Targeting Topics: Recent Scientific References

Reviewed by Matthew Kohls

Targeted toxins in pain.
Wiley RG, Lappi DA

The authors discuss the use of 'molecular neurosurgery' in the study of nociception. Applications using targeted toxins, which include immunotoxins, protein-toxin conjugates, or peptide-toxin conjugates, are illustrated. The authors describe the use of these molecules as research tools, as well as their potential for therapeutics. A helpful table is included that lists neuronal surface markers and class of cells targeted for each targeted toxin. Reagents discussed: CTB-SAP (Cat. #IT-14), IB4-SAP (Cat. #IT-10), OX7-SAP (Cat. #IT-02), 192-Saporin (Cat. #IT-01), ME20.4-SAP (Cat. #IT-15), Anti-DBH-SAP (Cat. #IT-03), Anti-DAT-SAP (Cat. #IT-25), SP-SAP (Cat. #IT-07), Dermorphin-SAP (Cat. #IT-12), Orexin-SAP (Cat. #IT-20), CRF-SAP (Cat. #IT-13), and acetylated LDL-SAP (Cat. #IT-08).

Neurokinin-1 receptor-expressing neurons in the amygdala modulate morphine reward and anxiety behaviors in the mouse.
Gadd CA, Murtra P, De Felipe C, Hunt SP
J Neurosci 23(23):8271-8280, 2003

Mice lacking the neurokinin-1 (NK-1) receptor are insensitive to opiates in models of drug abuse. To assess which areas of the brain may be involved in this process, the authors used 1.0-µl injections of 1.0 µM SP-SAP (Cat. #IT-07) to eliminate NK-1 receptor-positive neurons in the nucleus accumbens, dorsomedial caudate putamen or amygdala of mice. Only mice with amygdala lesions displayed behavior comparable to NK-1 receptor knockout mice--increase in anxiety-like behavior, reduction in stimulant effect of morphine. These data suggest that the amygdala plays an important role in anxiety behaviors and the response to opiates.

Behavioral patterns under cholinergic control during development: lessons learned from the selective immunotoxin 192 IgG saporin.
Ricceri L

The author reviews the effects of 192-Saporin (Cat. #IT-01) neonatal lesions (0.42 µg in each hemisphere) on the cholinergic basal forebrain system in rats. Short-term effects are seen in pups in learning tasks, as well as ultrasound vocalizations. Longer term effects are seen in task-specific behaviors. Data suggest that the extent of these effects are linked to the attentional load of the task. The age of the animal when lesioned may also play a role in the extent of the deficits caused by 192-Saporin; studies show that early in the first week of life is a particularly vulnerable period.

Subtypes of substance P receptor immunoreactive interneurons in the rat basolateral amygdala.
Levita L, Mania I, Rainnie DG

SP-SAP (Cat. #IT-07) has been used to lesion substance P receptor (SPr)-expressing neurons in the basolateral amygdala (BLA), but the interneuron subgroups targeted by SP-SAP in the BLA have not yet been defined. The authors used dual-labeling immunofluorescence to examine SPr colocalization with calbindin-D28K, parvalbumin, calretinin, somatostatin, and neuropeptide Y (NPY). All neurons in the BLA that express NPY also express the SPr and therefore SP-SAP, which specifically eliminates SPr receptor-positive neurons is a useful tool to study the role of NPY in the BLA.

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