Presentation Abstract

Program#/Poster#: 819.19/GG5

Presentation Title: Comparative effects of adaptation on supra & infragranular layers in cat’s visual cortex

Location: WCC Hall A-C

Presentation time: Wednesday, Nov 19, 2014, 1:00 PM - 5:00 PM

Presenter at Poster: Wed, Nov. 19, 2014, 3:00 PM - 4:00 PM

Topic: ++D.04.h. Striate cortex: Plasticity

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Abstract: Neurons have a fascinating tendency to change their properties in response to the environment that confers the brain plasticity. Now-a-days, it is widely known that forceful application of a stimulus for a certain duration of time could lead to changes in neuronal properties (Ghisovan et al., 2008) (Bachatene et al., 2013). Visual neurons are classical paradigm to study these adaptation effects. Reports demonstrate that layer2-3 primary visual neurons change their selectivity either towards adapter or away from it contingent upon stimulus duration. Neurons behave in a repulsive fashion in response to short duration (<3 min) whereas longer duration (upto 12 min) mostly reveals attractive shifts (Ghisovan et al., 2008). Layer 2-3 neurons, are the primary computational substrates that receive information from LGN through layer 4 and relay the information to layer 5-6 neurons. Because of their extensive dendritic trees L5 neurons are considered most
important information processing units continuously involved in feed forward and feedback loops in response to an input, but how these neurons respond to adaptation, is a domain yet to be explored. Our preliminary data, through conventional simultaneous recordings in layer2-3&5 of anaesthetised cats, shows that infragranular layer 5 neurons also reprogram themselves in response to the imposed stimulus. L5 neurons shift their orientation tuning curves in a similar fashion as L2-3 suggesting that L2-3 neurons transmit their newly attained orientation tuning to L5 neurons. These preliminary results for the first time indicate that in an adult brain not only the cells pertaining to specific layer learn to respond to an imposed stimulus, but the entire neuronal column changes its preferred orientation.

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