing hormone in the nucleus accumbens

**J. C. Lemos;**
Laboratory for Integrative Neuroscience, NIAAA/NIH, Rockville, MD.

Time: Sun. 3:35 PM - 4:00 PM

190.08. Closing Remarks
Symposium

270. Early Reports from the BRAIN Initiative Frontline: Advancing Technologies to Accelerate Our Understanding of Brain Function

Theme G: Novel Methods and Technology Development

Location: S100A

Time: 10/19/2015 8:30:00 AM - 10/19/2015 11:00:00 AM

The BRAIN Initiative was launched in 2013 to stimulate research in key areas of technology development, analysis, and big data research that will accelerate our understanding of brain function. The first funded BRAIN Initiative projects are creating new avenues to understand brain cell diversity, in vivo function and connectivity. Based across a variety of organisms, this symposium will present some of the preliminary news from the first round of BRAIN-funded projects.

Time: Mon. 8:30 AM - 11:00 AM

270. Chair

E. E. Marder:
Biology, The Volen National Center for Complex Systems, Brandeis University, Boston, MA.

Time: Mon. 8:30 AM - 11:00 AM

270. Co Chair

J. I. Roskams:
Allen Institute for Brain Science, Allen Institute, Seattle, WA.

Time: Mon. 8:30 AM - 8:35 AM

270.01. Introduction

Time: Mon. 8:35 AM - 9:10 AM

270.02. Nonlinear optical imaging of mouse brain structure and function

C. Xu:
School of Applied and Engineering Physics, Cornell University, Ithaca, NY.

Time: Mon. 9:10 AM - 9:45 AM

270.03. Noninvasive functional brain imaging at the molecular level
A. Jasanoff;
Brain and Cognitive Science and Nuclear Engineering, MIT, Boston, MA.

Time: Mon. 9:45 AM - 10:20 AM

270.04. High density recording and stimulating electrodes

T. J. Gardner;
Brain & Cognitive Sci, MIT, Boston, WA.

Time: Mon. 10:20 AM - 10:55 AM

270.05. Establishing a comprehensive and standardized cell type characterization platform

H. Zeng;
Research Science, Allen Institute for Brain Science, Seattle, WA.

Time: Mon. 10:55 AM - 11:00 AM

270.06. Closing Remarks

Symposium

271. Retinal Microcircuits for the Computation of Motion Direction: Functional Organization, Development, and Behavior

Theme D: Sensory and Motor Systems

Location: S100B

Time: 10/19/2015 8:30:00 AM - 10/19/2015 11:00:00 AM

The retina has historically been a region of the mammalian central nervous system that is especially tractable. Two-photon imaging, serial electron microscopy, and genetic manipulations of specific cell types are revealing with unprecedented precision how the microcircuity is functionally organized, emerges during development, and contributes to visually-guided behaviors. This symposium will survey recent progress using the example of retinal direction selectivity.

Time: Mon. 8:30 AM - 11:00 AM

271. Chair

H. Seung;
Princeton Neuroscience Institute, Princeton University, Princeton, NJ.
**271.01. Introduction**

Time: Mon. 8:30 AM - 8:35 AM

**271.02. Bipolar cell contributions to retinal motion detection: spatio-temporal organization**

**T. Euler;**
Centre for Integrative Neuroscience (CIN), University of Tübingen, Tübingen, GERMANY.

Time: Mon. 8:35 AM - 9:10 AM

**271.03. Space-time wiring specificity supports direction selectivity in the retina**

**H. Seung;**
Princeton Neuroscience Institute, Princeton University, Princeton, NJ.

Time: Mon. 9:10 AM - 9:45 AM

**271.04. Development of retinal microcircuits for direction selectivity**

**M. B. Feller;**
Department of Molecular and Cell Biology & Helen Wills Neuroscience Institute, University of California, Berkeley, Berkeley, CA.

Time: Mon. 9:45 AM - 10:20 AM

**271.05. Parallel motion pathways from retina to brain**

**A. Huberman;**
Neurosciences, Neurobiology and Ophthalmology, University of California, San Diego, La Jolla, CA.

Time: Mon. 10:20 AM - 10:55 AM

**271.06. Closing Remarks**

Minisymposium

**272. Chaperones in Neurodegeneration**

Theme C: Disorders of the Nervous System

Location: S406A

Time: 10/19/2015 8:30:00 AM - 10/19/2015 11:00:00 AM
This minisymposium will present new work in the area of neuronal proteostasis with a specific focus on the involvement of cellular chaperones in neurodegenerative disease. There will be a brief discussion of protein misfolding in neurodegenerative disease. Then each speaker will present work on a different aspect of chaperone control of neuronal proteostasis with topics including chaperone engineering, blockade of protein oligomerization and cytotoxicity, as well as the rescue of neurodegenerative processes.

**Time:** Mon. 8:30 AM - 11:00 AM

272. Chair

**I. Lindberg:**
Dept Anatomy and Neurobiology, University of Maryland-Baltimore, Baltimore, MD.

**Time:** Mon. 8:30 AM - 8:35 AM

272.01. Introduction

**J. Shorter:**
Department of Biochemistry & Biophysics, University of Pennsylvania, Philadelphia, PA.

**Time:** Mon. 8:35 AM - 8:55 AM

272.02. Protein disaggregases to counter neurodegeneration

**R. L. Wiseman:**
Department of Molecular and Experimental Medicine, The Scripps Research Institute, La Jolla, CA.

**Time:** Mon. 9:15 AM - 9:35 AM

272.03. Regulating extracellular proteostasis through the unfolded protein response

**F. Chiti:**
Section of Biochemistry, Department of Experimental and Clinical Biomedical Sciences, University of Florence, Florence, ITALY.

**Time:** Mon. 9:35 AM - 9:55 AM

272.04. Chaperones are able to bind to and suppress toxicity of pre-formed protein oligomers

272.05. The neuronal secretory chaperones 7B2 and proSAAS suppress the aggregation of neurodegenerative disease-related proteins.
I. Lindberg; 
Dept Anatomy and Neurobiology, University of Maryland- Baltimore, Baltimore, MD.

Time: Mon. 9:55 AM - 10:15 AM

272.06. Controlling tau aggregation and toxicity with Hsp90 chaperone complexes

C. A. Dickey; 
Dept Pharmacol, Univ South Florida, Tampa, FL.

Time: Mon. 10:15 AM - 10:35 AM

272.07. Hsp90 inhibitors as potential therapeutics for Parkinson’s disease and related synucleinopathies.

P. J. McLean; 
Neuroscience, Mayo Clinic Jacksonville, Jacksonville, FL.

Time: Mon. 10:35 AM - 11:00 AM

272.08. Closing Remarks

Minisymposium

273. New Insights into Signal Generation at the Presynaptic Active Zone

Theme B: Neural Excitability, Synapses, and Glia: Cellular Mechanisms

Location: S105

Time: 10/19/2015 8:30:00 AM - 10/19/2015 11:00:00 AM

The presynaptic active zone is the site of Ca^{2+} channels localization, synaptic vesicle docking, and neurotransmitter release. Recent findings shed new light on the topography of the presynaptic active zone and on the molecular mechanisms underlying its function and plasticity in response to neural activity and pathology. This minisymposium will provide a panel of discussion of recent advances in the molecular organization of the presynaptic active zone at central and peripheral synapses.

Time: Mon. 8:30 AM - 11:00 AM

273. Chair

A. Scimemi; 
Biology, SUNY Albany, Albany, NY.
273. Co Chair

**J. S. Dittman;**
Dept Biochem, Weill Cornell Med Col, NEW YORK, NY.

**Time:** Mon. 8:30 AM - 11:00 AM

**273.01. Introduction**

**Time:** Mon. 8:30 AM - 8:35 AM

273.02. Influence of nanoscale channel -vesicle topography on fast synaptic transmission

**D. A. DiGregorio;**
Department of Neuroscience, Institut Pasteur, Paris, FRANCE.

**Time:** Mon. 8:35 AM - 8:55 AM

273.03. Tuning of voltage-gated calcium channel recruitment to the presynaptic release sites

**A. Fejtova;**
RG Presynaptic Plasticity, Leibniz Institute for Neurobiology, Magdeburg, GERMANY.

**Time:** Mon. 8:55 AM - 9:15 AM

273.04. Otoferlin, a C2-domain protein with multiple functions at the hair cell active zone

**J. Neef;**
InnerEarLab / HNO-Klinik, University Medical Center Goettingen, Goettingen, GERMANY.

**Time:** Mon. 9:15 AM - 9:35 AM

273.05. Synaptic vesicles position complexin to inhibit spontaneous fusion

**R. T. Wragg;**
Biochemistry, Weill Cornell Medical College, New York, NY.

**Time:** Mon. 9:35 AM - 9:55 AM

273.06. Homeostatic tuning of presynaptic protein degradation and neurotransmitter release

**M. Mueller;**
Institute of Molecular Life Sciences, University of Zurich, Zurich, SWITZERLAND.

**Time:** Mon. 10:15 AM - 10:35 AM
273.07. Synaptic and extrasynaptic functions of a molecular co-chaperone

R. Fernandez-Chacon;
Medical Physiology & Biophysics, University of Seville, Seville, SPAIN.

Time: Mon. 10:35 AM - 11:00 AM

273.08. Closing Remarks

Minisymposium

274. Can We Merge the Divergent Views of Hippocampal Function?

Theme F: Cognition and Behavior

Location: S103

Time: 10/19/2015 8:30:00 AM - 10/19/2015 11:00:00 AM

Two views diverge in hippocampal research. Some argue that the hippocampus calculates paths through space, whereas others claim that the hippocampus mediates declarative memory. These views emerged largely through independent fields of research. How can researchers reconcile the spatial and memory views of hippocampal function? The goal of this minisymposium is to discuss novel findings that might provide a bridging framework, paving the way for a unified understanding of hippocampal function.

