Targeting Topics: Recent Scientific References

Summarized by Matthew Kohls

Up-regulation of growth-associated protein 43 mRNA in rat medial septum neurons axotomized by fimbria-fornix transection

Haas CA, Hollerbach E, Deller T, Naumann T, Frotscher M
Eur J Neurosci 12:4233-4242, 2000.

Axonal growth and regeneration is limited in adult mammals, however if injured CNS neurons are in an environment permissive for growth, they can regenerate. Transection of septohippocampal fibers is a widely used method for studying CNS neuron response to injury. These fibers are composed of both cholinergic and GABAergic neurons. Haas *et al.* used a combination of cholinergic lesioning by 192-Saporin (Cat. #IT-01) and double staining to investigate whether both cell types were involved in neuron regeneration. The findings show that both transmitter phenotypes up-regulate mRNA levels of a protein associated with growth and synaptogenesis in developing neurons, and plasticity in adult neurons.

Baroreceptor sensitivity of rat supraoptic vasopressin neurons involves noncholinergic neurons in the DBB

Grindstaff RJ, Grindstaff RR, Cunningham JT
Am J Physiol Regul Integrative Comp Physiol 279:R1934-R1943, 2000.

Baroreceptors are one component of the system that buffers acute changes in blood pressure. Part of this control stems from the baroreceptor ability to regulate vasopressin release from the neurohypophysis. Using 192-Saporin (Cat. # IT-01) to specifically eliminate cholinergic neurons in the diagonal band of Broca, Grindstaff *et al.* demonstrated that these neurons are not utilized in the pathway that relays baroreceptor information to the brain.

Dissociation of memory and anxiety in a repeated elevated plus maze paradigm: Forebrain cholinergic mechanisms

Lamprea MR, Cardenas FP, Silveira R, Morato S, Walsh TJ
Behav Brain Res 117:97-105, 2000.

The septo-hippocampal pathway has been implicated in many behavioral processes such as learning, anxiety, and motivation. Using 192-Saporin (Cat. #IT-01) to lesion the cholinergic neurons of the medial septum of rats, the authors demonstrate changes in exploratory behavior associated with learning, but no changes in anxiety-associated behavior in their elevated plus maze paradigm.*

** Dr. Thomas J. Walsh, who recently passed away, will be remembered, among many other things, for his contributions to science. The next issue of Targeting Trends will feature Dr. Walsh's contributions to the field of targeting.*

Early migratory rat neural crest cells express functional gap junctions: Evidence that neural crest cell survival requires gap junction function

Bannerman P, Nichols W, Puhalla S, Oliver T, Berman M, Pleasure D
J Neurosci Res 61:605-615, 2000.

Gap junctions are vital for intercellular communication, especially during development. Neural crest cells develop into several types of neural cells, often migrating as a mass of cells to their final destinations. Bannerman *et al.* use the anti-p75 antibody (catalog #AB-N01) to confirm the presence of p75 in neural crest cells. The authors examine how crucial survival signals are communicated during migration and demonstrate that interfering with gap junction formation causes death of neural crest cells.

The molecular dynamics of pain control

Hunt SP, Mantyh PW
Nature Rev/Neurosci 2:83-91, 2000.

Over the last twenty years a great deal of progress has been made in the understanding of how pain is processed and transmitted by the CNS. The authors of this review highlight advances in systems neurobiology, behavioral analysis, genetics, and cell and molecular techniques. One method discussed is the use of the targeted toxin substance P-saporin (SP-SAP, Cat. # IT-07, also available with a more stable analog of substance P, SSP-SAP, Cat. # IT-11). This targeted toxin selectively lesions neurons expressing the NK1 receptor. Injection of SP-SAP into the spinal cord of rats dramatically attenuates the response to chronic pain stimuli, yet leaves acute pain response intact.

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