Targeting Topics: Recent Scientific References

Summarized by Matthew Kohls

Unilateral lesions of the cholinergic basal forebrain and fornix in one hemisphere and inferior temporal cortex in the opposite hemisphere produce severe learning impairments in rhesus monkeys.

Easton A, Ridley RM, Baker HF, Gaffan D
Cereb Cortex 12:729-736, 2002

The authors used a combination of basal forebrain lesioning using ME20.4-SAP (Cat. #IT-15) and surgery to isolate the inferior temporal cortex and medial temporal cortex from cholinergic afferents in rhesus monkeys. Testing of the treated animals demonstrated severe impairments in learning visual scenes and object-reward associations.

Selective lesion of cholinergic neurons in the medial septum by 192 IgG-saporin impairs learning in a delayed matching to position T-maze paradigm.

Johnson DA, Zambon NJ, Gibbs RB
Brain Res 943(1):132-141, 2002

The authors investigated the effects of selective cholinergic depletion in the medial septum on a spatial memory (DMP) task. Direct infusion of 0.22 or 1.0 µg 192-Saporin (Cat. #IT-01) produced a near complete depletion of cholinesterase-positive neurons for either dose. The DMP task provides a sensitive behavioral assay for deficits in cholinergic projections.

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Hippocampal brain-derived neurotrophic factor gene regulation by exercise and the medial septum.

Berchtold NC, Kesslak JP, Cotman CW
J Neurosci Res 68(5):511-521, 2002

Brain-derived neurotrophic factor (BDNF) enhances neuron function and plasticity. The authors lesioned rats with medial septal injections of 192-Saporin (Cat #IT-01, 375 ng in 0.5 µl PBS) or OX7-SAP (Cat #IT-02, 12.5 or 25 ng in 0.5 µl PBS). 192-Saporin affected the sedentary, but not exercise-induced levels of BDNF. OX7-SAP reduced levels in both groups in a dose-dependent manner.

Grafts of fetal septal cells after cholinergic immunotoxic denervation of the hippocampus: a functional dissociation between dorsal and ventral implantation sites.

Cassel JC, Gaurivaud M, Lazarus C, Bertrand F, Galani R, Jeltsch H
Neuroscience 113(4):871-882, 2002

The authors lesioned rats with intraseptal infusions of 0.8 µg 192-Saporin (Cat. #IT-01), then implanted fetal cells in either the dorsal or ventral hippocampus. Only grafts into the dorsal hippocampus counteracted the effect of cholinergic lesions on spatial working memory performance.

Inhibition of neuropathic pain by selective ablation of brainstem medullary cells expressing the µ-opioid receptor.

Porreca F, Burgess SE, Gardell LR, Vanderah TW, Malan TP Jr, Ossipov MH, Lappi DA, Lai J
J Neurosci 21(14):5281-5288, 2001

The presence of descending projections in the pain pathway raises the possibility that abnormal sustained activity may perpetuate chronic pain. Using 3-ng injections of dermorphin-SAP (Cat #IT-12) on either side of the RVM in rats the authors both prevented and reversed neuropathic pain caused by spinal nerve ligation.

Identification of a potential ejaculation generator in the spinal cord.

Truitt WA, Coolen LM
Science 297(5586):1566-1569, 2002
(Also see pp 1460-1461 for News of the Week)

The authors lesioned a specific population of rat spinothalamic neurons using 6-8 injections of 4 ng SSP-SAP (Cat. #IT-11). Whereas the treated rats exhibited no change in sexual behavior such as mounts and intromissions, ejaculatory behavior was completely abolished. The data suggest that this population of neurons may function as an ejaculation generator in the spinal cord.

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