Time: Mon. 8:30 AM - 11:00 AM

274. Chair

D. Schiller;
Psychiatry and Neuroscience, Icahn School of Medicine at Mount Sinai, New York, NY.

Time: Mon. 8:30 AM - 11:00 AM

274. Co Chair

H. B. Eichenbaum;
Dept Psychol, Boston University, Boston, MA.

Time: Mon. 8:30 AM - 8:35 AM

274.01. Introduction

Time: Mon. 8:35 AM - 8:55 AM

274.02. Hippocampal Ensembles Reflect Memory for Spatial Experience
D. Foster;
Department of Neuroscience, Johns Hopkins University School of Medicine, Baltimore, MD.

**Time:** Mon. 8:55 AM - 9:15 AM

274.03. Spatial and Memory Circuits in Hippocampus and Medial Entorhinal Cortex

S. Leutgeb;
Division of Biological Sciences, University of California, San Diego.

**Time:** Mon. 9:15 AM - 9:35 AM

274.04. Using virtual reality to investigate spatial memory in the nonhuman primate

E. Buffalo;
Department of Physiology and Biophysics, Washington National Primate Research Center, Seattle.

**Time:** Mon. 9:35 AM - 9:55 AM

274.05. The Human Hippocampus: A Special Place for Time and Space

C. Ranganath;
Center for Neuroscience, UC Davis, Davis.

**Time:** Mon. 9:55 AM - 10:15 AM

274.06. The Role of Hippocampus in Temporal Memory

L. Davachi;
Department of Psychology, NYU, New York.

**Time:** Mon. 10:15 AM - 10:35 AM

274.07. A Map for Social Navigation in the Human Brain

D. Schiller;
Psychiatry and Neuroscience, Icahn School of Medicine at Mount Sinai, New York.

**Time:** Mon. 10:35 AM - 11:00 AM

274.08. Closing Remarks

**Minisymposium**

275. Internally and Memory-Guided Behaviors: The Role of Frontal Cortical Ensembles
Organized behavior is influenced by internal representations of the external world. How mental models constructed from memory, rules, and timing influence cortical dynamics remains unclear. In this minisymposium, presenters will highlight recent studies of the frontal cortex that have leveraged large-scale recording methods and novel tasks for rodents. These studies are revealing critical roles for cortical oscillations and ensemble activity in mediating internally guided behaviors that could have relevance in understanding brain disease.

**Time:** Mon. 8:30 AM - 11:00 AM

275. Chair

**N. Narayanan;**
Neurology, University of Iowa, Iowa City, IA.

**Time:** Mon. 8:30 AM - 11:00 AM

275. Co Chair

**A. C. Kwan;**
Psychiatry, Yale University School of Medicine, New Haven, CT.

**Time:** Mon. 8:30 AM - 8:35 AM

275.01. Introduction

**Time:** Mon. 8:35 AM - 8:55 AM

275.02. Dynamical function of medial prefrontal cortex in working memory

**C. Li;**
Neuroscience, Shanghai Institute of Neuroscience, Shanghai, CHINA.

**Time:** Mon. 8:55 AM - 9:15 AM

275.03. Representation of internal models by rodent mPFC neuronal ensembles

**A. Y. Karpova;**
Dept Neurobiol, Janelia Farms, 19700 Helix Drive, MD.

**Time:** Mon. 9:15 AM - 9:35 AM
275.04. Distinct roles of visual, parietal, and frontal motor cortices in a memory-guided sensorimotor decision

**M. Goard**;
Neuroscience, MIT, Cambridge, MA.

**Time**: Mon. 9:35 AM - 9:55 AM

275.05. Prefrontal 4 Hz oscillations guide the temporal control of action

**K. Parker**;
Neurology, University of Iowa, Iowa City, IA.

**Time**: Mon. 9:55 AM - 10:15 AM

275.06. Selectivity versus flexibility in frontal cortex representations

**J. Seamans**;
Psychiatry, University of British Columbia, Vancouver, BC, CANADA.

**Time**: Mon. 10:15 AM - 10:35 AM

275.07. Frontal cortical dynamics during adaptive choice behavior

**A. Kwan**;
Psychiatry, Yale University Medical School, New Haven, CT.

**Time**: Mon. 10:35 AM - 11:00 AM

275.08. Closing Remarks

**Symposium**

**360. Understanding Neural Circuits through Dendrite Development and Function**

Theme A: Development

**Location**: S100A

**Time**: 10/19/2015 1:30:00 PM - 10/19/2015 4:00:00 PM

The complex and diverse dendritic arbors have long been recognized as a critical feature of distinct neuronal cell types. The molecular knowledge on dendrite development and cell biology is critical for our understanding of neural circuit assembly and function. In this symposium, speakers will feature several major experimental systems for dendrite research and discuss key results on development, unique cell biology, and how dendrites shape intact neural circuits.
Time: Mon. 1:30 PM - 4:00 PM

360. Chair

K. Shen;
Biology, Howard Hughes Medical Institute, Stanford University, Stanford, CA.

Time: Mon. 1:30 PM - 4:00 PM

360. Co Chair

J. R. Sanes;
MCB, Harvard University, Cambridge, MA.

Time: Mon. 1:30 PM - 1:35 PM

360.01. Introduction

Time: Mon. 1:35 PM - 2:10 PM

360.02. Control of dendrite morphogenesis: from form to function

Y. Jan;
Dept Physiol, Univ California, San Francisco, CA.

Time: Mon. 2:10 PM - 2:45 PM

360.03. Morphogenesis of retinal dendrites: function follows form

J. R. Sanes;
MCB, Harvard University, Cambridge, MA.

Time: Mon. 2:45 PM - 3:20 PM

360.04. The central dogma de-centralized: local translation in dendrites.

E. M. Schuman;
Schuman, Max Planck Institute for Brain Research, Frankfurt, GERMANY.

Time: Mon. 3:20 PM - 3:55 PM

360.05. Cell Recognition and the Assembly of Neural Circuits

S. L. Zipursky;
Biological Chemistry, HHMI/UCLA, Los Angeles, CA.

Time: Mon. 3:55 PM - 4:00 PM
Symposium

361. Rethinking Dogma in Thalamocortical Epilepsies

Theme C: Disorders of the Nervous System

Location:  S100B

Time:  10/19/2015 1:30:00 PM - 10/19/2015 4:00:00 PM

Generalized absence epilepsy has a unique EEG expression and behavioral correlate characterized by 3 Hz spike and wave discharge and a behavioral absence. The thalamocortical circuit is implicated in absence epilepsy, yet roles for thalamus vs neocortex remain controversial, as do roles of different regulators of thalamocortical activity such as calcium channels and GABA receptors. This symposium will present several unexpected findings that challenge existing dogma and provide a state of the art update.

Time:  Mon. 1:30 PM - 4:00 PM

361. Chair

J. R. Huguenard;
Dept Neurol & Neurol Sci, Stanford University School of Medicine, Stanford, CA.

Time:  Mon. 1:30 PM - 4:00 PM

361. Co Chair

H. Shin;
Center for Cognition and Sociality, Institute for Basic Science, Daejeon, KOREA, REPUBLIC OF.

Time:  Mon. 1:30 PM - 1:35 PM

361.01. Introduction

Time:  Mon. 1:35 PM - 2:10 PM


E. Rossignol;
Pediatric Neurology, University of Montreal, Montreal, CANADA.
361.03. Burst firing in thalamic reticular neurons is NOT required for absence seizures

H. Shin;
Center for Cognition and Sociality, Korea Inst Scsi & Tech, Seoul, KOREA, REPUBLIC OF.

361.04. GABAa-ergic synaptic mechanisms regulating output of thalamic inhibitory neurons

A. Luthi;
Dept Pharmacol Neurobiol, Biozentrum, Univ of Basel, Basel, SWITZERLAND.

361.05. Novel roles for thalamus in seizures subsequent to cortical injuries: comparison to genetic epilepsies

J. R. Huguenard;
Dept Neurol & Neurol Sci, Stanford Univ Sch Med, Stanford, CA.

361.06. Closing Remarks

 Symposium

362. Advanced Molecular Imaging of Synapses in Health and Disease

Theme B: Neural Excitability, Synapses, and Glia: Cellular Mechanisms

Location:  S406A

Time:  10/19/2015 1:30:00 PM - 10/19/2015 4:00:00 PM

This symposium will present new developments in imaging and proteomic technology and discuss how they are changing the way researchers characterize synaptic function and dysfunction. Presentations will reveal new insights from multiple scales of synaptic observation including nanoscale super-resolution imaging, time lapse in vivo imaging, and proximity tagging of endogenous proteins for mass spectrometric identification. From molecular screening to disease risk genes, speakers will propose new ways to understand disorders that alter neural circuit performance by disrupting synapses.

