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TEMASEK LIFESCIENCES LABORATORY

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The Auditorium (Level 1)
Hosted by: Dr YU Fengwei

How do neurons take their unique receptive fields?

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In the developing brain, neurons with common functions are often non-randomly arranged and form dendritic territories in stereotypic spatial patterns throughout the nervous system. In addition, especially during critical periods of development, neurons exhibit a period of juvenile plasticity in which connectivity can be modified in response to sensory input or following specific experiences, thereby providing neurons with new response properties, tailored to the new environment. To achieve these changes in connectivity, certain neurons modify the shape of their dendritic arbors in response to various stimuli. In this lecture, I will introduce the molecular and cellular mechanisms that define the receptive fields, particularly in the Drosophila sensory nervous system as an example.

Dr. Emoto is a professor in the Department of Biological Sciences at the University of Tokyo. Dr. Emoto obtained his B.Sc. and Ph.D. from the University of Tokyo in biochemistry and cell biology. After postdoctoral training with Drs. Yuh-Nung Jan and Lily Jan at HHMI/UCSF, Dr. Emoto joined the faculty of National Institute of Genetics Japan. Dr. Emoto was then appointed as full professor in the Department of Biological Sciences at the University of Tokyo 2013. Dr. Emoto's laboratory investigates the molecular and cellular mechanisms that underlay development and remodeling of dendritic fields of sensory neurons in the Drosophila and mice.

Recent Publications:

1. Yasunaga K, Tezuka A, Ishikawa N, Dairyo Y, Togashi K, Koizumi H and **Emoto K:** Dendrite reshaping of adult Drosophila sensory neurons requires matrix metalloproteinase-mediated modification of the basement membranes. Genes Dev. 29: 1763-1775 (2015).
2. Kanamori T, Yoshino J, Yasunaga K, Dairyo Y and **Emoto K**: Local endocytosis incudes compartmentalized calcium transients to promote dendrite pruning in Drosophila sensory neurons. Nature Communications 6: 6515 (2015).
3. Kanamori T, Kanai M, Dairyo Y, Yasunaga K, Morikawa R and **Emoto K**: Compartmentalized calcium transients trigger dendrite pruning in Drosophila sensory neurons. Science 340: 1475-1478 (2013).