Targeting Topics: Recent Scientific References

Reviewed by Matthew Kohls

Hypotensive hypovolemia and hypoglycemia activate different hindbrain catecholamine neurons with projections to the hypothalamus.

Dinh TT, Flynn FW, Ritter S
Am J Physiol Regul Integr Comp Physiol [Epub May 4], 2006.

Hypovolemia, a decrease in blood plasma volume, results in secretion of arginine vasopressin (AVP). This work investigates the role of hindbrain catecholamine neurons in hypovolemia-induced AVP secretion. Rats were treated with bilateral 42 ng injections of anti-DBH-SAP (Cat. #IT-03) into the paraventricular nucleus of the hypothalamus, and hypovolemia was induced by blood withdrawal. Treated animals displayed severely impaired AVP response, as well as lower food intake and corticosterone secretion in response to insulin.

Aversive stimulus attenuates impairment of acquisition in a delayed match to position T-maze task caused by a selective lesion of septo-hippocampal cholinergic projections.

Fitz NF, Gibbs RB, Johnson DA
Brain Res Bull 69(6):660-665, 2006.

It is known that infusion of 192-IgG-SAP (Cat. #IT-01) into the medial septum of rats impairs acquisition of a delayed matching to position (DMP) T-maze task. Here, the authors evaluated whether introduction of an aversive stimulus 30 minutes prior to training would attenuate this deficit. Treated rats received 0.22 μg of 192-IgG-SAP injected into the medial septum. Data indicate that treated rats receiving an intraperitoneal injection of saline 30 minutes prior to training displayed

less impairment than rats not receiving the aversive stimulus.

Toward better pain control.

Basbaum AI, Julius D
Sci Am 294(6):60-67, 2006.

The authors discuss some of the advances in understanding and treating different types of pain, and specifically outline circuits, receptors, and ligands involved in pain pathways. Several treatments are described, one of which is the use of SP-SAP (Cat. #IT-07) to disrupt the chronic pain pathway in the spinal cord.

Differential responsiveness of dopamine-beta-hydroxylase gene expression to glucoprivation in different catecholamine cell groups.

Li AJ, Wang Q, Ritter S
Endocrinology [Epub Apr 13], 2006.

This work examines how subpopulations of hindbrain catecholaminergic neurons participate in systemic glucoregulation. Rats were treated with bilateral 42 ng infusions of anti-DBH-SAP (Cat. #IT-03) into the paraventricular nucleus of the hypothalamus. Dopamine-beta-hydroxylase (DBH) expression in glucoprivic animals was then analyzed by *in situ* hybridization and immunohistochemistry. The data demonstrate that the ventrolateral medulla contains most of the catecholamine neurons responsive to glucoprivation.

Attenuation of homeostatic responses to hypotension and glucoprivation after destruction of catecholaminergic rostral ventrolateral medulla (RVLM) neurons.

Madden CJ, Stocker SD, Sved AF
Am J Physiol Regul Integr Comp Physiol [Epub Apr 20], 2006.

C1 neurons in the RVLM express dopamine-beta-hydroxylase (DBH). Anti-DBH-SAP (Cat. #IT-03) was used to eliminate these neurons and examine cardiovascular homeostasis in response to a physiological challenge such as hypotension. 21 ng of anti-DBH-SAP was injected into the RVLM of rats. After food and water had been removed from the cage, the lesioned animals were treated with hydralazine to reduce blood pressure. The results demonstrate that RVLM-C1 cells are involved in responses to homeostatic challenges.

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