Time:  Mon. 1:30 PM - 4:00 PM
362. Chair

T. A. Blanpied;
Physiology, University of Maryland School of Medicine, Baltimore, MD.

Time: Mon. 1:30 PM - 4:00 PM

362. Co Chair

S. Okabe;
Anat & Cell Biol, Tokyo Medical and Dental University, Tokyo, JAPAN.

Time: Mon. 1:35 PM - 2:10 PM

362.02. Spatially-resolved proteomic mapping of synaptic subdomains in living neurons

A. Y. Ting;
Chemistry, MIT, Cambridge, MA.

Time: Mon. 2:10 PM - 2:45 PM

362.03. Nanoscale functional organization and transcellular alignment of single synapses

T. A. Blanpied;
Physiology, University of Maryland School of Medicine, Baltimore, MD.

Time: Mon. 2:45 PM - 3:20 PM

362.04. Subspine organization of mental disorder risk genes

P. Penzes;
Physiology, Northwestern Univ Feinberg Sch Med, Chicago, IL.

Time: Mon. 3:20 PM - 3:55 PM

362.05. In vivo imaging of synapse dynamics applied to psychiatric disorders

S. Okabe;
Anatomy & Cell Biology, The University of Tokyo, Tokyo, JAPAN.

Time: Mon. 1:30 PM - 1:35 PM

362.01. Introduction

Time: Mon. 3:55 PM - 4:00 PM

362.06. Closing Remarks
Minisymposium

363. New Perspectives for the Rescue of Cognitive Disability in Down Syndrome

Theme C: Disorders of the Nervous System

Location: S105

Time: 10/19/2015 1:30:00 PM - 10/19/2015 4:00:00 PM

Down syndrome is a relatively high-incidence genetic condition caused by the triplication of human chromosome 21. No therapies currently exist for the rescue of cognitive impairment in Down syndrome. This minisymposium will present exciting findings showing that it is possible to restore brain development and cognitive performance in mouse models of Down syndrome with therapies usable in humans. This knowledge provides a breakthrough for the cure and prevention of intellectual disability in Down syndrome.

Time: Mon. 1:30 PM - 4:00 PM

363. Chair

R. Bartesaghi;
Department of Biomedical and Neuromotor Sciences, University of Bologna, Bologna, ITALY.

Time: Mon. 1:30 PM - 4:00 PM

363. Co Chair

D. Bianchi;
Department of Pediatrics, Tufts University School of Medicine, Boston, MA.

Time: Mon. 1:30 PM - 1:35 PM

363.01. Introduction

Time: Mon. 1:35 PM - 1:55 PM

363.02. Cellular and molecular processes affecting development and function of the CNS in Down syndrome

T. F. Haydar;
Department of Anatomy & Neurobiology, Boston University School of Medicine, Boston.

Time: Mon. 1:55 PM - 2:15 PM

363.03. Preventive therapies for cognitive disability in Down syndrome: the sooner the better
R. Bartesaghi;
Department of Biomedical and Neuromotor Sciences, University of Bologna, Bologna, ITALY.

Time: Mon. 2:15 PM - 2:35 PM

363.04. A genomic approach to the identification of novel therapies for prenatal treatment of Down syndrome

D. Bianchi;
Department of Pediatrics, Tufts University School of Medicine, Boston.

Time: Mon. 2:35 PM - 2:55 PM

363.05. Targeting the excitation inhibition balance in Down syndrome

J. Delabar;
Unit of Functional and Adaptative Biology (BFA), CNRS-University Paris Diderot, Paris, FRANCE.

Time: Mon. 2:55 PM - 3:15 PM

363.06. Multicomponent non-pharmacological approaches in combination with drug treatments

M. Dierssen;
CRG-Center for Genomic Regulation, CRG-Center for Genomic Regulation, Barcelona, SPAIN.

Time: Mon. 3:15 PM - 3:35 PM

363.07. Therapeutic approaches to delay the cognitive decline and degenerative processes in older mouse models of Down syndrome

C. Martinez-Cué;
Department of Physiology and Pharmacology, Faculty of Medicine University of Cantabria, Santander, SPAIN.

Time: Mon. 3:35 PM - 4:00 PM

363.08. Closing Remarks

Minisymposium

364. Disrupted Sleep: From Molecules to Cognition

Theme E: Integrative Systems: Neuroendocrinology, Neuroimmunology, and Homeostatic Challenge
 Whereas it remains enigmatic whether neuroscience can ultimately define a single key function of sleep for all organisms, it is becoming clear that disruption of sleep interferes profoundly with their normal functioning. This minisymposium will present an integrated overview of compelling new evidence showing that sleep disruption leads to significant negative consequences for brain function across many different levels, ranging from molecules to cognition, with broad health implications.

364. Chair

E. J. W. Van Someren;
Sleep & Cognition, Netherlands Institute for Neuroscience, Amsterdam, NETHERLANDS.

364. Co Chair

C. Cirelli;
Psychiatry, University of Wisconsin, Madison, Madison, WI.

364.01. Introduction

364.02. The effect of disrupted sleep on ultrastructure of brain cells and synaptic homeostasis

C. Cirelli;
Psychiatry, Univ Wisconsin/Madison, Madison, WI.

364.03. The effect of disrupted sleep on circadian rhythmicity in human gene expression

D. Dijk;
Faculty of Health and Medical Sciences, University of Surrey, Guildford, UNITED KINGDOM.

364.04. The effect of disrupted sleep on hormones and metabolism
The medial prefrontal cortex (mPFC) consists of multiple subregions that contribute differentially to emotional regulation and exhibit selective dysfunction in psychiatric disorders. However, uncertainty over functional homology across species hinders the translation of animal studies to those of humans. The presenters will highlight new insights into how mPFC subregions regulate emotion across three species: rodents, monkeys, and humans, and their relevance for our understanding of disease.
**Time:** Mon. 1:30 PM - 4:00 PM

365. Chair

**H. F. Clarke;**  
Physiology, Development and Neuroscience, University of Cambridge, Cambridge, UNITED KINGDOM.

**Time:** Mon. 1:30 PM - 1:35 PM

365.01. Introduction

**Time:** Mon. 1:35 PM - 1:55 PM

365.02. Dorsal medial prefrontal - amygdala interactions in anxious humans: from adaptive to pathological anxiety

**O. J. Robinson;**  
Institute of Cognitive Neuroscience, University College London, London, UK, UNITED KINGDOM.

**Time:** Mon. 1:55 PM - 2:15 PM

365.03. The medial prefrontal cortex and the generation of negative affect in humans: implications for mental health and disease

**C. L. Philippi;**  
Department of Psychiatry, University of Missouri-St. Louis, St. Louis, MO.

**Time:** Mon. 2:15 PM - 2:35 PM

365.04. Prefrontal control of resilience to adverse events

**M. V. Baratta;**  
Institute for Behavioral Genetics, University of Colorado, Boulder, CO.

**Time:** Mon. 2:35 PM - 2:55 PM

365.05. The mPFC differentiates threatening from neutral stimuli via dynamic engagement of the amygdala.

**E. Likhtik;**  
Department of Psychiatry, Columbia University, New York, NY.

**Time:** Mon. 2:55 PM - 3:15 PM

365.06. The role of the macaque subcallosal ACC in regulating emotional responses.
**P. H. Rudebeck:**
Department of Neuroscience, Mt Sinai Hospital, New York, NY.

**Time:** Mon. 3:15 PM - 3:35 PM

365.07. Opposing roles of the marmoset subgenual and perigenual ACC in positive and negative emotion regulation

**H. F. Clarke:**
Physiology, Development and Neuroscience, University of Cambridge, Cambridge, UNITED KINGDOM.

**Time:** Mon. 3:35 PM - 4:00 PM

365.08. Closing Remarks

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**Symposium**

**453. Synapse Formation and Neurodevelopmental Disorders**

Theme A: Development

**Location:** S100A

**Time:** 10/20/2015 8:30:00 AM - 10/20/2015 11:00:00 AM

Neural transmission and plasticity are critical to how we perceive, think, and react to the world. This relies on synapses. Inappropriate formation of synapses has been implicated in neuropsychiatric disorders and loss of synaptic connection may lead to neurodegenerative disorders. This symposium will provide insights into mechanisms that govern synapse formation and stability in various model systems and shed light on pathophysiological mechanisms.

**Time:** Tue. 8:30 AM - 11:00 AM

453. Chair

**L. Mei:**
Neuroscience and Regenerative Medicine, Georgia Regents University, Augusta, GA.

**Time:** Tue. 8:30 AM - 11:00 AM

453. Co Chair

**C. Legay:**
Neurosciences, Paris Descartes University, Paris, FRANCE.
453.01. Introduction

453.02. Molecular mechanisms controlling synapse formation and stability

**J. Pielage;**
Neuroscience, Friedrich Miescher Institute for Biomedical Research, Basel, SWITZERLAND.

453.03. MuSK and Wnts, their roles in synapse formation and maintenance

**C. Legay;**
Neurosciences, Paris Descartes University, Paris, FRANCE.

453.04. Genetic disorders of neuromuscular transmission

**H. Lochmüller;**
Institute of Genetic Medicine, Newcastle University, Newcastle upon Tyne, UNITED KINGDOM.

453.05. Powering the brain: glycolytic enzymes localize to synapses under energy stress to support synaptic function

**D. A. Colón-Ramos;**
Cell Biology; Program in Cellular Neuroscience, Neurodegeneration and Repair, Yale University, New Haven, CT.

453.06. Closing Remarks

**Symposium**

**454. All-Optical Interrogation of Neural Circuits**

Theme G: Novel Methods and Technology Development

**Location:** S100B
This symposium will describe the nexus of dramatic recent developments in optogenetic probes, genetically encoded activity sensors, and novel microscopies, which together allow the activity of neural circuits to be recorded and manipulated using entirely light. Such an “all-optical” approach promises to illuminate many fundamental challenges in neuroscience, including transforming our search for the neural code and the links between neural circuit activity and behavior.

