第340回 大阪大学神経科学懇話会

日時：**平成28年4月27日（水）18:00 – 19:00**

場所：**共同研究実習センター7階 会議セミナー室**

演者：**今井 猛**

理化学研究所多細胞システム形成研究センター

感覚神経回路形成研究チーム　チームリーダー

演題：SeeDB2 を用いた大規模高解像イメージングとこれを用いた回路機能・回路形成研究

Super-resolution imaging deep inside tissues has been challenging, as it is extremely sensitive to light scattering and spherical aberrations. Here we report an optimized optical clearing agent for high-resolution fluorescence imaging (SeeDB2). SeeDB2 matches the refractive indices of fixed tissues to that of immersion oil (1.518), thus minimizing both light scattering and spherical aberrations. During the clearing process, fine morphology and fluorescent proteins were highly preserved. SeeDB2 enabled super-resolution microscopy of mouse brain slices, fly brains, cultured cells, and mouse oocytes up to a depth of 40-170μm, an order of magnitude deeper than previously possible under standard mounting conditions. Using this approach, we demonstrate accumulation of inhibitory synapses on spine heads in NMDA receptor-deficient neurons. In the fly medulla, we found unexpected heterogeneity in axon bouton orientations among Mi1 neurons, a part of the motion detection circuitry. Thus, volumetric super-resolution microscopy of cleared tissues is a powerful strategy in connectomic studies at synaptic levels.

In this seminar, I will also introduce our ongoing work on neuronal wiring in the mouse olfactory bulb, incorporating tissue clearing, mouse genetics, and in vivo two-photon imaging.

Recent publications:
Imai et al. (2009) *Science* **325**, 585-60.
Ke et al., (2013) *Nat Neurosci* **16**, 1154-1161.
Nakashima et al., (2013) *Cell* **154**, 1314-1325.
Ke et al., (2016) *Cell Rep* **14**, 2718-2732.

※セミナーは日本語で行います
※本講演は、医科学修士課程系別セミナーとして単位が認定されます

連絡先：大阪大学　医学系研究科　　解剖学講座（神経機能形態学）　佐藤　真（内線3221）