2025 KSBNS

Symposium 23

Title: Neuromodulation in the brain: new understanding and emerging methods

August 25th (Monday), 14:30-16:25

206-207, Songdo CONVENSIA, Incheon, Korea

한국뇌신경과학회
The Korean Society for Brain and Neural Sciences

Registration KSBNS2025.org

Organizer

Jung Ho Hyun, Ph.D.

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

Diffuse modulatory systems, including dopaminergic and serotonergic pathways, are essential for maintaining the brain's adaptability, emotional stability, and responsiveness to internal and external cues. This symposium will address key topics in current neuromodulatory system research, including: the development of new optical tools to elucidate how neuronal networks generate complex behaviors, the identification of novel biological features and functions of dopaminergic and serotonergic synapses, the role of basolateral amygdala dopamine signaling in initiating REM sleep, and the modulation of neural ensembles by serotonin to shape trial-specific behavioral strategies.

Speakers

Olivia Andrea Masseck, Ph.D.

Neuromodulatory Circuits, Institute of Zoology, University of Cologne, Germany
"Illuminating the brain: new tools to unravel how neuronal networks generate complex behaviors"

The Masseck Lab develops new tools to illuminate how neuronal circuits interact and combines optogenetics, electrophysiology, imaging, and behavior to decipher the role of neuromodulators in complex behaviors such as decision making, learning, health and disease. Our tools empower the neuroscience community to gain fundamental insights into how neural circuits generate and sustain complex behaviors and brain states.

Jae-Ick Kim, Ph.D.

Department of Biological Sciences, Ulsan National Institute of Science and Technology (UNIST), Korea
"Modulatory synapses in the brain: new biological features and functions of dopaminergic and serotonergic synapses"

His primary research goal is to elucidate the essential features and physiological functions of diffuse modulatory systems and their synapses in health and neurodegenerative diseases, including AD and PD. His findings have provided both fundamental knowledge and a broad conceptual framework for understanding how diffuse modulatory systems regulate neural circuits and behavior in the brain.

Emi Hasegawa, Ph.D.

Department of Systems Biology, Kyoto University, Japan
"Rapid eye movement sleep is initiated by basolateral amygdala dopamine signaling in mice"

Her primary research demonstrates, using advanced neuroscience techniques, that a transient increase in dopamine release in the amygdala precedes the onset of REM sleep and contributes to its initiation. This mechanism also plays a role in the induction of cataplexy, revealing a shared neural basis underlying both REM sleep and cataplexy.

Jung Ho Hyun, Ph.D.

Department of Brain Sciences, Daegu Gyeongbuk Institute of Science and Technology (DGIST), Korea
"Serotonin modulates neural ensemble dynamics to shape trial-resolution behavioral strategies"

Our research aims to develop next-generation, minimally invasive neuromodulation technologies to investigate and therapeutically modulate the neural circuits underlying cognitive flexibility and maladaptive decision-making in drug-resistant neuropsychiatric disorders.