**Time:** Tue. 8:30 AM - 11:00 AM

454. Chair

**M. Hausser;**
Wolfson Institute for Biomedical Research, University College London, London, UNITED KINGDOM.

**Time:** Tue. 8:30 AM - 11:00 AM

454. Co Chair

**V. Emiliani;**
Neurophotonics Laboratory, CNRS and Paris Descartes University, Paris, FRANCE.

**Time:** Tue. 9:45 AM - 10:20 AM

454.07. Introduction

**Time:** Tue. 10:20 AM - 10:55 AM

454.08. All-optical electrophysiology

**A. Cohen;**
Department of Chemistry and Chemical Biology, Harvard University, Cambridge.

**Time:** Tue. 10:55 AM - 11:00 AM

454.09. Spatially selective holographic photoactivation and functional fluorescence imaging in freely behaving mice

**V. Emiliani;**
Neurophysiology and New Microscopies Laboratory, University of Paris, Paris, FRANCE.

**Time:** Tue. 8:30 AM - 8:35 AM

454.01. Targeting functional cortical ensembles using all-optical interrogation during behaviour
M. Hausser;
Wolfson Institute for Biomedical Research, University College London, London, UNITED KINGDOM.

Time: Tue. 8:35 AM - 9:10 AM

454.011. All-optical neurophysiology in the awake mouse

K. Deisseroth:
Department of Bioengineering, Stanford University, Stanford.

Time: Tue. 9:10 AM - 9:45 AM

454.012. Closing Remarks

Minisymposium

455. Modern Approaches Toward More Predictive Mouse Models of Neurodegenerative Diseases

Theme C: Disorders of the Nervous System

Location: S406A

Time: 10/20/2015 8:30:00 AM - 10/20/2015 11:00:00 AM

Animal models of neurodegenerative diseases have provided important insights into the pathophysiology of disease and suggested potential avenues for therapies. However, translation of these findings to the clinic has been limited. The latest advances in modeling different neurodegenerative disease processes will be presented, as well as the cutting-edge technologies/methodologies that are revolutionizing the field and should provide more predictive models for neurodegenerative diseases.

Time: Tue. 8:30 AM - 11:00 AM

455. Chair

G. R. Howell:
Research Faculty, The Jackson Laboratory, Bar Harbor, ME.

Time: Tue. 8:30 AM - 11:00 AM

455. Co Chair

B. T. Lamb:
Department of Neurosciences, Lerner Research Institute, Cleveland, OH.
455.01. Introduction

**Time:** Tue. 8:30 AM - 8:35 AM

455.02. Modeling disease for therapy development in amyotrophic lateral sclerosis and frontotemporal dementia with C9orf72 expansion.

**C. Lagier-Tourenne;**
Department of Neurosciences, UC San Diego, La Jolla, CA.

**Time:** Tue. 8:35 AM - 8:55 AM

455.03. Conditional and controllable models of Alzheimer's disease for improved spatial and temporal control of transgene expression.

**J. Jankowsky;**
Department of Neuroscience, Baylor College of Medicine, Houston, TX.

**Time:** Tue. 8:55 AM - 9:15 AM


**B. T. Lamb;**
Dept Neurosci, Cleveland Clinic Fndtn, Cleveland, OH.

**Time:** Tue. 9:15 AM - 9:35 AM

455.05. Systems genetics of complex neurodegenerative diseases.

**G. Carter;**
Research Faculty, The Jackson Laboratory, Bar Harbor, ME.

**Time:** Tue. 9:35 AM - 9:55 AM

455.06. Applications of CRISPR-Cas9 for Genome Editing in the Mammalian Brain

**M. Heidenreich;**
Department of Neuroscience, Broad Institute of MIT and Harvard, Boston, MA.

**Time:** Tue. 9:55 AM - 10:15 AM

455.07. Integrated Mouse Genetic and Genomic Approach to Dissect Huntington’s disease Pathogenesis
N. Wang;  
Gonda Center for Neuroscience and Genetics, University of California, Los Angeles, Los Angeles, CA.

**Time:** Tue. 10:35 AM - 11:00 AM

455.08. Closing Remarks

**Minisymposium**

456. **Brainy and Handy: What Robotics and Prosthetics Can Learn from Touch Receptors in the Hand**

Theme D: Sensory and Motor Systems

**Location:** S105

**Time:** 10/20/2015 8:30:00 AM - 10/20/2015 11:00:00 AM

To honor Vernon Mountcastle, experts from somatosensory neurophysiology, psychophysics, and bioengineering will present studies of how the sense of touch might be translated for use in prosthetic or robotic hands. Speakers will define the components of intelligent manipulative sensors based on biological models in the hand. Touch receptors detect object shape, edges and texture, and monitor grip force. Multisensor networks enhance touch information enabling translational application to adaptive mechanical hands.

**Time:** Tue. 8:30 AM - 11:00 AM

456. Chair

**E. P. Gardner;**  
Neuroscience and Physiology, New York University School of Medicine, New York, NY.

**Time:** Tue. 8:30 AM - 8:35 AM

456.01. Introduction

**Time:** Tue. 8:35 AM - 8:55 AM

456.02. Coding and use of tactile signals in object manipulation tasks

**R. S. Johansson;**  
Dept Physiology, Univ Umea, Umea, SWEDEN.

**Time:** Tue. 8:55 AM - 9:15 AM
456.03. Mechanisms of mechanosensory signaling in discriminative touch receptors

E. A. Lumpkin;
Dept Dermatology and Physiology, Columbia University College of P&S, New York, NY.

Time: Tue. 9:15 AM - 9:35 AM

456.04. Geometric feature extraction in the tactile periphery

A. Pruszynski;
Physiology and Pharmacology, Western Univ, Schulich Sch Med & Dent, London, ON, CANADA.

Time: Tue. 9:35 AM - 9:55 AM

456.05. Processing of tactile information in parietal cortex during active touch

E. P. Gardner;
Dept Neuroscience and Physiology, New York University School of Medicine, New York, NY.

Time: Tue. 9:55 AM - 10:15 AM

456.06. Restoring sensory function after upper-limb loss via microstimulation of residual nerve fibers with Utah Slanted Electrode Arrays

G. A. Clark;
Dept. of Bioengineering, University of Utah, Salt Lake City, UT.

Time: Tue. 10:15 AM - 10:35 AM

456.07. An advanced upper extremity prosthetic with sensory feedback for amputees and SCI subjects

M. S. Johannes;
Applied Physics Laboratory, Johns Hopkins University, Laurel, MD.

Time: Tue. 10:35 AM - 11:00 AM

456.08. Closing Remarks

Minisymposium

457. Mood and Reward Networks in Chronic Pain Conditions

Theme C: Disorders of the Nervous System

Location: S103
This session presents new perspectives on mechanisms modulating sensory and affective components of chronic pain. The panel will emphasize studies on networks involved in mood, reward, and motivation. Speakers will cover areas of investigation related to adaptations in cortical and striatal networks under chronic pain conditions, the impact of pain in cortical plasticity and stress/anxiety disorders, the mechanisms by which the brain reward center modulates motivation under chronic pain states, and the intracellular targets of antidepressants in the brain reward center.

**Time:** Tue. 8:30 AM - 11:00 AM

457. Chair

V. Zachariou;
Neuroscience, Icahn School of Medicine at Mount Sinai, New York, NY.

**Time:** Tue. 8:30 AM - 11:00 AM

457. Co Chair

I. Yalcin;
Institute of Cellular and Integrative Neurosciences (INCI), CNRS, Strasbourg, FRANCE.

**Time:** Tue. 8:30 AM - 8:35 AM

457.01. Introduction

**Time:** Tue. 8:35 AM - 8:55 AM

457.02. The impact of pain on motivation

N. Schwartz;
Neurology, UCSF, San Francisco, CA.

**Time:** Tue. 8:55 AM - 9:15 AM

457.03. How expectations, instructions, and beliefs shape pain and aversive learning

L. Atlas;
National Center for Complementary and Integrative Health, National Institutes of Health, Bethesda, MD.

**Time:** Tue. 9:15 AM - 9:35 AM

457.04. Presynaptic and Postsynaptic mechanisms for chronic pain and anxiety
M. Zhuo;  
Department of Physiology, Faculty of Medicine, University of Toronto, Toronto, CANADA.

**Time:** Tue. 9:35 AM - 9:55 AM

457.05. The anterior cingulate cortex as a substrate for chronic pain-induced depression: molecular, lesional and optogenetic evidences.

I. Yalcin;  
Institute of Cellular and Integrative Neurosciences (INCI), UPR3212 CNRS, Strasbourg, FRANCE.

**Time:** Tue. 9:55 AM - 10:15 AM

457.06. Nucleus Accumbens subregions dissociate encoding of values for reward and pain

V. Apkarian;  
Department of Physiology, Northwestern University, Chicago, IL.

**Time:** Tue. 10:15 AM - 10:35 AM

457.07. Intracellular pathways in the Nucleus Accumbens modulate the antiallodynic actions of antidepressants.

V. Zachariou;  
Neuroscience, Icahn School of Medicine at Mount Sinai, New York, NY.

**Time:** Tue. 10:35 AM - 11:00 AM

457.08. Closing Remarks

**Minisymposium**


Theme D: Sensory and Motor Systems

**Location:** S406B

**Time:** 10/20/2015 8:30:00 AM - 10/20/2015 11:00:00 AM

Decision-making is a process by which sensory stimuli are evaluated and used to guide behavior. While much is known about activity within individual cortical areas during visual decision-making, recent advances are giving insight into the circuit mechanisms by which multiple brain areas interact to form decisions. This minisymposium will assemble a diverse group of
researchers studying circuit mechanisms of decision-making with the goal of integrating recent findings from primate and rodent work.

