

SfN Preconference Sessions

Preregistration Required Course Fee Professional Development Networking Public Outreach

SfN Preconference Session Fees

SfN preconference sessions are sponsored by the Society and occur prior to the official start of the annual meeting. Paid registration is required for Short Courses and the Neurobiology of Disease Workshop. To attend, add the appropriate course to your annual meeting registration.

*Registration is not required for the Meet-the-Expert Series.

Short Courses 1 and 2

(Includes electronic course book and lunch)

Student member	\$150
Student nonmember	\$225
Postdoctoral member	\$225
Postdoctoral nonmember	\$340
Faculty member	\$295
Faculty nonmember	\$445

Short Course 3

(Includes electronic course book)

Student member	\$100
Student nonmember	\$150
Postdoctoral member	\$150
Postdoctoral nonmember	\$225
Faculty member	\$200
Faculty nonmember	\$300

Neurobiology of Disease Workshop

(Includes breakfast, lunch, and electronic course book)

Student attendee	\$85
Postdoctoral attendee	\$150
Faculty attendee	\$300

FRIDAY, NOV. 2

Neurobiology of Disease Workshop

The Role of Innate Immunity in CNS Disorders Throughout the Lifespan

8 a.m.–5 p.m.

San Diego Convention Center: Room 6A

Organizers: Gwenn Garden, MD, PhD;

Stuart Lipton, MD, PhD;

and John Neumaier, MD, PhD

Contact: training@sfn.org

Support contributed by: the National Center for Complementary and Integrative Health, NIH; the National Institute on Alcohol Abuse and Alcoholism, NIH; and The National Institute of Neurological Disorders and Stroke, NIH

This course will address how neuroinflammation contributes to the pathophysiology of nervous system disorders. The workshop will begin with a patient presentation covering the topic of autoimmune encephalitis. The remainder of the lecture will include an introduction to the innate immune system followed by several examples of how immune dysregulation can lead to diverse clinical problems, including autism, psychiatric disorders, traumatic brain injury, pain, and neurodegenerative disorders. In the afternoon, small groups will discuss these concepts further and introduce research approaches using hiPSC-derived microglia.

Short Course 1

Sex Differences in the Brain: Balancing Sex in Preclinical Research

8 a.m.–6 p.m.

San Diego Convention Center: Room 6B

Organizers: Jill Becker, PhD

and Jessica Tollkuhn, PhD

Contact: training@sfn.org

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This course is designed to enable neuroscientists to incorporate both sexes into their preclinical research. Participants will become familiar with molecular, neural circuit, and behavioral differences between the sexes, with a focus on rodents. Leading experts will review fundamental concepts and the latest discoveries, including the developmental origins of sex differences; gonadal steroid hormones; stress and vulnerability; reward and affective behaviors; and adolescence and puberty. Experimental design considerations and statistical analyses will also be discussed.

Short Course 2

Functional, Structural, and Molecular Imaging, and Big Data Analysis

8 a.m.–6 p.m.

San Diego Convention Center: Room 6C

Organizers: Ed Boyden, PhD, and

Kwanghun Chung, PhD

Contact: training@sfn.org

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We are in an era of great innovation, with new molecular reporters, microscope architectures, and strategies for acquiring and analyzing large physiological and anatomical datasets. How can these technologies be deployed in the service of making the highest-impact discoveries in both basic and applied neuroscience? This short course will cover practical



considerations for how to best combine these cutting-edge tools, with the goal of enabling attendees to select the best technological path for confronting a given scientific question in the fundamental or translational realm.

Short Course 3
Recognizing and Addressing Power Dynamics in Academia 📖 \$ 📖

1–5:30 p.m.
 San Diego Convention Center: Room 11A
 Organizers: Story Landis, PhD; Marguerite Matthews, PhD; Cheryl Sisk, PhD; Keith Trujillo, PhD; and Elisabeth Van Bockstaele, PhD
 Contact: training@sfn.org
Support contributed by: The National Institute of Neurological Disorders and Stroke, NIH

Understanding power dynamics and how they shape professional interactions is key for promoting healthy and productive learning spaces and workplaces as science becomes more global and collaborative. Through short lectures and case study discussions, attendees will explore the nature of power dynamics

and how intersectionality affects the way relative differences in power are experienced by different people. Attendees will also develop skills to manage power dynamics at work and in the classroom.

