

# Targeting Topics: Recent Scientific References

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magnocellular preoptic area. The results indicate that cholinergic neurons in the BF are important for regulating the biochemical and EEG mechanisms that contribute to HSP.

## Eye-specific retinogeniculate segregation proceeds normally following disruption of patterned spontaneous retinal activity.

Speer CM, Sun C, Liets LC, Stafford BK, Chapman B, Cheng HJ.

*Neural Dev* 9(1):25, 2014.

The authors administered 0.88-1.66  $\mu$ g of an Anti-VaChT-SAP custom conjugate to ferrets with an intraocular injection. Although the lesioned animals demonstrated normal eye-specific retinogeniculate development, there were significant abnormalities in spontaneous retinal activity. These differences in activity manifested themselves as eye-specific segregation defects.

## Role of spinal bombesin-responsive neurons in nonhistaminergic itch.

Akiyama T, Tominaga M, Takamori K, Carstens MI, Carstens E.

*J Neurophysiol* 112(9):2283-2289, 2014.

Recent papers have demonstrated that pruritogen-evoked scratching behavior is reduced or eliminated by intrathecal injection of Bombesin-SAP (Cat. #IT-40). In this work the authors build on those data by investigating if spinal neurons that are responsive to pruritogens administered intradermally are also responsive to a spinal infusion of bombesin. Through the use of intradermal chloroquine injections, spinal superfusion of bombesin, and noxious pinch, the overlap of neurons processing itch and nociception was examined. The results demonstrate that chloroquine- and bombesin-sensitive neurons are involved in the transmission of itch, and that these are a separate neuronal population from those involved in nociception.

## Efficient elimination of CD103-expressing cells by anti-CD103 antibody drug conjugates in immunocompetent mice.

Mang Y, Zhao Z, Zeng Z, Wu X, Li Z, Zhang L.  
*Int Immunopharmacol* 24(1):119-127, 2015.

Previous work has demonstrated that a custom M290-SAP conjugate promoted the long-term survival of pancreatic islet allografts by reducing the number of CD103+ cells. M290 is an antibody that targets CD103. Systemic use of the saporin conjugate can result in toxicity and bystander effects to the animal. In this work the authors used M290 conjugated to three different cytotoxic agents in order to avoid these bystander effects. The various reagents were compared in several assays, including internalization studies, flow cytometry, and cytotoxicity studies. The results indicate that the alternative cytotoxic drugs can be used systemically with M290 to eliminate CD103+ cells.



## Improvements in memory after medial septum stimulation are associated with changes in hippocampal cholinergic activity and neurogenesis.

Jeong da U, Lee JE, Lee SE, Chang WS, Kim SJ, Chang JW.

*Biomed Res Int* 2014:568587, 2014.

Deep brain stimulation (DBS) is a technique by which electrical impulses are applied to specific areas of the brain as therapy for various disorders. In this work the authors examined the mechanisms by which DBS can treat dementia. Rats received 5.04  $\mu$ g intracerebroventricular injections of 192-IgG-SAP (Cat. #IT-01); some rats also received an electrode implanted into the medial septum. Lesioned animals displayed deficits in water maze testing – this deficit was eliminated for the group that received electrical stimulation to the medial septum. The stimulated group

also displayed an increase in hippocampal cholinergic activity as well as neurogenesis, indicating that DBS has therapeutic potential.

## NK1-receptor-expressing paraventricular nucleus neurones modulate daily variation in heart rate and stress-induced changes in heart rate variability.

Feetham CH, Barrett-Jolley R.

*Physiol Rep* 2(12):e12207, 2014.

Neurons in the paraventricular nucleus (PVN) project to the medulla and spinal cord, regulating heart rate and blood pressure. Although the activity of these neurons becomes elevated during heart failure, their role in overall cardiovascular control is unclear. The authors lesioned the PVN of rats with 2 ng injections of SSP-SAP (Cat. #IT-11). Heart rate variability during the experiment was measured using a high/low frequency ratio in response to psychological stress. The variability response of lesioned rats was lower than that of controls, and a shift in daily heart rate variation was seen as well. The authors conclude that neurokinin-1 expressing neurons in the PVN couple the cardiovascular system to the daily heart rate as well as the sympathetic response to psychological stress.

## Targeted Toxin-Based Selectable Drug-Free Enrichment of Mammalian Cells with High Transgene Expression.

Sato M, Akasaka E, Saitoh I, Ohtsuka M, Nakamura S, Sakurai T, Watanabe S.

*Biology* 2(1):341-355, 2013.

Cell transfection is a powerful tool for evaluation of function and expression of newly discovered genes as well as for both small and large scale eukaryotic expression of proteins. Most transfection strategies require a selection agent to eliminate cells that do not internalize the plasmid containing the gene of interest. Subsequent maintenance of the transfected cells requires the presence of the selection agent, and the expression levels of the gene of interest have to be evaluated on a cell by cell basis. In this work the authors designed a system utilizing 50  $\mu$ g/ml rIB4-SAP (Cat. #IT-10) to eliminate non-transfected cells and select for strong expression of the gene of interest. The data demonstrate that this technique will generate stable transfected cells that express the gene of interest at high levels.

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