**Time:** Tue. 8:30 AM - 11:00 AM

458. Chair

**D. J. Freedman:**
Neurobiology, The University of Chicago, Chicago, IL.

**Time:** Tue. 8:30 AM - 8:35 AM

458.01. Introduction

**Time:** Tue. 8:35 AM - 8:55 AM

458.02. Causal and correlational perspectives on perceptual decision-making

**A. C. Huk:**
Neuroscience and Psychology, University of Texas at Austin, Austin, TX.

**Time:** Tue. 8:55 AM - 9:15 AM

458.03. Cortical circuit computations underlying stimulus perception

**M. H. Histed:**
Neurobiology, The University of Chicago, Chicago, IL.

**Time:** Tue. 9:15 AM - 9:35 AM

458.04. Decision-related computations in the monkey frontostriatal network

**L. Ding:**
Neuroscience, University of Pennsylvania, Philadelphia, PA.

**Time:** Tue. 9:35 AM - 9:55 AM

458.05. Neural circuits for multisensory decision-making

**A. K. Churchland:**
Cold Spring Harbor Laboratory, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY.

**Time:** Tue. 9:55 AM - 10:15 AM

458.06. Neuronal mechanisms of visual categorization and category learning

**D. J. Freedman:**
Neurobiology, The University of Chicago, Chicago, IL.
458.07. Neuronal microcircuit dynamics in the mouse parietal cortex

**C. D. Harvey;**
Neurobiology, Harvard Medical School, Boston, MA.

**Time:** Tue. 10:35 AM - 11:00 AM

458.08. Closing Remarks

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**Symposium**

**546. Time in Cortical Circuits**

Theme F: Cognition and Behavior

**Location:** S100A

**Time:** 10/20/2015 1:30:00 PM - 10/20/2015 4:00:00 PM

Time is central to cognition. The relationship is complex. Cortical circuits function in the time domain. Yet, neural activity in cortical circuits is fundamental to our perception of time. This symposium will address how cortical circuits generate time-dependent cognition. Speakers will consider novel ways that cortical circuits use timing to enhance function and to tell time and will highlight progress in the understanding of how time perception expands the ability to anticipate stimuli and make decisions.

**Time:** Tue. 1:30 PM - 4:00 PM

546. Chair

**G. T. Finnerty;**
Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UNITED KINGDOM.

**Time:** Tue. 1:30 PM - 4:00 PM

546. Co Chair

**D. V. Buonomano;**
Dept Neurobiol, University of California, Los Angeles, Los Angeles, CA.

**Time:** Tue. 1:30 PM - 1:35 PM

546.01. Introduction
546.02. Time and Rewiring of Cortical Microcircuits

**G. T. Finnerty;**
Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UNITED KINGDOM.

**Time:** Tue. 2:10 PM - 2:45 PM

546.03. Telling time with the neural dynamics of microcircuits

**D. V. Buonomano;**
Dept Neurobiol, UCLA, Los Angeles.

**Time:** Tue. 2:45 PM - 3:20 PM

546.04. Time, decision making and cognition

**M. N. Shadlen;**
Dept Neuroscience, Zuckerman Mind Brain Behavior Institute, HHMI & Columbia University, New York, NY.

**Time:** Tue. 3:20 PM - 3:55 PM

546.05. Temporal expectations in Perception

**A. Nobre;**
Dept Exp Psychol, Oxford University, Oxford, UNITED KINGDOM.

**Time:** Tue. 3:55 PM - 4:00 PM

546.06. Closing Remarks

**Symposium**

**547. Novel Ideas and Tools to Enhance the Neurobiological Study of Drug Addiction with an Eye Toward Intervention Development and Biomarker Identification**

Theme C: Disorders of the Nervous System

**Location:** S100B

**Time:** 10/20/2015 1:30:00 PM - 10/20/2015 4:00:00 PM

This translational symposium presents exciting new scientific directions in the study of human drug addiction. Topics will include the use of integrated positron emission tomography (PET)
scans and magnetic resonance imaging (MRI) to study abnormalities in blood perfusion of the brain in humans and test novel molecular targets, in vivo, as well as the development of cross-species analyses to guide systems-level explorations, and the potential use of brain-computer interfaces to enhance self-control in addiction.

**Time:** Tue. 1:30 PM - 4:00 PM

547. Chair

**R. Goldstein;**
Dept. of Psychiatry and Neuroscience, Icahn School of Medicine at Mount Sinai, New York.

**Time:** Tue. 1:30 PM - 1:35 PM

547.01. Introduction

**Time:** Tue. 1:35 PM - 2:10 PM

547.02. Cardiovascular-brain imaging in human cocaine addiction: use of PET/MR

**N. Alia-Klein;**
Dept. of Psychiatry and Neuroscience, Icahn School of Medicine at Mount Sinai, New York.

**Time:** Tue. 2:10 PM - 2:45 PM

547.03. Technology advances using MR-PET imaging that enable new ways to explore brain function in addiction

**J. Hooker;**
Department of Radiology, Martinos Center for Biomedical Imaging, Charlestown.

**Time:** Tue. 2:45 PM - 3:20 PM

547.04. Using non-human primate histology and imaging to interpret white matter pathway pathophysiology in the human brain: relevance to cocaine addiction

**S. Haber;**
Dept Pharm & Physio, Univ Rochester, Rochester.

**Time:** Tue. 3:20 PM - 3:55 PM

547.05. Brain-computer interfaces for inducing beneficial plasticity: from simple motor skills to addictive behaviors

**J. R. Wolpaw;**
Lab Nerv Sys Disorders, Wadsworth Ctr, NYS Dept of Health & SUNY, Albany.
Minisymposium

548. Clearing and Labeling Methods for High Resolution Imaging of Intact Biological Specimens

Theme G: Novel Methods and Technology Development

Location: S406A

Time: 10/20/2015 1:30:00 PM - 10/20/2015 4:00:00 PM

Recent advances in tissue clearing methods paved the way for scientists to image the tissue of interest as a whole, without sectioning. These approaches are particularly powerful for tracing long neuronal connections in the healthy and diseased central nervous system. During this SfN minisymposium, experts in the field will discuss recent advances in tissue clearing methods and their applications.

Time: Tue. 1:30 PM - 4:00 PM

548. Chair

A. Erturk;
Institute for Stroke and Dementia, Ludwig Maximilian University of Munich, Munich, GERMANY.

Time: Tue. 1:30 PM - 4:00 PM

548. Co Chair

V. Gradinaru;
Biology, California Institute of Technology, Pasadena, CA.

Time: Tue. 1:30 PM - 1:35 PM

548.01. Introduction

Time: Tue. 1:35 PM - 1:55 PM

548.02. Whole-body and whole-brain imaging with single-cell resolution by CUBIC
**H. R. Ueda:**
Center for Developmental Biology Laboratory for Systems Biology, RIKEN / University of Tokyo, Osaka, JAPAN.

**Time:** Tue. 1:55 PM - 2:15 PM

548.03. LUMOS: high-resolution imaging of the entire mouse brain

**O. Efimova:**
Kurchatov Institute ploshchad' Akademika Kurchatova, 1, NRC Kurchatov Institute, Moscow, RUSSIAN FEDERATION.

**Time:** Tue. 2:15 PM - 2:35 PM

548.04. Adaptive tools for automatic tracing and mapping of whole cleared brains

**C. Fowlkes:**
Donald Bren School of Information and Computer Sciences, UC Irvine, Irvine, CA.

**Time:** Tue. 2:35 PM - 2:55 PM

548.05. Structural and Functional Characterization of Organs by 3DISCO Transparency

**A. Erturk:**
Institute for Stroke and Dementia, Ludwig Maximilians University of Munich, Munich, GERMANY.

**Time:** Tue. 2:55 PM - 3:15 PM

548.06. Passive and Whole-body CLARITY for High Resolution Phenotyping of Intact Central and Peripheral Nervous Systems Circuits

**V. Gradinaru:**
Biology, California Institute of Technology, Pasadena, CA.

**Time:** Tue. 3:15 PM - 3:35 PM

548.07. Rapid immunolabeling, clearing and volume imaging of adult and developing brain

**M. Tessier-Lavigne:**
BRAIN DEVELOPMENT AND REPAIR, The Rockefeller University, New York, NY.

**Time:** Tue. 3:35 PM - 4:00 PM

548.08. Closing Remarks
Minisymposium

549. Peripheral Optogenetic Neuromodulation: Progress and Challenges

Theme D: Sensory and Motor Systems

Location: S105

Time: 10/20/2015 1:30:00 PM - 10/20/2015 4:00:00 PM

At the border between the external and internal worlds, the peripheral nervous system is fundamental to understanding the behavior of any living being. Optogenetic control of the peripheral nervous system is a powerful tool for exploration and understanding; however, it brings with it a unique set of challenges. This minisymposium will highlight innovations in peripheral optogenetic neuromodulation and illustrate recent discoveries in pain, sensation, motor systems, and stem cell biology.

Time: Tue. 1:30 PM - 4:00 PM

549. Chair

S. L. Delp;
Bioengineering, Stanford University, Stanford, CA.

Time: Tue. 1:30 PM - 1:35 PM

549.01. Introduction

Time: Tue. 1:35 PM - 1:55 PM

549.02. Optogenetic control of pain and motor circuitry

S. M. Iyer;
Bioengineering, Stanford University, Stanford, CA.

Time: Tue. 1:55 PM - 2:15 PM

549.03. Optical control of stem cell derived motor neurons restores function to paralysed muscles

L. Greensmith;
Sobell Department. & MRC Centre for Neuromuscular Diseases, UCL Institute of Neurology, London, UNITED KINGDOM.

