manitoba neuroscience network

Modulation of neural circuit organization by synaptic suppressors

SEMINAR & VISITING SPEAKER SERIES

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TIME 10:00 AM to 11:00 AM

LOCATION CHOWN A207 A&B

SPEAKER

Jaewon Ko, PhD

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BIO

BSc & MSc, Korea Advanced Institute of Science & Technology (KAIST) (2000, 2002)

PhD, KAIST (2005)

Postdoctoral Fellow, University of Texas Southwestern Medical Centre, Dallas (2007-2008) and Stanford University, Palo Alto (2008-2011)

Assistant Professor, Yonsei University (2011-2015)

Associate Professor, DGIST (2015-2018)

Professor and Director of Center for Synaptic Diversity and Specificity, DGIST (2022- present)

ABSTRACT

Synapses are fundamental information units of the brain that function by establishing and regulating innumerable overlapping and interdigitating neural circuits between neurons. Synaptic cell-adhesion molecules (CAMs) are central synapse organizers that structurally align pre- and postsynaptic membranes and functionally coordinate assembly of pre- and postsynaptic machineries that are essential for instructing cell-type specificity, neuronal specification, and the diversity of individual synapse functions. My laboratory has spent recent years identifying key synaptic CAMs and studying their mechanisms in shaping distinct synaptic signaling pathways. Our hypothesis is that the number, location, and properties of diverse synapses are determined by interactions between pre- and postsynaptic CAMs and their associated signaling molecules, and we refer to the rules by which the network of these proteins build neural circuits as the molecular logic of neural circuit architecture. In this talk, I will discuss our recent studies on modulation of trans-synaptic mechanisms tuned by a specific class of membrane-anchored proteins and touch on potential implications not only for understanding how neural circuits are designed, but also how brain disorders might be driven, at least in part, by synaptic impairments.

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