Targeting Topics: Recent Scientific References

(continued from page 3)

used as a control. The results indicate that the 5-HT pathway contacting the CSF is an important piece in the descending inhibitory system controlling spinal transmission of pain.

cGMP-dependent protein kinase 1-alpha associates with the antidepressant-sensitive serotonin transporter and dictates rapid modulation of serotonin uptake.

Steiner JA CAMD, Wright J, Mattheis HJF, Prasad HC, Nickl CK, Dostmann WR, Cuchanan CC, Corbin JD, Francis SH, Blakely RD.

Molecular Brain Epub2014.

The neurotransmitter serotonin fulfills an important modulatory role in a wide range of brain functions including mood, appetite, sexual behavior, and reward. Serotonin transporters (SERT) are involved in the inactivation of synaptic serotonin, as well as serotonin recycling, which is critical to the maintenance of neuronal serotonin stores. In this work the authors examined how neuronal A3 adenosine receptor activation can enhance presynaptic serotonin transport *in vitro* as well as SERT-mediated clearance *in vivo*. The *in vitro* experiments included immunohistochemistry with anti-SERT (Cat. #AB-N40) on RN46A cells at a 1:500 dilution.

GABAergic neurons in the medial septum-diagonal band of Broca (MSDB) are important for acquisition of the classically conditioned eyeblink response.

Roland JJ, Janke KL, Servatius RJ, Pang KC.

Brain Struct Funct 219(4):1231-1237, 2014.

The medial septum and vertical limb of the diagonal band of Broca (MSDB) are both important for learning and memory. There are strong connections between these two areas, and damage to one or the other can result in differing dysfunctions. The authors investigated how damage to GABAergic neurons in the MSDB affect acquisition of delay classical conditioning of the eyeblink response (CCER). Rats received 162 ng of GAT-1-SAP (Cat. #IT-32) into the medial septum and 130 ng of GAT-1-SAP into each diagonal band. Treated animals displayed impaired initial acquisition of the eyeblink response, indicating that MSDB GABAergic neurons modulate delay CCER – a task that is not dependent on the hippocampus.

Immunohistochemical Localization of AT1a, AT1b, and AT2 Angiotensin II Receptor Subtypes in the Rat Adrenal, Pituitary, and Brain with a Perspective Commentary.

Premer C, Lamondin C, Mitzey A, Speth RC, Brownfield MS.

Int J Hypertens 2013:175428, 2013.

Angiotensin II is a peptide involved in blood pressure, thirst, and sodium appetite in the brain. It also stimulates aldosterone secretion from the adrenal zona glomerulosa and epinephrine secretion from the adrenal medulla. In order to differentiate between the 3 receptor subtypes for this peptide, subtype-specific antibodies were generated for the AT-1Ar (Cat. #AB-N25AP), AT-1Br (Cat. #AB-N26AP), and AT-2r (AB-N28AP). The antibodies were used in western blotting at a 1:500 dilution, immunohistochemistry (AB-N25AP and AB-N26AP at 1:500, AB-N28AP at 1:2000), and immunoelectron microscopy (at a 1:500 dilution). The results demonstrate that these antibodies are well suited to delineate between angiotensin II receptor subtypes in the brain.

Targeted damage of the cerebrospinal fluid-contacting nucleus contributes to the pain behavior and the expression of 5-HT and c-Fos in the spinal dorsal horn of rats.

Cao J WT, Zhang LC.

Zhongguo Ying Yong Sheng Li Xue Za Zhi 30(3):218-222, 2014. [Article in Chinese]

Pain threshold, 5-hydroxytryptamine (5-HT) expression, and c-Fos expression were measured in rats after treatment with CTB-SAP (Cat. #IT-14). Use of CTB-SAP reduced the number of neurons in the cerebrospinal fluid (CSF)-contacting nucleus over time until no neurons could be detected by the 10th day post-injection. 5-HT and c-Fos expression in the spinal dorsal horn gradually increased, and was negatively correlated with the pain threshold. The data indicate that neurons in the CSF-contacting nucleus are involved in pain regulation, and that expression of 5-HT and c-Fos is part of this regulatory pathway.

Recent Articles using Streptavidin-ZAP (Cat. #IT-27)

Alonso MN, Gregorio JG, Davidson MG, Gonzalez JC, Engleman EG. (2014) Depletion of inflammatory dendritic cells with anti-CD209 conjugated to saporin toxin. *Immunol Res* 58(2-3):374-377.

Lund K, Bostad M, Skarpen E, Braunagel M, Krauss S, Duncan A, Hogset A, Selbo P. (2014) The novel EpCAM-targeting monoclonal antibody 3-17I linked to saporin is highly cytotoxic after photochemical internalization in breast, pancreas and colon cancer cell lines. *MAbs* 6(4):1038-50.

Burgos-Ojeda D, McLean K, Bai S, Pulaski H, Gong Y, Silva I, Skorecki K, Tzukerman M, Buckanovich RJ. (2013) A Novel Model for Evaluating Therapies Targeting Human Tumor Vasculature and Human Cancer Stem-like Cells. *Cancer Res* 73(12):3555-3565.

Bostad M, Berg K, Hogset A, Skarpen E, Stenmark H, Selbo PK. (2013) Photochemical internalization (PCI) of immunotoxins targeting CD133 is specific and highly potent at femtomolar levels in cells with cancer stem cell properties. *J Control Release* 168(3):317-326.

Hess SM, Young EF, Miller KR, Vincent BG, Buntzman AS, Collins EJ, Frelinger JA, Hess PR. (2013) Deletion of naive T cells recognizing the minor histocompatibility antigen HY with toxin-coupled peptide-MHC class I tetramers inhibits cognate CTL responses and alters immunodominance. *Transpl Immunol* 29(1-4):138-145.

Ren C, Luan L, Wui-Man Lau B, Huang X, Yang J, Zhou Y, Wu X, Gao J, Pickard GE, So KF, Pu M. (2013) Direct Retino-Raphe Projection Alters Serotonergic Tone and Affective Behavior. *Neuropsychopharmacol* 38(7):1163-1175.

Stratford EW, Bostad M, Castro R, Skarpen E, Berg K, Hogset A, Myklebost O, Selbo PK. (2013) Photochemical internalization of CD133-targeting immunotoxins efficiently depletes sarcoma cells with stem-like properties and reduces tumorigenicity. *Biochim Biophys Acta* 1830(8):4235-4243.

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