Targeting Topics: Recent Scientific References

(continued from page 3)

Segregated populations of hippocampal principal CA1 neurons mediating conditioning and extinction of contextual fear

Tronson NC, Schrick C, Guzman YF, Huh KH, Srivastava DP, Penzes P, Guedea AL, Gao C, Radulovic J
J Neurosci 29(11):3387-3394, 2009.

This work examines what cell groups are responsible for controlling contextual fear. 180 ng of mu p75-SAP (Cat. #IT-16) was injected into the medial septum of mice. Saporin (Cat. #PR-01) was used as a control. In lesioned animals, fear extinction was lost along with the cholinergic input from the medial septum, while fear conditioning was left intact.

Cardiac damage after lesions of the nucleus tractus solitarii

Nayate A, Moore SA, Weiss R, Taktakishvili OM, Lin LH, Talman WT
Am J Physiol Regul Integr Comp Physiol 296(2):R272-279, 2009.

This work tested the hypothesis that nucleus tractus solitarii (NTS) lesions can lead to fatal cardiac arrhythmias and myocardial lesions. Rats received bilateral injections of 9.4 ng of SSP-SAP (Cat. #IT-11) into the dorsolateral and medial portions of the NTS. Lesioned animals displayed increased arterial blood pressure.

Neuroprotective effects of testosterone on the morphology and function of somatic motoneurons following the death of neighboring motoneurons

Little CM, Coons KD, Sengelaub DR
J Comp Neurol 512(3):359-372, 2009.

Atrophy of androgen-sensitive motoneurons due to proximity to damaged motoneurons can be attenuated by testosterone. This work examined whether typical motoneurons respond in the same way. Rats received 5-ng injections of CTB-SAP (Cat. #IT-14) that eliminated motoneurons innervating the vastus medialis muscle. Partial motoneuron depletion resulted in atrophy of the remaining quadriceps motoneurons; this was attenuated by the administration of testosterone.

Noradrenergic, but not cholinergic, deafferentation of prefrontal cortex impairs attentional set-shifting

McGaughy J, Ross RS, Eichenbaum H
Neuroscience 153(1):63-71, 2008.

Norepinephrine and acetylcholine are involved in the mediation of attention, however, it is not yet clear whether the roles of these molecules are unique. This work utilizes a specific task shown to dissociate the roles played by the dorsolateral prefrontal cortex and the orbitofrontal cortex in primates. Rats received 5-ng infusions of anti-DBH-SAP (Cat. #IT-03) or 192-IgG-SAP (Cat. #IT-01) into each hemisphere. The type of lesion had an effect on attentional shifts and reaction to irrelevant stimuli.

Sex differences in micro-opioid receptor expression in the rat midbrain periaqueductal gray are essential for eliciting sex differences in morphine analgesia

Loyd DR, Wang X, Murphy AZ
J Neurosci 28(52):14007-14017, 2008.

The authors test whether the periaqueductal gray (PAG), that contains a dense population of μ-opioid receptor (MOR)-expressing neurons, is sexually dimorphic. Rats were injected with 3 pmol of Dermorphin-SAP (Cat. #IT-12) into the PAG. Blank-SAP (Cat. #IT-21) was used as a control. Both behavioral and immunohistochemical evidence suggest that differential expression of MOR-expressing neurons in the PAG between male and female rats accounts for the difference in response to morphine.

Anxiety-like behavior is modulated by a discrete subpopulation of interneurons in the basolateral amygdala

Truitt WA, Johnson PL, Dietrich AD, Fitz SD, Shekhar A
Neuroscience [Epub], 2009.

It is thought that the basolateral nucleus of the amygdala (BL) is an anxiety regulator. The authors previously demonstrated that SSP-SAP (Cat. #IT-11) lesions of the BL increase anxiety-like behaviors in rats. Using a series of 6 bilateral injections of SSP-SAP (4 ng per injection), the NK-1 receptor-expressing cells of the BL are further characterized.

Neural regulation of ejaculation

Young B, Coolen L, McKenna K
J Sex Med 6 Suppl 3(229-233, 2009.

This review summarizes that a specific population of lumbar spinothalamic (LSt) cells plays in regulation of the ejaculatory response. One method to study these cells is the injection of SSP-SAP (Cat. #IT-11) into the LSt cells surrounding the central canal. Over 90% of these cells express the NK-1 receptor. This lesion significantly disrupts ejaculation without affecting mounts or intromissions.

Targeted ablation of cardiac sympathetic neurons reduces resting, reflex, and exercise-induced sympathetic activation in conscious rats

Lujan HL, Palani G, Chen Y, Peduzzi-Nelson J, DiCarlo SE
Am J Heart Circ Physiol
doi:10.1152/ajpheart.00095.2009

This work examines the capability of CTB-SAP (Cat. #IT-14) to eliminate cardiac sympathetic neurons. The right and left stellate ganglia of rats were each injected with 10 μg of CTB-SAP. Lesioned animals displayed physiological differences from controls, as well as specific reduction of numbers of neurons in the stellate ganglion and spinal cord.