

IGSN – COLLOQUIUM

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LUTGARDE ARCKENS

Head of Neuroplasticity and Neuroproteomics Unit,
K. U. Leuven, Belgium

Multimodal plasticity in mouse visual cortex

The main research goal of my laboratory aims at resolving the molecular and structural mechanisms of deprivation-induced neocortical reorganization in adult mammals in full detail using the visual system of cats and mice as animal model. Using a combination of deprivation of one eye and stimulation of the remaining eye we previously identified several input-specific subdivisions in mouse visual cortex (Van Brussel et al., 2009).

Using this information as a reference map, we recently established to what extent each of these functional subdivisions take part in cortical reactivation and reorganization upon unilateral enucleation. Recovery experiments reveal a differential laminar and temporal reactivation profile for the different visual cortical regions. Initiation of infragranular recovery of molecular activity near the border with non-visual cortex and simultaneous hyperactivation of this adjacent cortex implies a partial non-visual contribution to this plasticity. A strong effect of somatosensory deprivation as well as stimulation on infragranular visual cortex activation in long-term enucleated animals supports this view. Targeted tracer injections in visual cortex of control and enucleated animals reveal pre-existing connections between the visual and somatosensory cortices of adult mice as possible mediators. Together these observations support an important cross-modal component in reorganization of adult mouse visual cortex upon monocular enucleation.

Guests are welcome !



**International Graduate School
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