한국뇌신경과학회
The Korean Society for Brain and Neural Sciences

2026 KSBNS

Symposium 23

Visualizing and Remodeling Cellular Connectivity in the Brain

September 8th (Tuesday), 12:40-14:35

Rm.101-102, Daejeon Convention Center, Daejeon, Korea

Registration KSBNS2026.org

Organizer

Sangkyu Lee

Center for Memory and Glioscience, Institute for Basic Science, Korea

This symposium will highlight cutting-edge technologies that enable direct visualization and targeted remodeling of cellular connectivity in the brain. Speakers will present nanoscale imaging of non-synaptic communication pathways, live-tissue optical clearing for deep-layer fluorescence imaging of dynamic neural circuits, large-scale single-neuron projectome reconstruction across species, and synthetic molecular tools for imaging and editing intercellular interactions. Together, these approaches uncover how neural circuits are structured, how different brain cell types communicate across multiple spatial scales, and how connectivity can be experimentally rewritten. This session will appeal to a broad audience interested in neural structure, function, plasticity, disease mechanisms, and the rapidly emerging technologies transforming modern neuroscience.

Speakers

Hyung-Bae Kwon

Johns Hopkins University School of Medicine, USA
"Brain Communication by Dendritic Nanotube Network"

He is a leading neuroscientist renowned for his research on synaptic plasticity, synaptogenesis, and the optical dissection of neural circuit dynamics. His recent study discovered a previously unrecognized dendritic nanotubular network — a non-synaptic intercellular communication system in the brain — demonstrating that these thin conduits actively transport calcium signals and pathological amyloid-beta between neurons, offering a new mechanistic framework for understanding neurodegeneration.

Takeshi Imai

Kyushu University, Japan
"Optical Clearing Strategies for Studying Dynamic Neuronal Circuits"

He is a pioneering scientist in neural circuit formation and advanced brain imaging, best known for developing the landmark SeeDB family of tissue-clearing technologies. His recent work introduces SeeDB-Live — the first isotonic, albumin-based optical clearing medium compatible with living tissues — enabling reversible, non-toxic fluorescence imaging of deep cortical layers in live mouse brains in vivo, substantially expanding both the depth and modality range of functional brain imaging.

Chun Xu

Institute of Neuroscience, Chinese Academy of Science, China
"A Thalamo-Hippocampal Circuit Regulating Memory Precision"

He is a renowned neuroscientist specializing in whole-brain single-neuron projectome mapping and mesoscale connectomics. His group's recent publications — reconstructing 10,100 mouse hippocampal and 2,231 macaque prefrontal cortex single-neuron projectomes — have systematically revealed the organizational principles of brain-wide connectivity and the primate-specific refinement of axon targeting at single-cell resolution.

Sangkyu Lee

Institute for Basic Science, Korea
"Sculpting neural circuits via engineered neuron-astrocyte interactions"

He is an expert in molecular optogenetics and biomolecular design, dedicated to studying and manipulating the structure and function of the brain. His recent work has developed fluorescence imaging tools for real-time monitoring of structural synaptic plasticity and engineered molecular approaches for targeted remodeling of synaptic connections.