大学院特別講義

新潟脳神経研究会特別例会の御案内

日　　時：令和７年３月 13 日(木) 16:00～17:00

場　　所：中田記念ホール　脳研究所 旭町総合研究実験棟（統合脳機能研究センター）６階

Diverse GABA signaling in the inner retina enables spatiotemporal coding

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GABA (γ-aminobutyric acid) is the primary inhibitory neurotransmitter in the mammalian central nervous system (CNS). There is a wide range of GABAergic neuronal types, each of which plays an important role in neural processing and the etiology of neurological disorders. However, there is no comprehensive understanding of this functional diversity, due to the lack of genetic tools to target and study the multitude of cell types. Here we perform two-photon imaging of GABA release in the inner plexiform layer (IPL) of the mouse retina using the newly developed GABA sensor iGABASnFR2. By applying varied light stimuli to isolated retinae, we reveal over 40 different GABA-releasing neurons, including some not previously described. Individual types show unique distributions of synaptic release sites in the sublayers comprising the IPL, allowing layer-specific visual encoding. Synaptic input and output sites are aligned along specific retinal orientations for multiple neuronal types. Furthermore, computational modeling reveals that the combination of cell type-specific spatial structure and unique release kinetics enables inhibitory neurons to suppress and sculpt excitatory signals in response to a wide range of behaviorally relevant motion structures. Our high-throughput approach provides the first comprehensive physiological characterization of inhibitory signaling in the vertebrate CNS. Future applications of this method will enable interrogation of the function and dysfunction of diverse inhibitory circuits in health and disease.

どうぞ奮ってご参加ください。　（担当：脳研究所 動物資源開発研究分野）

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