

# Title: Recent advances in functional observation of ion channels and synaptic transmission

August 25th (Monday), 10:35-12:30

Rm. 116-118, Songdo CONVENIA, Incheon, Korea

Registration [KSBNS2025.org](http://KSBNS2025.org)

## Organizer



### **Byung-Chang Suh**

Department of Brain Sciences, Daegu Gyeongbuk Institute of Science and Technology (DGIST), Korea

#### Description

: Recent advances in the functional observation of ion channels and synaptic transmission have significantly enhanced our understanding of cellular communication and neural activity. This symposium will explore the intricate interactions between various ion channels and their impact on synaptic transmission in the nervous system, including the turnover of voltage-gated ion channels, unique short-term synaptic plasticity in human cortical neurons, GABAergic signaling, and the role of TRPA1 in the cocaine reward circuit.

## Speakers



### **Yasushi Okamura**

Department of Physiology, Graduate School of Medicine, University of Osaka, Japan

*"In vivo and in vitro studies on turnover of voltage-gated ion channels at the axon initial segments of mammalian neurons"*

He has been investigating the biophysics and physiology of ion channels. His discovery of novel proteins, including the voltage-sensing phosphatase and the voltage-gated proton channel opened a new field of research into cellular electrochemical coupling. This led to the development of genetically encoded voltage indicators and introduced new concepts of voltage-sensitive signaling. His group has uncovered a novel link between gating and membrane targeting of neuronal channels



### **Mean-Hwan Kim**

Department of Brain Sciences, Daegu Gyeongbuk Institute of Science and Technology (DGIST), Korea

*"Unique short-term synaptic plasticity between human cortical pyramidal neurons compared to other mammalian species such as mouse and non-human primate"*

He has been working in the field of synaptic physiology in vertebrate and mammalian visual systems including retinal and cortical circuits. Recently, he has established the preparation of cerebral cortical slices from resected human and non-human primate tissues to investigate evolutionary changes of cell type-specific synaptic transmission, short-term plasticity, and modulatory effects on circuits function in cortical columnar structure.



### **Ji Won Um**

Department of Brain Sciences, Daegu Gyeongbuk Institute of Science and Technology (DGIST), Korea

*"Towards understanding GABAergic synaptic signaling"*

Dr. Um investigates the molecular basis of neurodevelopmental and neuropsychiatric disorders, with a focus on GABAergic synaptic dysfunction. Her lab uses genetic models to study how disrupted inhibitory signaling affects brain function across multiple levels.



### **Se-Young Choi**

Department of Physiology, Seoul National University School of Dentistry, Korea

*"The ion channels modulating the reward circuit in the nucleus accumbens"*

He is a neuroscientist exploring how ion channels and synaptic proteins connect neural circuits to behavior. His work utilizes electrophysiological analysis of neurons and glial cells in brain slices, thereby advancing our understanding of animal behavior and the neural circuit-based pathological mechanisms.