



ONSA/CBIR セミナー

Light-intensity coding in the human prefrontal cortex

演者

Prof. Jerome Sanes

Brown university

日時

2023年6月26日(月) 17:00-18:00

会場

対面開催

会場：大学院講義室3 M&Dタワー11階

講演要旨

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

Light intensity affects mood and cognition, and a distinctive component of retinal output encodes absolute light intensity via a pathway derived largely from melanopsin-expressing intrinsically photosensitive retinal ganglion cells (ipRGCs). ipRGCs innervate multiple subcortical targets and drive diverse physiological effects of light including circadian entrainment, pupillary reflexes, and sleep modulation, along with retinal and visual brain development. A relatively direct pathway to the medial frontal cortex in mice appears to mediate mood and learning. Using functional magnetic resonance imaging, we determined that regions in the human prefrontal cortex code light intensity, and that these regions appear to operate independently of occipital regions that also code light intensity. Furthermore, the prefrontal regions have similar to physiological responses of ipRGCs, suggesting that the prefrontal regions that code mood may operate independently from the occipital pathways. Since some prefrontal regions that code light intensity overlap with regions implicated in depression, we also examined whether depressive disorders modified prefrontal responses to light levels. Prefrontal regions in depressed people show light intensity coding, and we found a region in the inferior frontal cortex with different intensity coding in depressed patients. From these experiments, we provide evidence supporting use of light therapy for depression.

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