

Targeting Topics: Recent Scientific References

Reviewed by Matthew Kohls

Facilitation of cholinergic transmission by combined treatment of ondansetron with flumazenil after cortical cholinergic deafferentation.

Gil-Bea FJ, Dominguez J, Garcia-Alloza M, Marcos B, Lasheras B, Ramirez MJ
Neuropharmacology 47(2):225-232, 2004.

Previous studies from this group demonstrated that 5-HT(3) receptor antagonists potentiated by GABA(A) antagonists increased acetylcholine (ACh) release in the rat cerebral cortex. This series of experiments investigated the effects of these antagonists on rats with 0.067 µg-bilateral infusions of 192-Saporin (Cat. #IT-01) into the nucleus basalis magnocellularis. Even after lesioning with 192-Saporin, rats treated with the 5-HT(3) and GABA(A) receptor antagonists displayed increased ACh release, indicating that these antagonists may have use as treatments for cognitive disorders.

Age-dependent effect of cholinergic lesion on dendritic morphology in rat frontal cortex.

Works SJ, Wilson RE, Wellman CL
Neurobiol Aging 25(7):963-974, 2004.

Aged rats display more dramatic and longer lasting effects due to brain injury than young animals. The authors examined the role cholinergic neurons may play in brain plasticity after injury in rats of varying ages. 0.15 µg of 192-Saporin (Cat. #IT-01) was injected into the nucleus basalis magnocellularis of young, middle-aged, and aged rats. Some types of injury were only seen in middle-aged and aged rats, and changes in dendritic morphology were least marked in the young animals.

Hindbrain catecholamine neurons mediate consummatory responses to glucoprivation.

Hudson B, Ritter S
Physiol Behav 82(2-3):241-250, 2004.

Norepinephrine (NE) and epinephrine (E) neurons appear to potentially stimulate

feeding behavior when administered to the hypothalamus. Previous work has indicated that these neurons play important roles in feeding responses due to glucoprivation. Bilateral 42 ng-injections of anti-DBH-SAP (Cat. #IT-03) were administered to rats to investigate the roles of NE and E neurons in the consummatory phase of the glucoprivic response. The results indicate that catecholaminergic neurons are involved in both appetitive and consummatory responses to glucoprivation.



Loss of cortical acetylcholine enhances amphetamine-induced locomotor activity.

Mattsson A, Pernold K, Ogren SO, Olson L
Neuroscience 127(3):579-591, 2004.

The authors have recently shown that cholinergic denervation of the basal forebrain in rats leads to an increased motor response to d-amphetamine, a hallmark of schizophrenia. In the present study 192-Saporin (Cat. #IT-01) was injected into the nucleus basalis magnocellularis or the medial septum/diagonal band of Broca, and OX7-SAP (Cat. #IT-02) was injected intracerebroventricularly. The dopaminergic hyper-reactivity was induced by lesions to the cortex cerebri, but not by damage to the cerebellum or hippocampus.

Recurrent paraplegia after remyelination of the spinal cord.

Jasmin L, Ohara PT
J Neurosci Res 77(2):277-284, 2004.

Previously, the authors demonstrated that a 3 µg-injection of CTB-SAP (Cat. #IT-14) into the lumbosacral intrathecal space caused a loss of motor function due to spinal demyelination. The motor function was recovered and stable for up to 9 months, after which the rats exhibited a slow deterioration of motor function, loss of spinal white matter, and the appearance of calcium deposits. The results indicate that the CTB-SAP-induced demyelination model is useful for investigating long term effects of axon and motoneuron loss.

Sound sequence discrimination learning is dependent on cholinergic inputs to the rat auditory cortex.

Kudoh M, Seki K, Shibuki K
Neurosci Res 50(1):113-123, 2004.

The auditory cortex (AC) is thought to play a role in the discrimination of sound sequences. The authors investigated the role of cholinergic inputs to the AC in processing these sequences by injecting 5 µg of 192-Saporin (Cat. #IT-01) into either the lateral ventricle or bilateral AC of rats. Treated animals displayed suppressed sound discrimination learning, but discrimination between two sound components was unaffected. The results suggest that cholinergic neurons in the AC are highly involved in sound sequence learning.

Habituation to stress and dexamethasone suppression in rats with selective basal forebrain cholinergic lesions.

Helm KA, Ziegler DR, Gallagher M
Hippocampus 14(5):628-635, 2004.

Basal forebrain cholinergic neurons may be involved in hippocampal and medial prefrontal cortex inhibition of glucocorticoid stress responses. The

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