Minisymposia

Stay up to date at
www.sfn.org/minisymposia

CME This activity has been approved for *AMA PRA Category 1 Credit*™. Visit www.sfn.org/cme for details.

Theme A: Development

Using Human Pluripotent Stem Cells To Study Neural Development and Diseases CME
Chair: Yi Sun, PhD
Tuesday, Oct. 20, 8:30–11 a.m.
McCormick Place: Room S105
Human pluripotent stem cells, including embryonic stem cells, as well as induced pluripotent cells, can be differentiated into functional neurons and glial cells, which form functional neural networks in culture. This minisymposium discusses the most up-to-date advancement of using these stem cell technologies to study human neural cell differentiation and maturation and establish novel neurological disease models for the study of etiology and development of therapeutic interventions.

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

Extrasynaptic GABAA Receptors: Form, Pharmacology, and Function CME
Chair: David W. Cope, PhD
Co-chair: Delia Belelli, PhD
Sunday, Oct. 18, 1:30–4 p.m.
McCormick Place: Room S406B
Extrasynaptic GABAA receptors generate "tonic" inhibition, and are recognized as a major player in GABAA receptor physiology. This minisymposium explores aspects of extrasynaptic GABAA receptors from the molecular level to the behaving animal to give an overview of this exciting field of research. Presentations will focus on structure-function relationships, targeting by endogenous and clinically relevant compounds, and contribution to both physiological and pathophysiological processes.

New Concepts of Potassium Channel Function: From Biochemical Networks to Systems Neurobiology CME
Chair: Anastasios V. Tzingounis, PhD
Monday, Oct. 19, 8:30–11 a.m.
McCormick Place: Room S105
Recent work has shown that potassium channels have multiple roles in brain physiology beyond their traditional function in the action potential. This minisymposium will present work demonstrating that potassium channels are integral components of neuronal biochemical networks whose regulation has profound influence in synaptic plasticity, epilepsy, alcohol tolerance, pain, and sleep. The use of novel photochemistry to probe potassium channel function *in vitro* and *in vivo* also will be explored.

Oscillations and Brain Function: Setting the Neuronal Tempo in Health and Disease CME
Chair: Liset Menendez de la Prida, PhD
Wednesday, Oct. 21, 8:30–11 a.m.
McCormick Place: Room S105
Oscillations in different frequency bands reflect electrophysiological signals produced by large ensembles of synchronized neuronal activity. Making and distorting this tempo can shift the brain function from normal to pathological. This minisymposium examines how oscillations are organized during development and then used in multisensory processing and spatial navigation, before looking at the role of synchrony disruption in schizophrenia, motor dysfunction, and epilepsy.

Protein Networks Regulating Dopamine Homeostasis CME
Chair: Ruth G. Perez, PhD
Co-chair: Gonzalo Torres
Tuesday, Oct. 20, 8:30–11 a.m.
McCormick Place: Room S406B
Dopamine contributes significantly to movement, reward, mood, cognition, and addiction. As such, dopamine regulation is a critical factor in wellness and in several dopamine-related disorders. An emerging concept is that protein networks form in pre- and post-synaptic neurons to modulate dopamine homeostasis. This minisymposium focuses on the contributions of interacting proteins that regulate dopamine at the level of synthesis, packaging, release, uptake, and signaling.

