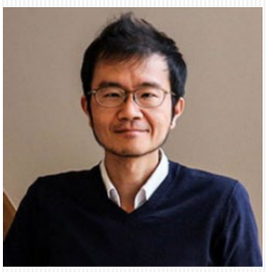
KGRI Lecture Series

Visual motion processing: cell types, circuits, and disease

2019年11月12日（火）　18:00–19:00

場所：慶應義塾大学信濃町キャンパス　総合医科学研究棟　1階ラウンジ



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The brain is assembled from thousands of cell types, which are organized into distinct neuronal circuits that perform neural computations in order to analyse the sensory environment and drive behaviour. Inferring the direction and speed of image motion is a fundamental component of visual computation, and essential for visually guided behavior. Even at the front of the visual stream, in the retina, a number of parallel circuits extract information about image motion. However, it is not yet fully understood how visual motion is extracted by retinal circuits and further processed in downstream brain areas for mediating visually guided behaviors. Furthermore, it remains unclear how specific neuronal connections that support motion detection emerge during development and how its miswiring may lead to disease.

To address these questions my lab combines experimental approaches such as mouse genetics, cell type transcriptomics, proteomics, two-photon imaging, electrophysiology, trans-synaptic circuit labeling, behavioral analysis, and computational modeling. In this talk I will present our recent findings related to three topics: 1) how connectivity of retinal motion-sensitive circuits is altered in a monogenic disease of eye movements, 2) how retinal circuits extract the speed and direction of image motion, and 3) how cortical areas process retina-originated motion signals. Our results highlight highly-specific neuronal connections and genetic mechanisms underlying the visual motion processing in the mammalian central nervous system.

お問い合わせ

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