



ONSA/CBIR セミナー

Principles of operation of a learning neural circuit

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日時 2023年6月9日(金) 11:00-12:00

会場 ハイブリッド開催 (対面&オンライン)

会場 : 大学院講義室 2 M&D タワー13 階

ZOOM ウェビナー受講希望者は下記の連絡先までお問い合わせください。

講演要旨

発表言語は英語です (Seminar will be in English)

The cerebellum has long been implicated in motor and non-motor learning. Purkinje cells, the only output cells from the cerebellar cortex, receive inputs over two pathways – mossy fibers and climbing fibers. In Ito's cerebellar learning theory, climbing fibers signal motor errors and cause learning in the simple-spike output of Purkinje cells; simple-spikes are driven by mossy fiber inputs to the cerebellum and affect the firing in downstream circuits. Our circuit-level model of learning reproduces a large body of behavioral and neural data based on four principles: (1) early, fast acquisition is driven by climbing fibers at a site in the cerebellar cortex with poor retention; (2) learning gradually transfers from the cerebellar cortex to the cerebellar nucleus with excellent retention, guided by Purkinje cells' simple spike output; (3) functionally different neural signals are subjected to learning in the cerebellar cortex versus the cerebellar nuclei; and (4) negative feedback from the cerebellum to the inferior olive limits learning. Ongoing goals are to achieve cell-type resolution of all cerebellar cortical interneurons from extracellular recordings and then to determine whether there are multiple sites of learning and how those sites work together during the transition from short-term to long-term learning.

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