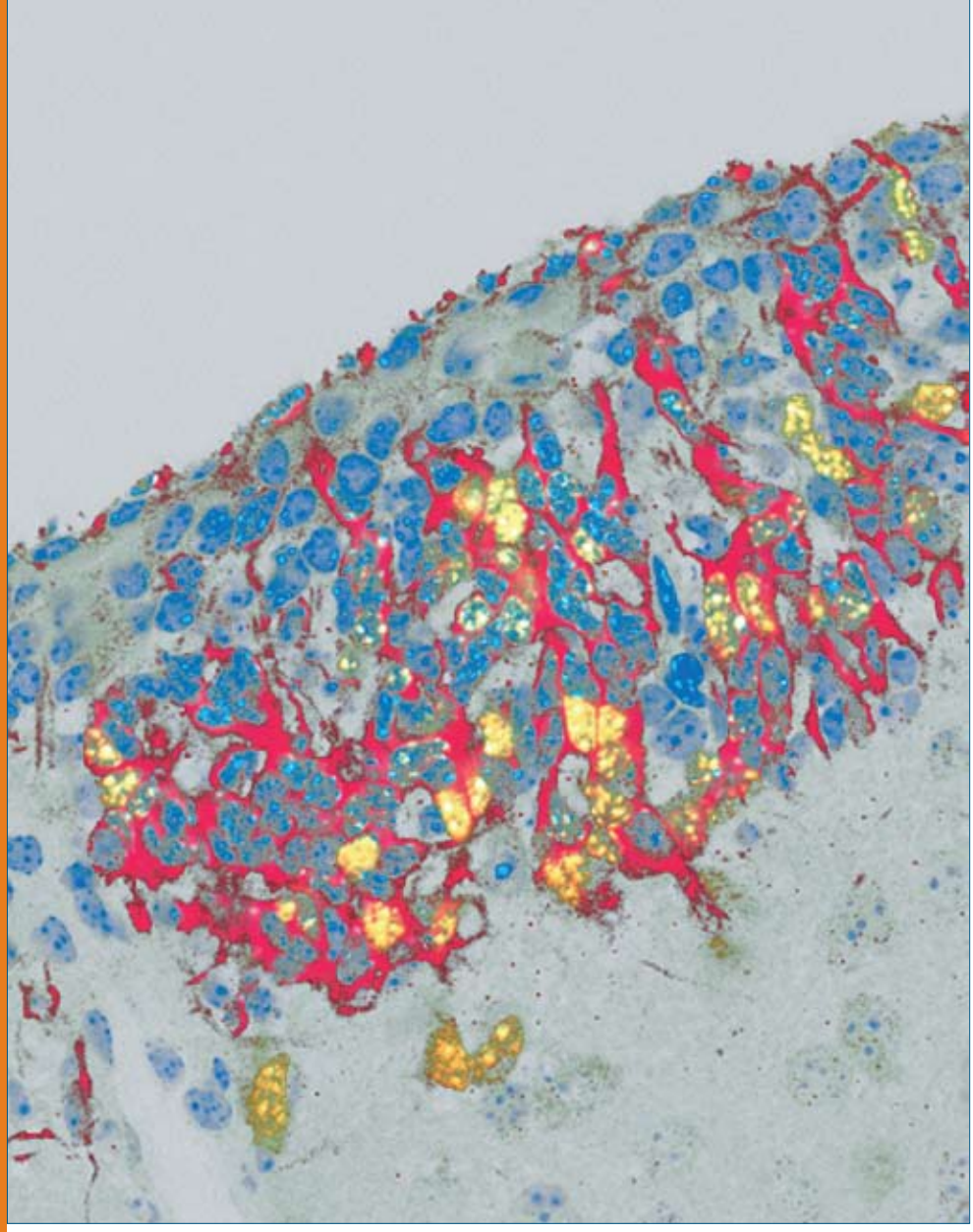
Theme C: Disorders of the Nervous System

Axonal Transport Defects in Neurodegenerative Diseases CME
Chair: Gerardo A. Morfini, PhD
Co-chair: Gustavo Pigino, PhD
Sunday, Oct., 18, 8:30–11 a.m.
McCormick Place: Room S105
In recent years, a significant body of experimental evidence has emerged suggesting that alterations in axonal transport mechanisms might represent a critical pathogenic event in several human neurodegenerative diseases, including Alzheimer's disease, Parkinson's disease, Huntington's disease, Sclerosis, and various motor neuron diseases. The purpose of this minisymposium is to discuss various aspects of these novel scientific findings.

Depolarizing GABA in Development, Maldevelopment, and Seizures: Friend or Foe? CME
Chair: Aristea S. Galanopoulou, MD, PhD
Co-chair: Kevin J. Staley, MD
Tuesday, Oct. 20, 8:30–11 a.m.
McCormick Place: Room S401
Human and animal data, both from epilepsy research and from conditions linked with early life epilepsies (hypoxia, cortical dysplasias) will be presented to discuss how depolarizing GABA(A) signaling affects brain development and seizure susceptibility in the developing brain. Novel methods to improve the efficacy of GABA(A)ergic drugs in the treatment of neonatal seizures will be presented. Finally, special considerations for the effects of such therapies on brain development will be discussed.

Myeloid Cells in the Brain During Health and Disease CME
Chair: Josef Priller, MD
Co-chair: Marco Prinz, MD
Wednesday, Oct. 21, 8:30–11 a.m.
McCormick Place: Room S401
The brain hosts a heterogenous population of myeloid cells, including microglia, macrophages, and monocytes. Thus far, brain macrophages have been discriminated solely on the basis of their localization, morphology, and epitope expression. However, recent data suggest that microglia may be functionally distinct from macrophages, which invade the central nervous system under pathological conditions. A better understanding of the diversity of brain myeloid cells is crucial for our understanding of central nervous system disorders.