SATURDAY, NOV. 3
Meet-the-Expert Series Session 1:

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 8–9:15 a.m.
 Hilton Bayfront
 Contact: profdev@sfn.org

From Synapses to Behavior: Uncovering Fundamental Concepts Guiding the Development and Plasticity of Neural Circuits
 Room: Sapphire 410
 Carlos Aizenman, PhD
 Theme A: Development

A common thread in Dr. Aizenman’s work is to understand how multiple types of plasticity interact to allow the brain to change and develop while at the same time functioning robustly. Work in diverse model organisms allows us to better compare fundamental principles driving this process in the nervous system.

Here he will discuss current work on *Xenopus laevis* tadpoles and how this is an ideal preparation for building a holistic approach to study CNS development and plasticity. He will further discuss challenges of working in less popular model organisms and the impact on publishing and funding.

Modeling Spinal Cord Development and Disease With Stem Cell-Derived Neurons

Room: Sapphire Ballroom I
 Hynek Wichterle, PhD
 Theme A: Development
Support contributed by: MilliporeSigma

Stem cell-derived motor neurons provide a unique opportunity to study molecular processes controlling specification of neuronal identity and to probe pathological processes leading to neurodegeneration in patients with amyotrophic lateral sclerosis. Dr. Wichterle will discuss findings that neuronal genes are controlled by distributed enhancers rather than super-enhancers. He will also outline novel approaches to modeling late-onset degenerative diseases in short-term neuronal cultures.

My Personal Journey From Synapse to Circuit and Behavior

Room: Sapphire 400
 Camilla Bellone, PhD
 Theme B: Neural Excitability, Synapses, and Glia

Why do we interact with others? When did we start to do so, and how did we go about it? Dr. Bellone started her career working on cellular mechanisms underlying the synaptic function of defined neuronal circuits during postnatal maturation. Research in her laboratory now focuses on the molecular determinants and

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the circuits that control social behavior in physiological and pathological conditions. Dr. Bellone will discuss her career trajectory balancing her interests in synapses, circuits, and behaviors.

Neurophysiology Guiding Recovery After CNS Injury

Room: Sapphire Ballroom M

Monica Perez, PhD

Theme E: Motor Systems

Dr. Perez's group focuses on understanding how the brain and spinal cord contribute to the control of movement in humans with and without spinal cord injury. Her laboratory investigates transmission in sensory and motor pathways during motor behaviors. A goal of her work is to use this neurophysiological information to develop rehabilitation procedures. In this session, she will discuss her translational science experiences that include building a research program from a basic mechanistic question to design approaches that aim to improve clinical rehabilitation.

From Behavior to Mechanism: The Features and Flaws of Studying Innate and Social Behavior in the Mouse

Room: Sapphire Ballroom E

Lisa Stowers, PhD

Theme F: Integrative Physiology and Behavior

Support contributed by: NeuroLux

Innate behavior is advertised as easy to study, due to its robust performance across and within individuals, and relatively easy to decode, with the expectation that circuits are hardwired. In the mouse, however, no complete innate behavioral circuit has been defined, and mechanistic understanding of the neurons that drive behavior remains largely unknown. Here we will discuss why the promise of innate behavioral circuits has not met its potential, addressing the means and

metrics of analysis, assumptions of circuit coding, and interpreting effects of viral and optogenetic manipulations.

High Channel Count Electrophysiology, Neuropixels, and Beyond: Where Can Technology Take Us?

Room: Sapphire Ballroom A

Timothy Harris, PhD

Theme I: Techniques

Dr. Harris initiated and led the development of Neuropixels, a low-cost, high channel count electrophysiology Si probe, the contribution of which is a long, dense array. The technology used for Neuropixels, in addition to alternative paths for high channel count recording sensors and the origin of limits for these devices, will be the focus of this lecture. The usefulness of higher channel count probes, higher density, the ability to cover more tissue, and combinations with light sources, electrical stimulation, and photometry also will be discussed.

Meet-the-Clinician-Expert: How to Make Your Work/Life Relevant

Room: Sapphire Ballroom B

Y. Joyce Liao, MD, PhD

Theme J: History and Education

Dr. Liao is a physician-scientist and the director of Neuro-Ophthalmology at Stanford University. She will speak about how she uses her clinical practice as the inspiration for her human and animal research studies. Dr. Liao will also talk about the clinical learning opportunities that trainees at Stanford have that all trainees should have in order to obtain sufficient exposure to clinical neurology or ophthalmology to inform and help guide basic research. Finally, Dr. Liao will discuss how she built her family life at the same time as her academic career.

Meet-the-Expert Series Session 2:

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9:30–10:45 a.m.

