生命科学セミナー

How to combine electron and light microscopy data for searching sleep regulatory circuits

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Connectome means a comprehensive mapping of neural projections and synaptic connections. *Drosophila Melanogaster* is a good model animal for brain connectome which has a very small size of brain but still contains 50,000 neurons per hemisphere. Hemi-brain connectomes of the *Drosophila* brain are ongoing in Janelia Research Campus. The hemi-brain connectomes give us the detail knowledge of anatomy and synaptic connections among clock cells, mushroom body and central complex neurons with the mushroom body (MB) and central complex (CX), which are the center of olfactory learning, motor control, and also sleep regulation. An excellent genetic tool called the split-Gal4 system enables us to induce gene expressions only in the intersection of different promotors combined with DNA-binding domain (DBD) and transcription activation domain (AD) of the Gal4 protein. We tried to make the split-Gal4 of the downstream of clock cells or the upstream to the MB and CX neurons and performed activation screening with the thermo-sensitive dTRPA1. For making split-Gal4 line of the specific neurons found in the electron microscopy data, multiple AD or DBD lines which labeled the same type of neurons are required in the light microscopy data. We developed a new template brain for alignment between electron and light microscopy data and a new searching method using depth-coded color maximal intensity projection (color-MIP). These image processing tools will drastically change and accelerate the *Drosophila* neuroscience.

（発表スライドは英語表記、セミナーは日本語で行われます）

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