Time: Tue. 2:15 PM - 2:35 PM

549.04. New paradigms in wireless light delivery
A. S. Y. Poon;
Electrical Engineering, Stanford University, Stanford, CA.

Time: Tue. 2:35 PM - 2:55 PM

549.05. An Optogenetic Demonstration of Motor Primitives in the Mouse Spinal Cord

E. Bizzi;
Brain and Cognitive Sciences, MIT, Cambridge, MA.

Time: Tue. 2:55 PM - 3:15 PM

549.06. Optogenetic control of aversive sensory circuitry

S. E. Ross;
Pittsburgh Center for Pain Research, University of Pittsburgh, Pittsburgh, PA.

Time: Tue. 3:15 PM - 3:35 PM

549.07. Optogenetic dissection of visceral pain

R. W. Gereau;
Department of Anesthesiology, Washington University in St. Louis, St. Louis, MO.

Time: Tue. 3:35 PM - 4:00 PM

549.08. Closing Remarks

Minisymposium

550. Selection and Consolidation of Neuronal Circuits: Lessons from Learning and Development

Theme A: Development

Location: S103

Time: 10/20/2015 1:30:00 PM - 10/20/2015 4:00:00 PM

From perception to action, mental functions are mediated by the activities of neuronal circuits. A fundamental challenge in neuroscience is to understand the processes by which neuronal circuits are selected and consolidated for specific information processing tasks. Speakers will present recent studies of these processes in learning and development that afford integrative understanding across multiple levels including population activity and synaptic connection, neuromodulation, and molecular dynamics.
Time: Tue. 1:30 PM - 4:00 PM

550. Chair

K. H. Wang;
Unit on Neural Circuits and Adaptive Behaviors, National Institute of Mental Health, NIH, Bethesda, MD.

Time: Tue. 1:30 PM - 1:35 PM

550.01. Introduction

Time: Tue. 1:35 PM - 1:55 PM

550.02. Imaging Neural Ensembles in Mice During Learning

T. Komiyama;
Neurobiology and Neurosciences, University of California, San Diego, La Jolla, CA.

Time: Tue. 1:55 PM - 2:15 PM

550.03. Orbitalfrontal cortex bouton turnover is enhanced by rule training and scales with prediction error

L. Wilbrecht;
Psychology, University of California Berkeley, Berkeley, CA.

Time: Tue. 2:15 PM - 2:35 PM

550.04. Changes in cortical circuits during development and learning

S. Hofer;
Biozentrum, University of Basel, Basel, SWITZERLAND.

Time: Tue. 2:35 PM - 2:55 PM

550.05. Visualization of learning-related memory trace and its erasure by "Synaptic optogenetics"

A. Hayashi-Takagi;
Center for Disease Biology and Integrative Medicine, The University of Tokyo, Tokyo, JAPAN.

Time: Tue. 2:55 PM - 3:15 PM

550.06. Experience-regulated spatial-temporal dynamics of dendritic spines in the living brain
Y. Zuo:
Molecular, Cell and Developmental Biology, University of California Santa Cruz, Santa Cruz, CA.

Time: Tue. 3:15 PM - 3:35 PM

550.07. Molecular logic underlying motor learning-induced consolidation of neuronal ensembles

K. H. Wang:
Unit on Neural Circuits and Adaptive Behaviors, National Institute of Mental Health, Bethesda, MD.

Time: Tue. 3:35 PM - 4:00 PM

550.08. Closing Remarks

Minisymposium

551. Redox Signaling in Neurological Dysfunction

Theme C: Disorders of the Nervous System

Location: S406B

Time: 10/20/2015 1:30:00 PM - 10/20/2015 4:00:00 PM

Oxidative stress, the imbalance between reactive oxygen species formation and detoxification, participates in the etiology of neurological disorders. Recent findings demonstrate that reductive/oxidative (redox) signaling regulates gene expression, enzyme activity, neuronal fate, and metabolism. This session will examine recent findings regarding the role of oxidative damage, redox signaling, antioxidant response, metabolism, and mitochondrial dysfunction in neurodegeneration, epilepsy, and brain hypoglycemia.

Time: Tue. 1:30 PM - 4:00 PM

551. Chair

R. Franco:
School of Veterinary Medicine and Biomedical Sciences, University of Nebraska-Lincoln, Lincoln, NE.

Time: Tue. 1:30 PM - 4:00 PM

551. Co Chair
L. Massieu; Neuropatologia Molecular, Instituto de Fisiología Celular, Mexico, MEXICO.

**Time:** Tue. 1:30 PM - 1:35 PM

551.01. Introduction

**Time:** Tue. 1:35 PM - 1:55 PM

551.02. Energy Metabolism and Redox Signaling in Dopaminergic Cell Death Induced by Gene-Environment Interactions

R. Franco; School of Veterinary Medicine and Biomedical Sciences, University of Nebraska-Lincoln, Lincoln, NE.

**Time:** Tue. 1:55 PM - 2:15 PM

551.03. Aberrant protein S-nitrosylation in neurodegenerative disorders

T. Nakamura; Center Neuroscience and Aging, The Scintillon Institute, San Diego, CA.

**Time:** Tue. 2:15 PM - 2:35 PM

551.04. Beyond the redox imbalance: oxidative stress contributes to an impaired metabolism in Huntington's disease

M. A. Castro Gallastegui; Instituto de Bioquímica y Microbiología, Universidad Austral de Chile, Valdivia, CHILE.

**Time:** Tue. 2:35 PM - 2:55 PM

551.05. Mitochondrial Antioxidant Defenses in Models of Amyotrophic Lateral Sclerosis

M. R. Vargas; Department of Cell and Molecular Pharmacology and Experimental Therapeutics, Medical University of South Carolina, Charleston, SC.

**Time:** Tue. 2:55 PM - 3:15 PM

551.06. Oxidative Stress and Cell Death During Ischemia/Hypoglycemia

L. Massieu; Neuropatologia Molecular, Instituto de Fisiología Celular, Mexico, MEXICO.

**Time:** Tue. 3:15 PM - 3:35 PM
551.07. Oxidative Stress, Mitochondrial Dysfunction and Epilepsy

M. N. Patel;
School of Pharmacy and Pharmaceutical Sciences, University of Colorado Anschutz Medical Campus, Aurora, CO.

**Time:** Tue. 3:35 PM - 4:00 PM

551.08. Closing Remarks

**Symposium**

640. New Approaches to Understanding How the Hypothalamus Controls Adaptive and Integrative Behavior

Theme E: Integrative Systems: Neuroendocrinology, Neuroimmunology, and Homeostatic Challenge

**Location:** S100A

**Time:** 10/21/2015 8:30:00 AM - 10/21/2015 11:00:00 AM

This symposium will present new genetic and ethological methods that are changing researchers’ ideas about hypothalamic function. Presenters will explore how circuitry controlling the sleep-wake cycle has inbuilt local circadian clocks; how fast and slow signalling onto hypothalamic neurons allows metabolic integration; how such circuitry is also adapted to regulate emotion; and finally, speakers will examine some of the ion channels and receptors involved in governing the activity of these circuitries.

**Time:** Wed. 8:30 AM - 11:00 AM

639. Chair

W. Wisden;
Life Sciences, Imperial College London, London, UNITED KINGDOM.

**Time:** Wed. 8:30 AM - 8:35 AM

640.01. Introduction

**Time:** Wed. 8:35 AM - 9:10 AM

640.02. Local clocks in histaminergic neurons unite circadian and homeostatic sleep drives

W. Wisden;
Life Sciences, Imperial College London, London, UNITED KINGDOM.
**Time:** Wed. 9:10 AM - 9:45 AM

640.03. Hypothalamus: fear and feeding

**C. T. Gross;**  
EMBL, Monterotondo (RM), ITALY.

**Time:** Wed. 9:45 AM - 10:20 AM

640.04. How channels regulate excitability in the brain’s clock: the suprachiasmatic nucleus

**A. Meredith;**  
Dept Physiol, Univ. of Maryland School of Medicine, Baltimore, MD.

**Time:** Wed. 10:20 AM - 10:55 AM

640.05. Independent computations: optogenetic analysis of peptide-small molecule co-transmission and sleep

**A. Adamantidis;**  
Dept of Neurology, Inselspital University Hospital, University of Bern, Bern, SWITZERLAND.

**Time:** Wed. 10:55 AM - 11:00 AM

640.06. Closing Remarks

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**Symposium**

**641. Adolescent Alcohol Exposure: Long-Term Neurobiological and Behavioral Consequences**

Theme C: Disorders of the Nervous System

**Location:** S105

**Time:** 10/21/2015 8:30:00 AM - 10/21/2015 11:00:00 AM

Human studies show that morphological changes in the brain during adolescence contribute to attention, impulse control, information processing, violence, and responses to rewards. Alcohol consumption during adolescence is highly prevalent, and yet very little is known about the long-lasting consequences. The four speakers in this symposium will describe recent findings on behavioral, cellular, molecular, and structural alterations in adult animals after alcohol exposure during adolescence.

**Time:** Wed. 8:30 AM - 11:00 AM
640. Chair

S. Regunathan;
Neuroscience and Behavior, National Institute on Alcohol Abuse and Alcoholism, NIH, Rockville, MD.

Time: Wed. 8:30 AM - 11:00 AM

640. Co Chair

A. Noronha;
Neuroscience and Behavior, National Institute on Alcohol Abuse and Alcoholism, NIH, Rockville, MD.

Time: Wed. 8:30 AM - 8:35 AM

641.01. Introduction

Time: Wed. 8:35 AM - 9:10 AM

641.02. Long-lasting behavioral consequences of adolescent intermittent alcohol: exposure timing and sex matter

L. Spear;
Department of Psychology and Director, Developmental Exposure Alcohol Research Center, Binghamton University, Binghamton, NY.

