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Paper Title: Measuring and inducing the plasticity of single-neuron scale at multiple points

Authors: Toki Kobayashi (The University of Tokyo); Kenta Shimba (The University of Tokyo, Japan); Kiyoshi Kotani (University of Tokyo, Japan); Yasuhiko Jimbo (The University of Tokyo, Japan)

Email: kobayashi-toki@g.ecc.u-tokyo.ac.jp

Abstract

Information processing in the brain is supported by the plasticity of the connections of neurons in biological neuronal networks. There is a gap between our understanding on plasticity of individual connections and that of the neuronal networks. Here, we aimed to induce and measure plasticity at the connections of individual neurons and at the network level. We achieved inducing plasticity with a combination of single cell stimulation by optogenetics and high-resolution extracellular potentials recording by high-density microelectrode array. Spike timing plasticity in a single neuron was successfully measured. Although we also tried to induce synaptic potentiation by tetanus stimulation, no significant change was observed. In the future, we will investigate how the plasticity of individual connections changes dynamics of entire network.
