

May 8, 2009

Extracellular regulation of cortical plasticity

Tommaso Pizzorusso

Istituto Neuroscienze CNR, Pisa
Area Ricerca CNR

ABSTRACT OF THE TALK

Our lab has been investigating several factors regulating ocular dominance plasticity in the visual cortex. Our initial work revealed that Chondroitin sulphate proteoglycan (CSPG) removal from the adult visual cortex by means of intracortical infusion of chondroitinase ABC (chABC) activates mechanisms of ocular dominance plasticity. These results led to the demonstration that chABC promotes recovery from amblyopia in the adult rat.

We have now investigated whether chABC treatment facilitates functional recovery from experimental stroke. Stroke was induced in the forelimb area of the motor cortex by means of endothelin-1 injection. ChABC was administered locally in the affected cortex either in concomitance with stroke induction or one week after the stroke. In both cases, chABC promoted recovery of the affected limb assessed with the skilled reaching task. Size of the lesion was the same in chABC and control treated animals.

CSPGs are also diffusely present in the brain extracellular space but they are also condensed in perineuronal nets. The involvement of specific molecular components of the perineuronal nets and extracellular proteolysis in ocular dominance plasticity will be discussed.