Targeting Topics: Recent Scientific References

(continued from page 3)

synchronized by the suprachiasmatic nuclei (SCN) in the brain. The local clock found in the retina does not require rods, cones, intrinsically photosensitive retinal ganglion cells, or the SCN. In order to determine what photopigments are responsible for local retinal photoentrainment, the authors used a candidate gene approach. For immunohistochemical studies on flat mount retinas they used a melanopsin antibody (Cat. #AB-N38) at a 1:1000 dilution. The data indicate that OPN5, also known as neuropsin, has a light-sensing function and is involved in retinal photoentrainment.

Retrograde transport is not required for cytosolic translocation of the B-subunit of Shiga toxin.

Garcia-Castillo MD, Tran T, Bobard A, Renard HF, Rathjen SJ, Dransart E, Stechmann B, Lamaze C, Lord M, Cintrat JC, Enninga J, Tartour E, Johannes L.

J Cell Sci 128(13):2373-2387, 2015.

Bacterial and plant toxins rely on various trafficking pathways to reach intracellular targets. Shiga and Shiga-like toxins have been found to be moved via vesicular transport through several subcellular structures on the way to the cytosol. Shiga toxin (STx) is the cause of hemolytic uremic syndrome, for which there is no effective treatment. In order to better understand the mechanisms of STx membrane translocation the authors used a custom conjugate of the receptor-binding B-subunit of STx (STxB) and saporin (Custom conjugation provided by Advanced Targeting Systems). *In vitro* assays demonstrated that STxB-SAP did not use retrograde transport to the Golgi complex in order to reach the cytosol. This information has relevance to antigen cross-presentation of antigen-presenting cells.

Catecholaminergic neurons projecting to the paraventricular nucleus of the hypothalamus are essential for cardiorespiratory adjustments to hypoxia.

King TL, Ruyle BC, Kline DD, Heesch CM, Hasser EM.

Am J Physiol Regul Integr Comp Physiol Epub2015.

Catecholaminergic neurons in the brainstem are known to be involved in cardiorespiratory control and to modulate sensory function. Some of the projections from these neurons are to the paraventricular nucleus (PVN), and are involved in cardiorespiratory and neuroendocrine responses to hypoxia. While data have shown the PVN-projecting neurons are activated by hypoxia, their function in this context is not known. In this work the authors bilaterally injected 42 ng of Anti-DBH-SAP (Cat. #IT-03) into the PVN of rats. Mouse IgG-SAP (Cat. #IT-18) was used as control. Respiratory measurements of the lesioned animals indicates that PVN-projecting catecholaminergic neurons are involved in peripheral and central chemoreflex and arterial oxygen levels during exposure to hypoxic stimuli.

Catecholaminergic neurons in the comissural region of the nucleus of the solitary tract modulate hyperosmolality-induced responses.

Freiria-Oliveira AH, Blanch GT, Pedrino GR, Cravo SL, Murphy D, Menani JV, Colombari DS.

Am J Physiol Regul Integr Comp Physiol Epub2015.

Body fluid homeostasis and cardiovascular regulation are thought to be at least in part controlled by noradrenergic A2 neurons found in the nucleus of the solitary tract (NTS). In this work the authors investigated the involvement of A2 neurons of the commissural NTS in arterial pressure, as well as several body fluid homeostasis parameters. Rats received 12.6-ng injections of Anti-DBH-SAP (Cat. #IT-03) into the commissural NTS. Mouse IgG-SAP (Cat. #IT-18) was used as a control. Lesioned animals displayed increased c-Fos expression in the hypothalamic paraventricular nucleus when treated with hypertonic NaCl, and increased arterial pressure. The data indicate that commissural NTS A2 neurons are essential for inhibitory mechanisms that reduce water intake and pressor response to an acute increase in plasma osmolality.

Limited changes in spinal lamina I dorsal horn neurons following the cytotoxic ablation of non-peptidergic C-fibers.

Saeed AW, Pawlowski SA, Ribeiro-da-Silva A.

Mol Pain 11(1):54, 2015.

For the most part nociceptive information is moved from the periphery to the spinal cord through small diameter primary afferents. One subclass of these afferents is further divided into peptidergic and non-peptidergic populations. The authors examined the role of the non-peptidergic afferents in normal nociception and pain, especially the aspect that in rat neuropathic and inflammatory pain models there is novel expression of neurokinin-1 receptors in some neurons normally devoid of this protein. Rats received 4.8-µg injections of rIB4-SAP (Cat. #IT-10) into the left sciatic nerve, over three injection sites. While the number of non-peptidergic neurons was significantly reduced, de novo expression of the neurokinin-1 receptor was not increased in lamina I pyramidal projection neurons.

Selective elimination of isolectin B4-binding trigeminal neurons enhanced formalin-induced nocifensive behavior in the upper lip of rats and c-Fos expression in the trigeminal subnucleus caudalis.

Oyamaguchi A, Abe T, Sugiyo S, Niwa H, Takemura M.

Neurosci Res Epub2015.

In adult rats non-peptidergic neurons and peptidergic neurons innervate different areas and layers of the lamina. It is thought that these two neuronal populations play different roles in nociceptive processing, but the specific function of each group is not well understood. In order to investigate peptidergic and non-peptidergic neurons in orofacial pain processing the authors injected the cisterna magna of rats with 2.9 µg of rIB4-SAP (Cat. #IT-10). Blank-SAP (Cat. #IT-21) was used as a control. The lesioned

Don't see your publication here? Send us a PDF at ats@ATSbio.com and we'll be sure to review it in our next issue.

(continued on page 5)