Hilton Bayfront

Contact: profdev@sfn.org

Understanding the Physiology of New and Old Neurons in the Dentate Gyrus

Room: Sapphire 400

Linda Overstreet-Wadiche, PhD

Theme B: Neural Excitability, Synapses, and Glia

Support contributed by: MilliporeSigma

New neurons are continuously generated throughout life in the dentate gyrus. Dr. Overstreet-Wadiche investigates how various cell types in the dentate gyrus, including newly generated neurons and GABAergic interneurons, contribute to the function of this unique brain region. She also uses it to study how neuronal connections are established and extinguished. In this session, Dr. Overstreet-Wadiche will discuss the choices that shaped the trajectory of her research program, how working with your spouse can work, and why training in synaptic and cellular electrophysiology is a great place to start a career in neuroscience.

Molecular Mechanisms Governing the Blood Brain Barrier Function

Room: Sapphire Ballroom I

Chenghua Gu, PhD

Theme C: Neurodegenerative Disorders and Injury

Support contributed by: MilliporeSigma

The blood brain barrier is the gatekeeper of the CNS and a formidable barrier that prevents most drugs from passing from the bloodstream into the CNS. Dr. Gu's laboratory investigates the fundamental molecular and cellular mechanisms governing the formation and regulation of the blood brain barrier. She will discuss new tools and methods to study the blood brain barrier *in vivo*.

Start Making Sense: Neuronal and Molecular Mechanisms of Sensory Signaling

Room: Sapphire Ballroom E
Piali Sengupta, PhD
Theme D: Sensory Systems

Nearly all environmental cues are filtered by an animal's sensory neurons. These neurons rely on sensory receptors and signaling pathways to detect and discriminate among complex environmental inputs. Dr. Sengupta is a sensory biologist who studies the molecular and neuronal basis of chemo- and thermosensation. She is particularly interested in understanding how context and experience modify sensory neuron properties. She will discuss her career as a sensory neuroscientist, her appreciation of exploratory research, and her positive experiences conducting collaborative work.

Meet-the-Clinician-Expert: A Circuit Model for Addiction: Construction and Translation

Room: Sapphire 410
Christian Lüscher, MD
Theme G: Motivation and Emotion

Christian Lüscher is best known for his work on synaptic plasticity underlying the adaptive behavior in rodent models of drug addiction. The work is rooted in the fact that increases in mesolimbic dopamine levels constitute a defining commonality of addictive drugs. The Lüscher lab has systematically pursued the hypothesis that DA modulates glutamate and GABA transmission, which alter circuit function, eventually changing behavior. More recently this work has led to a novel addiction model based on optogenetic self-stimulation of VTA dopamine neurons. Lüscher will also discuss the translational implications, in particular his effort to design deep brain stimulation protocols to treat cocaine addiction.

Early Life Experience Shapes Brain Development: To Understand Primate Brains From Rodent Works

Sapphire Ballroom B
Tomomi Shimogori, PhD
Theme G: Motivation and Emotion

The development of the brain in early postnatal life is extremely sensitive, complex, and crucial to proper function over the life of a person. Currently, most work is conducted in rodents, primarily because there is a large range of genetic tools that may be used to investigate it; however, the human brain is quite different to the mouse one. Tomomi Shimogori's laboratory has been tackling these differences through its work on rodents but is now developing a model in the common marmoset based around the creation of a gene atlas, which will help to fill the gap in knowledge between that of the rodent brain and that of the human brain.

Decision-Making in the Brain, the Lab, and Beyond

Sapphire Ballroom A
Anne Churchland, PhD
Theme H: Cognition

Dr. Churchland studies the neural mechanisms for perceptual decision-making. Her lab examines behavior in humans and rodents and measures neural activity in rodents. Dr. Churchland is a founding member of the International Brain Laboratory, a group of 21 neuroscientists who aim to uncover neural computations for decision-making. Dr. Churchland prioritizes outreach and scientific communication and maintains a blog, which currently focuses on preprint reviews. She also founded anneslist.net, which highlights women in systems/computational neuroscience.

The Need for Speed: Development and Use of Genetically Encoded Voltage Indicators

Sapphire Ballroom M
Michael Lin, MD, PhD
Theme I: Techniques

Transmembrane voltage measurements are of primary importance in understanding neuronal function. As a part of a growing community of researchers developing genetically encoded voltage indicators, Dr. Lin will provide a summary of the history and current status of these indicators. Dr. Lin will also discuss how his scientific interests ended up at the interface of chemistry and neuroscience, and the unique opportunities and challenges of being a tool developer in the biological sciences.