No. 2018-11

Thu., **12 Apr.**, 4pm

Jukhyun Bio Auditorium(RM.121)

School of Life Sciences

Seminar Series

2018 Spring Semester

ENG/KOR

A neural switch for temperature-adaptive sleep behaviors in *Drosophila*

Speaker | Chunghun Lim, Ph.D.

Affiliation | UNIST

Host | Prof. Young-Joon Kim

광주과학기술원 생명과학부

Gwangju Institute of Science and Technology School of Life science

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Abstract

Genes and neural circuits coordinate their elaborative activity to sustain sleep homeostasis. However, it remains elusive how these endogenous factors shape animal sleep in response to environmental changes. Here we demonstrate that synaptic plasticity in GABA transmission onto sleep-promoting dorsal fan-shaped body (dFSB) neurons acts as a neural mechanism important for temperature-adaptive behavioral plasticity in Drosophila sleep. At lower temperatures, opposing effects of the voltage-gated potassium channel Shaker in GABAergic neurons, and of the ionotropic GABA receptors in dFSB, primarily set the duration of daytime sleep. While GABA transmission suppresses cAMP signaling downstream of the constitutively active dopaminergic synapses on dFSB, higher temperatures down-scale the presynaptic GABA transmission, thereby potentiating dopamine transmission in dFSB. Temperature-dependent switching between these two synaptic modalities establishes a flip-flop model, which may adaptively tune the neural activity of dFSB to temperature shifts, and reorganize sleep architecture to the benefit of animal fitness.

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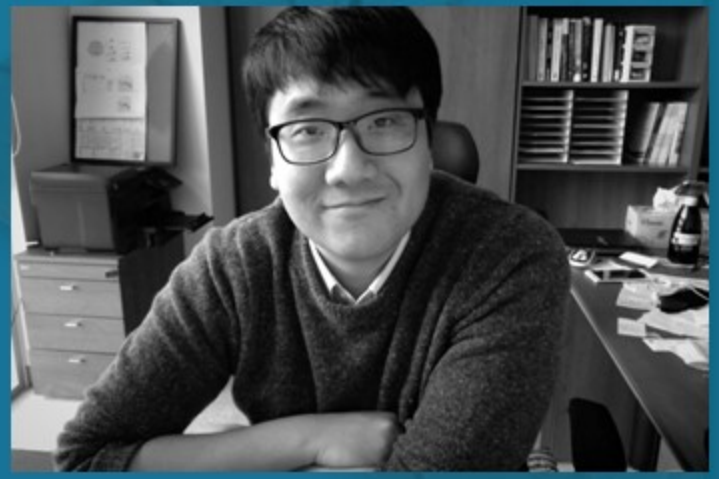

Speaker

Chunghun LIm, Ph.D.

Education/Experience

1995-1999	BS., Biological Sciences, KAIST
1999-2001	MS., Biological Sciences, KAIST
2001-2004	Ph.D., Biological Sciences, KAIST
2004-2007	Postdoctoral fellow, Biological Sciences, KAIST
2007-2013	Postdoctoral fellow, Neurobiology, Northwestern University
2013-2018	Assistant Professor, School of Life Sciences, UNIST
2018-present	Associate Professor School of Life Sciences, UNIST

Research Interests

- Neural and Genetic Bases of Sleep Behaviors and Sleep-relevant Physiology
- Molecular Mechanisms Underlying Neurodegenerative Diseases

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