



2025 KSBNS
Symposium 39

Next-generation genetically encoded sensors and actuators for brain exploration

August 26th (Tuesday), 14:30-16:25

Rm.113-115, Songdo CONVENIA, Incheon, Korea

Registration KSBNS2025.org

Organizer



Sangkyu Lee

Center for Cognition and Sociality, Institute for Basic Science, Korea

Synthetic protein engineering has revolutionized modern neuroscience, exemplified by the development of fluorescent proteins for imaging and optogenetic tools for precise control of brain function. This symposium brings together leading experts to present next-generation technologies in brain research, highlighting recent advances in genetically encoded tools—such as indicators for calcium, metabolites, neurotransmitters, and membrane voltage, as well as molecular actuators for targeted neuromodulation. These innovations are accelerating our understanding of brain mechanisms, from cellular activity to complex behaviors.

Speakers



Robert E. Campbell

The University of Tokyo, Japan

"Evolving towards the highest-performance biosensors of neuronal signaling and metabolism"

He is a leading scientist in protein engineering, renowned for developing innovative genetically encoded fluorescent indicators to visualize cellular structures and signaling processes. His recent work continues to expand the toolkit for real-time imaging of ions and metabolites such as sodium, potassium, and lactate, pushing the boundaries of cellular and molecular imaging in neuroscience.



Pojeong Park

Daegu Gyeongbuk Institute of Science and Technology, Korea

"Voltage imaging reveals biophysical basis of associative plasticity rules"

He is a rising neuroscientist specializing in synaptic plasticity and dendritic biophysics, with a strong focus on memory engrams and voltage imaging. His recent work has led to the development of advanced all-optical electrophysiology tools, deepening our understanding of how neurons encode and process information in the living brain.



Jihye Seong

Seoul National University, Korea

"Genetically encoded sensors and actuators for neurotransmitter receptors"

She is a prominent researcher specializing in the development of genetically encoded biosensors and optogenetic tools for visualizing and manipulating intracellular signaling. Her work has significantly advanced our understanding of G protein-coupled receptor dynamics and neuromodulation in living brain cells.



Sangkyu Lee

Institute for Basic Science, Korea

"Sculpting neural circuits via engineered neuron-astrocyte interactions"

He is an expert in molecular optogenetics and synthetic molecular design, dedicated to studying and manipulating the structure and function of the brain. His recent work has enabled real-time visualization of synaptic structural dynamics and precise control of calcium signaling in neurons and glial cells in living animals.