Poster | New Technologies

[2P]Neural Circuit Manipulation

Thu. Jul 30, 2020 1:30 PM - 3:30 PM Poster Session

***Videos are available throughout the meeting period.**

[2P-266]Optical control of neuron and glial cells function by the multi-points stimulation

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Research into physiological phenomena has taken a leap forward by recent advanced optical imaging techniques. Traditionally, physiological phenomena including cell division, cell functions, organism functions, molecular transport and expression, and signal transduction were detected by biochemical methods. However, this information lacked high resolution spatial or temporal information. Using recent bio imaging techniques, both spatial and temporal information can be integrated across the molecular, cellular and systems levels that allow us to further investigate the hierarchical interaction of organ systems. We have been focused on glia cells and revealed how they can affect the neuronal circuitry activity with their physiological functions. In addition, based on those data, we have used optogenetics to compensate the lack of glial cells functions, which modulates neuronal function required for learning. However technical limitation of optogenetics does not allow us to stimulate multiple cell types with high temporal and spatial resolution. In this research, we are trying to combine holographic stimulation with two photon imaging to stimulate different kinds of cells with higher temporal and spatial resolution and modulate neural activities that contribute to learning and behavior.