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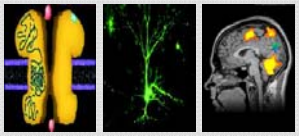

Cortical and subcortical representation of sensory and cognitive memory

April 28 - 29, 2015 Ruhr University Bochum

Wednesday April 29, morning (9:15 – 12:15)

Session 3: **Cortical plasticity as an orchestrator of sensory flexibility**

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Homeostatic plasticity in the mouse visual cortex

Homeostatic regulation has been shown to restore cortical activity in vivo following sensory deprivation, but it is unclear whether this recovery is uniform across all cells or specific to a subset of the network. We used chronic two-photon imaging of GCaMP, a genetically encoded calcium indicator, expressed in awake-behaving adult mice to examine the activity of individual excitatory and inhibitory neurons in layer 2/3 monocular visual cortex following enucleation.

We found that only a fraction of excitatory neurons homeostatically recover activity after deprivation, and inhibitory neuron activity is reduced without exhibiting recovery. Prior to deprivation, excitatory cells that did recover were more likely to have significantly correlated activity with other recovering excitatory neurons, thus forming a subnetwork of recovering neurons. These network level changes are accompanied by a reduction in synaptic inhibition onto all excitatory neurons, suggesting that both synaptic mechanisms and subnetwork activity are important for homeostatic recovery of activity after deprivation.