

# Targeting Trends

*Reporting the latest news in Molecular Surgery*

## Subplate Neurons and Functional Maturation of Thalamocortical Synapses

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- ◆ Rat-ZAP, the newest Second Immunotoxin  
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*Denise Higgins, Editor*

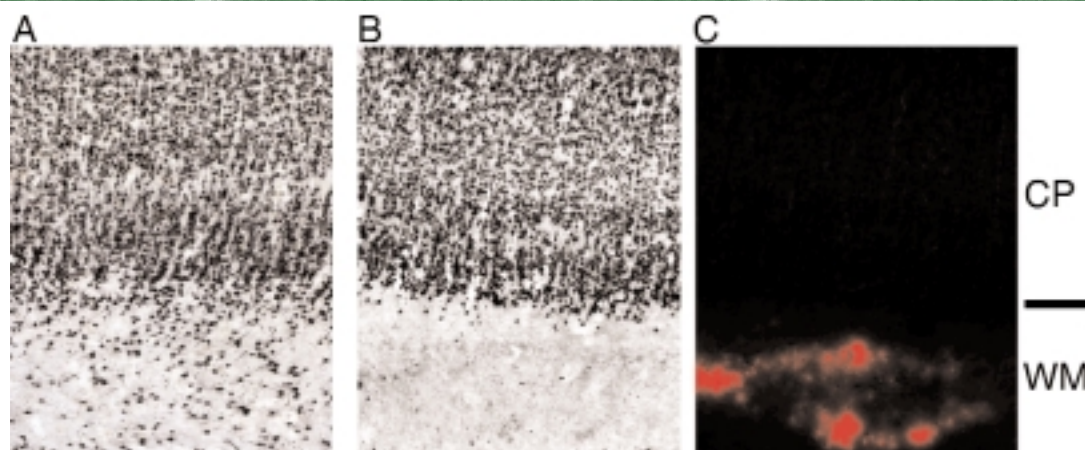


The processing of information in the visual system happens in multiple stages. Retinal neurons in the eye connect to neurons in the lateral geniculate nucleus (LGN), that in turn connect to neurons in the visual cortex. The axonal fibers grow to connect these regions during fetal development. For example, fibers from the LGN grow into visual cortex. Once these LGN axons reach their target area in visual cortex, they start to form synapses with neurons in the area. The axons also start to segregate into the ocular dominance columns (ODCs), stripes of cortex that are connected exclusively to the left eye or to

the right eye. The prevailing hypothesis about the formation of ODCs is that they are shaped by activity-dependent competition between afferents from each eye and by selective growth and pruning of axonal projections as a means of refinement. The factors and circuits mediating the competition remain to be elucidated.

During this period of connecting and remodeling, a peculiar group of neurons is present in the developing brain: the subplate neurons. In contrast to other neuronal structures in the brain, this is a

*(continued on page 6)*



Immunohistochemistry using NeuN (neuron-specific marker) at P21 confirms selective loss of subplate neurons at injection site. Immunotoxin (ME20.4-SAP) was injected into subplate at P7 (1 mg/ml). A: Note the abundance of subplate neurons in the white matter (WM) of the control area of cortex. B: Loss of subplate neurons in white matter after immunotoxin injection. Note the abundance of neurons in the overlying cortical plate (CP). C: Fluorescent microspheres (coinjecting with immunotoxin) in the WM indicating injection site (same section as B).