Neurogenesis in Aging and in Alzheimer's Disease CME
Chair: Orly Lazarov, PhD
Co-chair: Mark P. Mattson, PhD
Sunday, Oct. 18, 1:30–4 p.m.
McCormick Place: Room S105
The minisymposium discusses recent progress in the understanding of the mechanism underlying aging-linked decline in neurogenesis and its implications for Alzheimer's disease. Speakers will discuss alterations in stem cell biology in the aging brain and their effect on brain maintenance, function, and repair. Intriguing evidence suggesting a role for the familial Alzheimer's disease-linked proteins presenilin-1 and amyloid precursor protein in regulation of neurogenesis will be presented.



The Microcircuitry of Autism CME
Chair: Joshua T. Trachtenberg, PhD
Co-chair: Gordon M.G. Shepherd, MD, PhD
Tuesday, Oct. 20, 1:30–4 p.m.
McCormick Place: Room S105
The central theme of this minisymposium is the identification of the core neural circuit deficits responsible for the behavioral manifestations of autism spectrum disorders (ASD). To this end, the presentations highlight the application of cutting-edge techniques in imaging and physiology to identify deficits in synaptic connectivity, neuronal structure, functional microcircuitry, and macrocircuitry in mouse models of ASD.

The Neuroscience of Hedonics in Dietary Obesity and Eating Disorders: Evidence from Bench to Bedside CME
Chair: Emmanuel N. Pothos, PhD
Wednesday, Oct. 21, 1:30–4 p.m.
McCormick Place: Room S105
Obesity and eating disorders are significant public health problems and demand attention by the neuroscience community. This minisymposium reflects the recent excitement in feeding research in moving beyond the homeostatic control of body weight to the role of brain reward centers and how they alter our understanding of uncontrolled eating. Results from animal models and humans will be highlighted and novel directions in obesity and eating disorder therapeutics will be discussed.

Understanding the Role of DISC1 in Psychiatric Disease and During Normal Development CME
Chair: Nick J. Brandon, PhD
Co-chair: Akira Sawa, MD, PhD
Monday, Oct. 19, 8:30–11 a.m.
McCormick Place: Room S406B
Disrupted in Schizophrenia 1 (DISC1) is a disease risk factor that has the potential to explain and unite the disparate hypotheses underlying mental disorders. This minisymposia integrates knowledge of how DISC1 can contribute to disease by studies of familial and sporadic disease and the pathways it influences to cause these effects, touching on key roles in progenitor cell control, neuronal migration/arborization and synapse regulation discovered through new animal models and cell biology approaches.

Theme D: Sensory and Motor Systems

Common Principles of Adaptation to Natural Environment CME
Chair: Tatyana Sharpee, PhD
Saturday, Oct. 17, 1:30–4 p.m.
McCormick Place: Room S406B
To operate in a fast-changing and complex natural environment, the nervous system must create efficient representations of incoming signals. Even though different senses process drastically different physical signals, they share many of the same statistical characteristics. This minisymposium discusses recent experimental and computational findings in vision, audition, olfaction, and somatosensation that point to the emerging view of common adaptation strategies across sensory modalities.

Functional Properties of Synaptic Transmission in Primary Sensory Organs CME
Chair: Alapakkam P. Sampath, PhD
Co-chair: Joshua H. Singer, PhD
Sunday, Oct. 18, 8:30–11 a.m.
McCormick Place: Room S406B
Recent work indicates that features of sensory perception attributed previously to higher centers reflect neural computation in the primary sensory organs. This minisymposium communicates recent findings enhancing our understanding of neural processing of the sensory receptor output within primary sensory organs. Speakers will describe common themes among the properties of synaptic transmission in vision, audition, and olfaction maximizing the fidelity and dynamic range of sensory signals.

New Insights into Mechanisms of Learning in the Cerebellum CME

Chair: Rebecca M. C. Spencer, PhD
Co-chair: Joern Diedrichsen, PhD
Saturday, Oct. 17, 1:30–4 p.m.
McCormick Place: Room S105

While motor learning has long been held as one of the essential functional roles of the cerebellum, only recently have the mechanisms of such learning come to light. This minisymposium highlights patient and fMRI research demonstrating cortical and sensory contributions to cerebellar learning and research using cerebellar recording, which demonstrates cellular changes supporting learning. The overarching goal is to reassess the extent and limitations of cerebellar learning.

Nonspatial Functions of the Parietal Cortex in Monkey and Humans CME

Chair: Jacqueline P. Gottlieb, PhD
Co-chair: David Freedman, PhD
Tuesday, Oct. 20, 1:30–4 p.m.
McCormick Place: Room S406B

While the parietal lobe is traditionally associated with spatial attention and sensorimotor integration, growing evidence implicates it in nonspatial cognition in humans and nonhuman primates. Presenters highlight recent studies pointing to parietal contributions to memory, attentional dynamics, conflict resolution, object perception, decision making, categorization, and learning, exploring the interface between spatial and nonspatial cognition, and possible homologies between the monkey and human.

