Targeting Topics: Recent Scientific References

(continued from page 3)

authors investigated the effects of 0.05 to 0.075 µg injections of 192-Saporin (Cat. #IT-01) into the medial septum/vertical limb of the diagonal band of rats by measuring corticosterone levels during a restraint stress test. Lesioned rats displayed less stress suppression on the administration of dexamethasone than controls, indicating that cholinergic neurons are involved in these stress responses.

Cognitive and neurological deficits induced by early and prolonged basal forebrain cholinergic hypofunction in rats.

Ricceri L, Minghetti L, Moles A, Popoli P, Confaloni A, De Simone R, Piscopo P, Scattoni ML, di Luca M, Calamandrei G
Exp Neurol 189(1):162-172, 2004.

A distinctive feature of Alzheimer's disease is the loss of cholinergic neurons in the basal forebrain (BF). The authors investigated long-term effects of BF cholinergic lesions on several parameters. Administration of 0.21 µg of 192-Saporin (Cat. #IT-01) to the third ventricle of 7 day-old rats was followed by an evaluation of protein levels and cortical EEG patterns at 6 months of age. The findings indicate that permanent neonatal BF cholinergic damage may provide a model for abnormal adult cholinergic function.

Selective lesioning of the cholinergic septo-hippocampal pathway does not disrupt spatial short-term memory: a comparison with the effects of fimbria-fornix lesions.

Winters BD, Dunnett SB
Behav Neurosci 118(3):546-562, 2004.

The authors wished to investigate the role of the cholinergic system of the basal forebrain in delayed matching (DMTP)- and nonmatching (DNMTP)-to-position tasks after bilateral injections of 0.035 µg of 192-Saporin (Cat. #IT-01) into the dorsal and ventral hippocampus. The treated animals were compared to rats given fimbria-fornix (FF) lesions. Only the FF-lesioned animals showed impairment on DMTP and DNMTP tasks, demonstrating that the cholinergic septohippocampal system is not required for successful DMTP or DNMTP performance.

The effects of cerebellar damage on maze learning in animals.

Lalonde R, Strazielle C
Cerebellum 2(4):300-309, 2003.

Traditionally the cerebellum has been associated with motor control, but recent work has suggested that it plays a role in cognitive functions such as spatial learning as well. This study discusses the effects of cerebellar mutations in mice, and OX7-SAP (Cat. #IT-02) lesions in rats on water maze learning models. Results indicate that the cerebellum plays a role in working memory and the procedural aspect of maze learning, as well as being an important element of motor control.

NADPH oxidase contributes to angiotensin II signaling in the nucleus tractus solitarius.

Wang G, Anrather J, Huang J, Speth RC, Pickel VM, Iadecola C
J Neurosci 24(24):5516-5524, 2004.

Using immunoelectron microscopy the authors investigated whether NADPH oxidase is involved in angiotensin II signaling in central autonomic neurons. Angiotensin type 1 receptor (AT-1r)-expressing neurons were identified with an AT-1r antibody (Cat. #AB-N27AP) from which AT-1Ar (AB-N25AP) and AT-1Br (AB-N26AP) are affinity purified. Colocalization of AT-1r's and a NADPH oxidase subunit provides evidence that NADPH oxidase is involved in the effects of angiotensin II on autonomic neurons.

Minocycline protects basal forebrain cholinergic neurons from mu p75-saporin immunotoxic lesioning.

Hunter CL, Quintero EM, Gilstrap L, Bhat NR, Granholm AC
Eur J Neurosci 19(12):3305-3316, 2004.

In Alzheimer's disease basal cholinergic degeneration is accompanied by glial activation and the release of pro-inflammatory cytokines. To investigate whether neural events other than degeneration can cause effects of Alzheimer's disease, the authors treated mice with minocycline after lesioning the basal forebrain with 3.6 µg of mu p75-SAP (Cat. #IT-16). Administration of minocycline reduced the loss of cholinergic neurons, reduced glial response to the lesion, and lessened the cognitive impairment due to mu p75-SAP lesions.

Decreased neurogenesis after cholinergic forebrain lesion in the adult rat.

Cooper-Kuhn CM, Winkler J, Kuhn HG
J Neurosci Res 77(2):155-165, 2004.

Adult mammalian brains can produce new neurons, mainly in two areas: the interconnected system of the lateral ventricle and the olfactory bulb, and the dentate gyrus of the hippocampus. The authors used a 3.5 µg-injection of 192-Saporin (Cat. #IT-01) into the right ventricle of rats to determine whether cholinergic input is necessary for adult neurogenesis. The results suggest that acetylcholine, a product of cholinergic neurons, is necessary for the survival of newly-formed neurons.

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