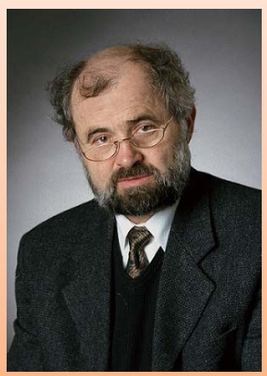
Keynote Speaker



Erwin Neher, PhD

1991 Nobel Laureate in Physiology or Medicine

Professor of Membrane Biophysics

Max Planck Institute for Biophysical Chemistry

Göttingen, Germany

Talk title: Signals And Signaling Mechanisms In The Central Nervous System

Our brain is a network of about 1011 neurons, which are connected by synapses. A neuron typically receives input from about 10000 other neurons. Neurons are prime targets for drugs and therapeutic interference. More specifically, receptors on the surface of these cells as well as ion channels, which mediate ion flow across membranes, are key regulators of cellular function. A large number of hereditary diseases has been linked to dysfunction of ion channels.

The study of transport-related molecules and of their mechanisms of action has received an enormous boost after Bert Sakmann and myself developed the ‘patch clamp technique‘ for recording of the ion currents flowing through individual channels. Furthermore, the so-called ‘whole-cell‘ mode of the technique allowed researchers to study the electrophysiology of small mammalian cell types – particularly with respect to second messenger-mediated signal cascades.

The lecture will cover early work, which led to the discovery of ion channels in cellular membranes. The potential of the patch-clamp technique for the study of cellular signaling will be highlighted, and recent work on ion channels as molecular targets in drug discovery will be reviewed.

Biography

Erwin Neher has been Director of the Membrane Biophysics Department at the Max Planck Institute for Biophysical Chemistry in Goettingen, Germany from 1983 to 2011. He received his Ph.D. in Physics from the Institute of Technology in Munich and did postdoctoral research in the Physiology Department at Yale University. In 1989 he spent a sabbatical at the California Institute of Technology. His research interests have focused on studies of ion channels in neuronal signaling. More recently he studied mechanisms of hormone- as well as neurotransmitter-release and synaptic plasticity.

For his development of the patch clamp technique for recording of ion channel activity he received the 1991 Nobel Prize in Physiology or Medicine (together with Bert Sakmann). He is a member, or foreign member, of several national and international academies, among them the National Academy of Sciences (USA), and the Royal Society, London.

Erwin Neher