Time: Wed. 9:10 AM - 9:45 AM

641.03. Enduring effects of Adolescent Ethanol Exposure on functional circuitry of hippocampus and prefrontal cortex

S. Swartzwelder;
Professor of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC.

Time: Wed. 9:45 AM - 10:20 AM

641.04. Persistent Neuroimmune gene induction, Neurodegeneration and altered neurocircuitry following adolescent alcohol exposure

F. Crews;
Professor of Pharmacology and Psychiatry Director, Bowles Center for Alcohol Studies, University of North Carolina at Chapel Hill, Chapel Hill, NC.

Time: Wed. 10:20 AM - 10:55 AM

641.05. Adolescent alcohol drinking has enduring effects on prefrontal myelin
H. Richardson:
Department of Psychological and Brain Sciences, University of Massachusetts Amherst, Amherst, MA.

Time: Wed. 10:55 AM - 11:00 AM

641.06. Closing Remarks

Minisymposium

642. Optogenetic Dissection of the Basal Forebrain Neuromodulatory Control of Cortical Activation, Plasticity, and Cognition

Theme F: Cognition and Behavior

Location: S100B

Time: 10/21/2015 8:30:00 AM - 10/21/2015 11:00:00 AM

The basal forebrain (BF) is a major ascending arousal center and has long been implicated in cognitive functions such as attention and learning. Recent studies using optogenetics to target specific BF cell-types have led to a renaissance in this field and are beginning to yield new insights about circuit mechanisms during behavior. This minisymposium will discuss recent advances in the roles of BF cholinergic and non-cholinergic neurons in cognition via their dynamic modulation of cortical activity.

Time: Wed. 8:30 AM - 11:00 AM

641. Chair

S. Lin:
National Institute on Aging, NIH, Baltimore, MD.

Time: Wed. 8:30 AM - 11:00 AM

641. Co Chair

A. Kepecs:
Neuroscience, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY.

Time: Tue. 1:30 PM - 1:35 PM

642.01. Introduction

Time: Tue. 1:35 PM - 1:55 PM
642.02. Central cholinergic neurons are rapidly recruited by reinforcement feedback

**A. Kepecs;**
Neuroscience, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY.

**Time:** Tue. 1:55 PM - 2:15 PM

642.03. Cholinergic basal forebrain input educes reward timing in the primary visual cortex

**M. G. Hussain Shuler;**
Department of Neuroscience, Johns Hopkins University, Baltimore, MD.

**Time:** Tue. 2:15 PM - 2:35 PM

642.04. Cholinergic signals in mouse barrel cortex during active whisker sensing

**C. C. H. Petersen;**
Laboratory of Sensory Processing, Brain Mind Institute, Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, SWITZERLAND.

**Time:** Tue. 2:35 PM - 2:55 PM

642.05. Non-cholinergic basal forebrain neurons as a gain modulation signal for the decision-making process

**S. Lin;**
National Institute on Aging, National Institutes of Health, Baltimore, MD.

**Time:** Tue. 2:55 PM - 3:15 PM

642.06. Basal forebrain circuit for brain state control

**M. Xu;**
HHMI /UC Berkeley, Berkeley, CA.

**Time:** Tue. 3:15 PM - 3:35 PM

642.07. Moving beyond cholinergic neurons: control of arousal and gamma oscillations by cortically-projecting basal forebrain parvalbumin neurons

**R. E. Brown;**
Psychiatry, VA BHS & Harvard Medical School, Brockton, MA.

**Time:** Tue. 3:35 PM - 4:00 PM

642.08. Closing Remarks
**Minisymposium**

643. 3D Retinal Organoids From Human Pluripotent Stem Cells: Promise to Alleviate Blindness or Better Disease Model?

Theme G: Novel Methods and Technology Development

**Location:** S406A

**Time:** 10/21/2015 8:30:00 AM - 10/21/2015 11:00:00 AM

This minisymposium will bring together translational and basic science researchers who use pluripotent stem cells and adult tissue as tools to repair vision. The promise of 3D retinal organoids derived from stem cells is high. What is not clear is whether this presents only a better model for human retinal diseases or carries a real promise for retinal replacement as well. Speakers will discuss the potential of 3D retinal organoid approach to generate immature human retinal sheets for vision repair.

**Time:** Wed. 8:30 AM - 11:00 AM

642. Chair

**M. Seiler:**
Physical Medicine & Rehabilitation, University of California, Irvine, Irvine, CA.

**Time:** Wed. 8:30 AM - 8:35 AM

643.01. Introduction

**Time:** Wed. 8:35 AM - 8:55 AM

643.02. Human Pluripotent Stem Cell-Derived Retinal Ganglion Cells: Basic Science Applications and Translational Implications

**J. Meyer:**
Engineering Science & Technology, Indiana University, Indianapolis, IN.

**Time:** Wed. 8:55 AM - 9:15 AM

643.03. Re-engineering the retina using 3D-scaffolds

**D. A. Lamba:**
Research on Ageing, Buck Institute for Research on Aging, Novato, CA.

**Time:** Wed. 9:15 AM - 9:35 AM

643.04. 3D-retinal progenitor sheets for vision restoration
M. J. Seiler;
Phys.Med.&Rehab./Sue & Bill Gross Stem Cell Research Center, UC Irvine, School of Medicine, Irvine, CA.

**Time:** Wed. 9:35 AM - 9:55 AM

643.05. Induced to Cure: Engineering iPS Cell Derived RPE Scaffolds to Treat Degenerative Eye Diseases

K. Bharti;
NEI, National Eye Institute (NIH), Bethesda, MD.

**Time:** Wed. 9:55 AM - 10:15 AM

643.06. Epigenetic (DNA methylation) changes in neural retina and RPE in 3D stem cell-derived retinal tissue

I. O. Nasonkin;
Ophthalmology, University of Pittsburgh, Pittsburgh, PA.

**Time:** Wed. 10:15 AM - 10:35 AM

643.07. Building a functional retina with hiPS cells

M. Canto Soler;
Ophthalmology, Johns Hopkins University, Baltimore, MD.

**Time:** Wed. 10:35 AM - 11:00 AM

643.08. Closing Remarks

**Minisymposium**

644. Reward-Driven Learning in Primary Sensory Cortices

Theme D: Sensory and Motor Systems

**Location:** S406B

**Time:** 10/21/2015 8:30:00 AM - 10/21/2015 11:00:00 AM

Maximizing reward and avoiding punishment is an important behavioral drive, and animals routinely learn what stimuli and actions predict favorable and aversive outcomes. This panel will discuss the emerging idea that learning to recognize reward-predicting stimuli involves remodeling at early stages of perception in the primary sensory cortices. Covered topics will
include perceptual learning in the human primary visual cortex, how cortical cells “learn” to predict attributes of the reward, and the underlying synaptic mechanisms.

**Time:** Wed. 8:30 AM - 11:00 AM

643. Chair

**A. Kirkwood;**
Neuroscience & Mind, Brain Institute, Johns Hopkins University, Baltimore, MD.

**Time:** Wed. 8:30 AM - 8:35 AM

644.01. Introduction

**Time:** Wed. 8:35 AM - 8:55 AM

644.02. The role of reward in perceptual learning

**T. Watanabe;**
Cognitive, Linguistic and Psychological Sciences, Brown University, Providence.

**Time:** Wed. 8:55 AM - 9:15 AM

644.03. The effect of reward on sleep consolidation involving the primary visual cortex

**Y. Sasaki;**
Department of Cognitive, Linguistic & Psychological Sciences, Brown University, Providence, RI.

**Time:** Wed. 9:15 AM - 9:35 AM

644.04. Coding of anticipatory information in the gustatory system of alert rodents

**A. Fontanini;**
Department of Neurobiology and Behavior, Stony Brook University, Stony Brook, NY.

**Time:** Wed. 9:35 AM - 9:55 AM

644.05. Eligibility traces for LTP and LTD in cortex

**A. Kirkwood;**
neuroscience & mind/brain institute, Johns Hopkins University, baltimore.

**Time:** Wed. 9:55 AM - 10:15 AM

644.06. Theta oscillations in visual cortex emerge with experience to convey expected reward time and experienced reward rate
644.07. Stable reinforcement learning via temporal competition between LTP and LTD synaptic eligibility traces.

H. Shouval;
Neurobiology and anatomy, University of Texas at Houston, Houston.

Time: Wed. 10:35 AM - 11:00 AM

644.08. Closing Remarks

Minisymposium

738. Corticospinal Motor Neurons in Health and Disease

Theme C: Disorders of the Nervous System

Location: S100B

Time: 10/21/2015 1:30:00 PM - 10/21/2015 4:00:00 PM

The corticospinal motor neurons (CSMN) act as the “spokesperson” of the cerebral cortex for the initiation and modulation of voluntary movement. Their health is critical for the proper function of motor neuron circuitry and their degeneration is key in numerous motor neuron diseases in which voluntary movement is impaired. Recent developments suggest a key role for CSMN in disease progression and pathology. These neuron populations deserve better attention and understanding.

