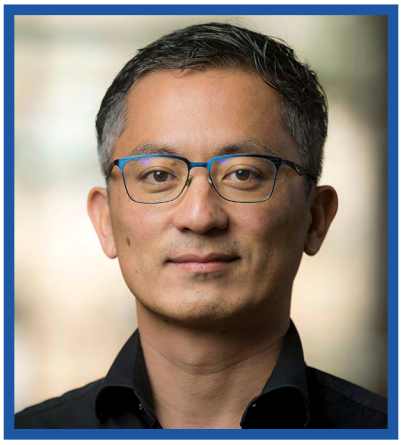
Cortical Plasticity in Health and Disease

April 7

Tuesday, 12:30 pm

Billings Building—Rosedale Room

SPEAKER:



Takaki Komiyama, Ph.D.

Professor, Department of Neurobiology and Department of Neurosciences

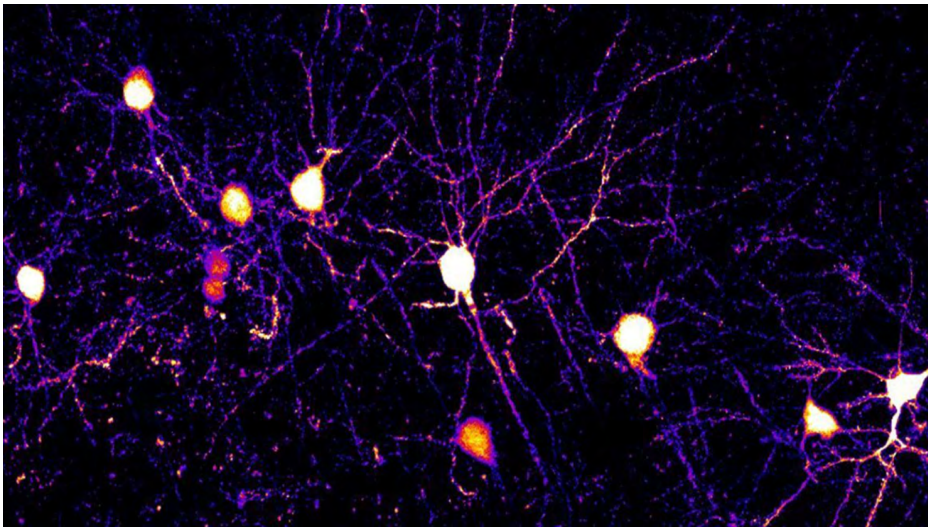
University of California San Diego

Host: Edmund Hollis II, Ph.D.

For more information contact
Darlene White
daw9085@med.cornell.edu

Abstract

My lab studies neural circuit mechanisms of motor learning. Plasticity of excitatory neurons in the cortex is critical for motor learning. In my seminar, I will discuss several projects that investigate the gating of excitatory plasticity by inhibitory circuits. During learning, subtype-specific modulation of inhibitory circuits disinhibits the dendrites of excitatory neurons, permitting learning-related plasticity. This process is downstream to acetylcholine that is released cortex-wide and globally regulates learning-related disinhibition. Furthermore, we have recently discovered that this is a promising target for therapeutic interventions in Huntington's disease.



Publications

1. Wright, W.J.#, Hedrick, N.G., and Komiyama, T.# (2025) *"Distinct synaptic plasticity rules operate across dendritic compartments in vivo during learning."* Science, 388 (6744), 322-328.

2. Ramot, A.*, Taschbach, F.H.*, Yang, Y.C., Hu, Y., Chen, Q., Morales, B.C., Wang, X.C., Wu, A., Tye, K.M., Benna, M.#, and Komiyama, T.# (2025) *"Motor learning refines thalamic influence on motor cortex."* Nature, 643(8072):725-734. doi: 10.1038/s41586-025-08962-8.

3. Yu, B., Yue, Y., Ren, C., Yun, R., Lim, BK., and Komiyama, T. (2025) *"Cholinergic feedback for modality- and context-specific modulation of sensory representations."* Science, 388 (6753), 1324-1329.

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