Targeting Topics: Recent Scientific References

Reviewed by Matthew Kohls

Relationship between CSF hypocretin levels and hypocretin neuronal loss.

Gerashchenko D, Murillo-Rodriguez E, Lin L, Xu M, Hallett L, Nishino S, Mignot E, Shiromani PJ *Exp Neurol* 184(2):1010-1016, 2003

Narcolepsy has recently been shown to be a neurodegenerative disease. Data from several different sources indicate that narcoleptics have very low levels of hypocretin (HCRT)-containing neurons. The authors sought to verify a direct linkage between HCRT-containing neurons and HCRT levels in the CSF. Rats were lesioned with 45-90 ng of orexin-SAP (Cat. #IT-20) bilaterally into the lateral hypothalamus. Loss of HCRT neurons correlated with decreased levels of HCRT in the CSF.

Cholinergic modulation of visual attention and working memory: Dissociable effects of basal forebrain 192-IgG-saporin lesions and intraprefrontal infusions of scopolamine.

Chudasama Y, Dalley JW, Nathwani F, Bouger P, Robbins TW *Learn Mem* 11(1):78-86, 2004

It is hypothesized that cortical cholinergic dysfunction underlies the cognitive impairments associated with dementia and normal aging. The authors examined the role of these neurons in both attentional and mnemonic functions, using either bilateral infusions of 125 ng of 192-Saporin (Cat. #IT-01) into the bregma of rats or infusions of scopolamine. The results suggest that attentional and working memory capacities can be tested separately during the same session. It is also indicated that the CBF system is a modulator of both attentional and mnemonic processing.

Please visit our www.ATSbio.com to see a complete list of references. Selective cholinergic denervation of the cingulate cortex impairs the acquisition and performance of a conditional visual discrimination in rats.

Winters BD, Robbins TW, Everitt BJ Eur J Neurosci 19(2):490-496, 2004

Performance in conditional discrimination tasks is thought to be controlled at least in part by the cingulate cortex and its basal forebrain afferents. Using bilateral 0.5 µl injections of 0.02 µg/ml 192-Saporin (Cat. #IT-01) into the cingulate cortex of rats, the authors investigated the role of cholinergic projections from the vertical limb nucleus of the diagonal band to the cingulate cortex in specific types of learning. The results reinforce the idea that cholinergic projections to the cortex are involved in processing sensory information as well as task-related stimuli.



Medullary serotonergic neurons and adjacent neurons that express neurokinin-1 receptors are both involved in chemoreception in vivo. Nattie EE, Li A, Richerson GB, Lappi DA *J Physiol* Apr 1;556(Pt 1):235-253, 2004

The retrotrapezoid nucleus contains neurokinin-1 receptor (NK-1r)expressing neurons that are involved in chemoreception. NK-1r-expressing neurons are also present in areas that contain medullary serotonergic neurons. These serotonergic neurons have been shown to be chemosensitive *in vitro*. With two 100-nl injections of 1 μ M SP-SAP (Cat. #IT-07), anti-SERT-SAP (Cat. #IT-23), or both, the authors examined whether both cell populations are involved in chemoreception *in vivo* in rats. The results support that separate populations of serotonergic and NK-1rexpressing neurons are each involved in chemoreception *in vivo*.

Testosterone manipulation protects motoneurons from dendritic atrophy after contralateral motoneuron depletion. Fargo KN, Sengelaub DR

J Comp Neurol 469(1):96-106, 2004

The authors wished to investigate the therapeutic effects of testosterone on motoneuron dendrites in nerve injury models. 1 µl of a 0.1% solution of CTB-SAP (Cat. #IT-14) solution was unilaterally injected into the ispilateral bulbocavernosus and levator ani muscles of rats, and the contralateral motoneuron morphology was examined. In castrated rats receiving testosterone, dendrites in the spinal nucleus of the bulbocavernosus grew after CTB-SAP treatment. This is a demonstration of the neuroprotective/neurotherapeutic role of testosterone in the nervous system.

Increased calcium influx and ribosomal content correlate with resistance to endoplasmic reticulum stress-induced cell death in mutant leukemia cell lines. Zhang Y, Berger SA J Biol Chem 279(8):6507-6516, 2004

Ca²⁺ plays a vital role in many cell processes. To investigate events associated with Ca²⁺ and endoplasmic reticulum (ER) stress-induced cell death, the authors developed a mutant cell line with resistance to several ER stressinducing agents. One of the assays used to define the characteristics of this cell line was treatment of the cells with

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