Time: Wed. 1:30 PM - 4:00 PM

737. Chair

H. Ozdinler;
Department of Neurology, Northwestern University, Chicago, IL.

Time: Wed. 1:30 PM - 1:35 PM

738.01. Introduction

Time: Wed. 1:35 PM - 1:55 PM
738.02. Understanding the cellular basis of CSMN vulnerability and progressive degeneration

H. Ozdinler;
Department of Neurology, Northwestern University, Chicago, IL.

Time: Wed. 1:55 PM - 2:15 PM

738.03. Combining human iPSC's and animal models to determine the role of the upper motor neuron in ALS

C. Svendsen;
Regenerative Medicine, Cedars-Sinai Medical Center, Los Angeles, CA.

Time: Wed. 2:15 PM - 2:35 PM

738.04. Cortical circuits from a corticospinal neuron perspective

G. M. G. Shepherd;
Department of Physiology, Northwestern University, Chicago, IL.

Time: Wed. 2:35 PM - 2:55 PM

738.05. Insights into UMN dysfunction in ALS utilizing Transcranial Magnetic Stimulation

N. Geevasinga;
Dept of Neurophysiology, University of Sydney and Westmead Hospital, Wentworthville, AUSTRALIA.

Time: Wed. 2:55 PM - 3:15 PM

738.06. Molecular mechanisms of corticospinal motor neuron degeneration and regeneration in ALS

C. Rouaux;
Faculté de Médecine, Université de Strasbourg, Strasbourg, FRANCE.

Time: Wed. 3:15 PM - 3:35 PM

738.07. Molecular development, diversity, degeneration, and regeneration of corticospinal motor neurons

J. D. Macklis;
MGH-HMS Ctr Nervous Syst Rep, Harvard University, Cambridge, MA.

Time: Wed. 3:35 PM - 4:00 PM

738.08. Closing Remarks
Minisymposium

739. Pain and Poppies: the Good, the Bad, and the Ugly of Opioid Analgesics

Theme D: Sensory and Motor Systems

Location: S406A

Time: 10/21/2015 1:30:00 PM - 10/21/2015 4:00:00 PM

Opioid analgesics are the cornerstone of modern pain therapy. However, their use is plagued with major side effects, such as a loss of pain relieving effects (analgesic tolerance), paradoxical pain (hyperalgesia), and addiction. This session will highlight recent breakthroughs in understanding the key causes of these adverse effects and explore the cellular control of opioid systems in reward and aversion. The findings will challenge traditional views of the good, the bad, and the ugly of opioids.

Time: Wed. 1:30 PM - 4:00 PM

738. Chair

T. Trang:
Physiology & Pharmacology, University of Calgary, Calgary, CANADA.

Time: Wed. 1:30 PM - 4:00 PM

738. Co Chair

C. Cahill:
Anesthesiology & Perioperative Care, University of California, Irvine, Irvine, CA.

Time: Wed. 1:30 PM - 1:35 PM

739.01. Introduction

Time: Wed. 1:35 PM - 1:55 PM

739.02. Pain, Poppies, and P2X7 receptors

T. Trang:
Physiology & Pharmacology, University of Calgary, Calgary, CANADA.

Time: Wed. 1:55 PM - 2:15 PM

739.03. Microglial P2X4 receptors in morphine hyperalgesia
M. Salter;
Neurosciences & Mental Health Program, Hospital for Sick Children, Toronto, CANADA.

**Time:** Wed. 2:15 PM - 2:35 PM

739.04. Not the Holy Grail, but the Energizer bunny: sustained pain relief without narcotic tolerance

**H. Gutstein:**
Anesthesiology and Perioperative Medicine, MD Anderson Cancer Center, Houston, TX.

**Time:** Wed. 2:35 PM - 2:55 PM

739.05. Loss of spinal A3 adenosine receptor signaling contributes to opioid antinociceptive tolerance and hyperalgesia

**D. Salvemini:**
Pharmacological and Physiological Science, Saint Louis University School of Medicine, St. Louis, MO.

**Time:** Wed. 2:55 PM - 3:15 PM

739.06. Chronic pain causes dysfunction in reward circuitry

**C. Cahill:**
Anesthesiology & Perioperative Care, University of California Irvine, Irvine, CA.

**Time:** Wed. 3:15 PM - 3:35 PM

739.07. Distinct subpopulations of dynorphin neurons drive aversion and reward

**R. Al-Hasani:**
Anesthesiology and Anatomy, Washington University, St. Louis, MO.

**Time:** Wed. 3:35 PM - 4:00 PM

739.08. Closing Remarks

**Minisymposium**

**740. Emerging Insight Into the Critical Role of Astrocyte Ion Channels in Homeostasis and Neuron-Glia Signaling**

Theme B: Neural Excitability, Synapses, and Glia: Cellular Mechanisms

**Location:** S105
The critical role of astrocyte potassium channels in central nervous system homeostasis has been reemphasized by recent studies conducted in animal disease models. Emerging evidence also supports the signaling role mediated by astrocyte ion channels, such as BEST1, hemichannels, and two-pore channels; these channels enable astrocytes to interact with neurons and regulate synaptic transmission and plasticity. This minisymposium will highlight the recent development and future perspective of these research areas.

**Time:** Wed. 1:30 PM - 4:00 PM

739. Chair

**M. Zhou;**
Neuroscience, Ohio State University, Columbus, OH.

**Time:** Wed. 1:30 PM - 4:00 PM

739. Co Chair

**M. L. Olsen;**
Cell, Developmental and Integrative Biology, University of Alabama at Birmingham, BIRMINGHAM, AL.

**Time:** Wed. 1:30 PM - 1:35 PM

740.01. Introduction

**Time:** Wed. 1:35 PM - 1:55 PM

740.02. Astrocyte dysfunction in Huntington’s disease

**B. Khakh;**
Physiology, University of California, Los Angeles, Los Angeles, CA.

**Time:** Wed. 1:55 PM - 2:15 PM

740.03. Deficits in astrocyte mediate potassium homeostasis contribute to Rett Syndrome disease pathogenesis

**M. L. Olsen;**
Cell, Developmental and Integrative Biology, University of Alabama At Birmingham, BIRMINGHAM, AL.

**Time:** Wed. 2:15 PM - 2:35 PM
740.04. Glial face of EAST/SeSAME-Syndrome, Epilepsy, Autism and MS: critical role of polyamine and sodium in Kir4.1 and GLT1/GLAST interactions

S. N. Skatchkov;
Biochem & Physiology, Univ Central Del Caribe, Bayamon, PR.

Time: Wed. 2:35 PM - 2:55 PM

740.05. mGluR3-mediated TWIK-1 membrane expression and ammonium homeostasis in astrocytes

M. Zhou;
Department of Neuroscience, Ohio State University, Columbus, OH.

Time: Wed. 2:55 PM - 3:15 PM

740.06. Best1’s role in tonic GABA release and neurological diseases

J. C. Lee;
Center for Neural Science and Center for Functional Connectomics, Korea Advanced Institute of Science and Technology, Seoul, KOREA, REPUBLIC OF.

Time: Wed. 3:15 PM - 3:35 PM

740.07. Astroglial connexin hemichannels tune glutamatergic synaptic transmission through ATP signaling

N. Rouach;
Neuroglial Interactions in Cerebral Physiopathology, College De France CIRB, Paris, FRANCE.

Time: Wed. 3:35 PM - 4:00 PM

740.08. Closing Remarks

Minisymposium

741. Understanding Goal-Directed Decision Making in Humans: Computations and Circuits

Theme F: Cognition and Behavior

Location: S406B

Time: 10/21/2015 1:30:00 PM - 10/21/2015 4:00:00 PM
Goal-directed action selection is critical for adaptive behavior. But fundamental questions remain about its neural realization in humans. What circuits are functionally involved? What computations do these circuits perform? How do these systems interact with other processes that contribute to action selection, and how are these interactions impaired in clinical disorders? The work presented in this minisymposium will offer a fresh view of the computational and neural mechanisms for human goal-directed choice.

**Time:** Wed. 1:30 PM - 4:00 PM

740. Chair

A. Shenhav;
Princeton Neuroscience Institute, Princeton University, Princeton, NJ.

**Time:** Wed. 1:30 PM - 4:00 PM

740. Co Chair

R. W. Morris;
School of Psychology, University of New South Wales, Sydney, AUSTRALIA.

**Time:** Wed. 1:30 PM - 1:35 PM

741.01. Introduction

**Time:** Wed. 1:35 PM - 1:55 PM

741.02. Memory in action: The hippocampus' role in guiding goal-directed behavior

A. M. Bornstein;
Princeton Neuroscience Institute, Princeton University, Princeton, NJ.

**Time:** Wed. 1:55 PM - 2:15 PM

741.03. Competition and cooperation between multiple learning systems

S. Gershman;
Department of Psychology, Harvard University, Cambridge, MA.

**Time:** Wed. 2:15 PM - 2:35 PM

741.04. Model-based causal induction

A. Collins;
Laboratory of Neural Computation and Cognition, Brown University, CLPS, Providence, RI.

**Time:** Wed. 2:35 PM - 2:55 PM
741.05. Neural representations of causal power

**M. Liljeholm;**
Department of Cognitive Sciences, UC Irvine, Irvine, CA.

**Time:** Wed. 2:55 PM - 3:15 PM

741.06. Competition for predictive value in goal-directed learning

**R. W. Morris;**
School of Psychology, University of NSW, Sydney, AUSTRALIA.

**Time:** Wed. 3:15 PM - 3:35 PM

741.07. Model-based learning deficits track compulsivity trans-diagnostically

**C. M. Gillan;**
Department of Experimental Psychology, University of Cambridge, Cambridge, UNITED KINGDOM.

**Time:** Wed. 3:35 PM - 4:00 PM

741.08. Closing Remarks