Novel Methods in Human Intracranial Electrophysiology CME

Chair: Dona K. Murphey, PhD
Wednesday, Oct. 21, 1:30–4 p.m.
McCormick Place: Room S406B

Single unit and local field activity is recorded in the human brain to localize areas implicated in movement disorders, epilepsy, and severe psychiatric disorders. While implanted with intracranial electrodes for clinical purposes, subjects can perform controlled behavioral experiments. This minisymposium focuses on methodological advances and how the results in human intracranial electrophysiology complement approaches in non-human primates and human fMRI.

Temporal Coding in the Central Auditory System: From Ion Channels to Spatial Hearing CME

Chair: Nace L. Golding, PhD
Co-chair: Catherine E. Carr, PhD
Monday, Oct. 19, 8:30–11 a.m.
McCormick Place: Room S401

The nature of the neural code for sound location is extremely controversial. This minisymposium highlights emerging studies in this area over multiple levels, from brain slice studies highlighting biophysical specializations in axons and dendrites, systems-level studies of binaural circuits, to functional imaging examinations of large-scale neural assemblies in humans. Discussions will underscore common principles across different animal models and identify critical future questions.

Visual Processing in the Mouse CME

Chair: Andrew D. Huberman, PhD
Co-chair: Cristopher Niell, PhD
Wednesday, Oct. 21, 8:30–11 a.m.
McCormick Place: Room S406B

This symposium will present recent work demonstrating the use of the mouse as a genetically tractable system to address long-standing questions in visual processing. Researchers studying a variety of aspects of visual function, including retinal circuitry, cortical processing, and behavioral-state dependence, will present novel genetic methods and technological developments that are generally applicable to studies of neural circuits and sensory systems.

Theme E: Homeostatic and Neuroendocrine Systems

The Epigenetics of Sex Differences in the Brain CME

Chair: Margaret M. McCarthy, PhD
Monday, Oct. 19, 1:30–4 p.m.
McCormick Place: Room S401

Both epigenetic modification of the genome and steroid hormones are important mediators of phenotypic variability in brain and behavior. This minisymposium highlights recent findings that marry these two levels of analysis and illustrate how epigenetics can provide new insights into the origins and function of sex differences in the brain and, in turn, how the study of sex differences in the brain can provide novel insights into epigenetic regulation.

Behavioral Neuroimmunology: Linking the Immune System to Emotionality and Cognition CME

Chair: Katherine Nautiyal, MPhil
Tuesday, Oct. 20, 1:30–4 p.m.
McCormick Place: Room N230

The immune and central nervous systems are traditionally thought to mediate disparate physiological functions, but are now known to be interdependent. This minisymposium highlights recent advances in the field of neuroimmunology by examining discoveries of immune system effects on emotionality and cognition from a breadth of perspectives at the molecular, behavioral, and neural systems levels. Mechanisms of these interactions will be explored in animal and human studies.

Theme F: Cognition and Behavior

Corticostriatal Interactions During Learning and Memory Processing CME

Chair: Cyriel Pennartz, PhD
Monday, Oct. 19, 1:30–4 p.m.
McCormick Place: Room S105

Over the past decades, much work has been done to understand the role of individual cortical and striatal areas in neuroadaptive processes, such as spatial learning and habit formation. However, how the neocortex and hippocampus interact with the striatum is largely unknown. This minisymposium highlights recent advances in the anatomic organization and behavioral significance of these interactions, as well as results from ensemble recordings from striatal, hippocampal, and neocortical areas.

Cycling Behavior and Memory Formation CME

Chair: Jason R. Gerstner, PhD
Co-chair: Gregg W. Roman, PhD
Wednesday, Oct. 21, 1:30–4 p.m.
McCormick Place: Room S401

While there has been significant progress in elucidating the molecular mechanisms that contribute to memory formation and the generation of circadian rhythms, the interaction of these two behaviors has remained obscure. Recently, new studies have shed light on the convergence of these two processes. Studies in human, vertebrate, and invertebrate models that have shown robust time-of-day effects on memory formation and cycling molecules that regulate memory persistence will be presented.

Developmental Social Neuroscience CME

Chair: Nim Tottenham, PhD
Co-chair: Adriana Galvan, PhD
Monday, Oct. 19, 1:30–4 p.m.
McCormick Place: Room S406B

Emergence of mature social behavior has a protracted developmental time course. This minisymposium presents advances in the field of developmental social neuroscience from multidisciplinary (neuroscience, psychology, developmental science), translational, and multi-methodological (neuroimaging, behavior, eyetracking) approaches.