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Targeting Trends

Reporting the latest news in Molecular Surgery

Striatal patch compartment lesions reduce cocaine-induced repetitive behaviors

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Repeated exposure to psychostimulants, such as cocaine, can result in patterns of repetitive, inflexible behaviors, known as stereotypy.[1,2] These inflexible behaviors are thought to be similar to the type of behaviors observed with certain psychiatric disorders, such as Tourette syndrome and obsessive-compulsive disorder.[3] Stereotypic behavior has been associated with enhanced activation of the patch compartment of striatum, relative to the surrounding matrix compartment.[1,2] The striatum is a component of the basal ganglia that is important for the initiation of voluntary movement based on the appropriate environmental context. Enhanced activation of the limbic-associated patch compartment within the striatum may result in the perpetuation of behaviors that are driven by internal emotional states. This occurs at the expense of normal adaptive behavioral responses that may be mediated by the matrix compartment which surrounds the patch compartment.[1,3] The functional role of the patch compartment in the development of these types of behaviors has not been previously investigated. Thus, we sought to determine the contribution of the neurons of the patch compartment to the emergence of stereotypy induced by psychostimulant exposure, by lesioning the patch compartment with Dermorphin-SAP (Cat. #IT-12) prior to treatment with repeated, high doses of cocaine.

Mu opioid receptors are densely expressed by the neurons of the patch compartment, while the neurons of the matrix compartment contain relatively few mu opioid receptors.[4,5] Thus, internalization of the Dermorphin-Saporin complex ultimately leads to the destruction of the mu

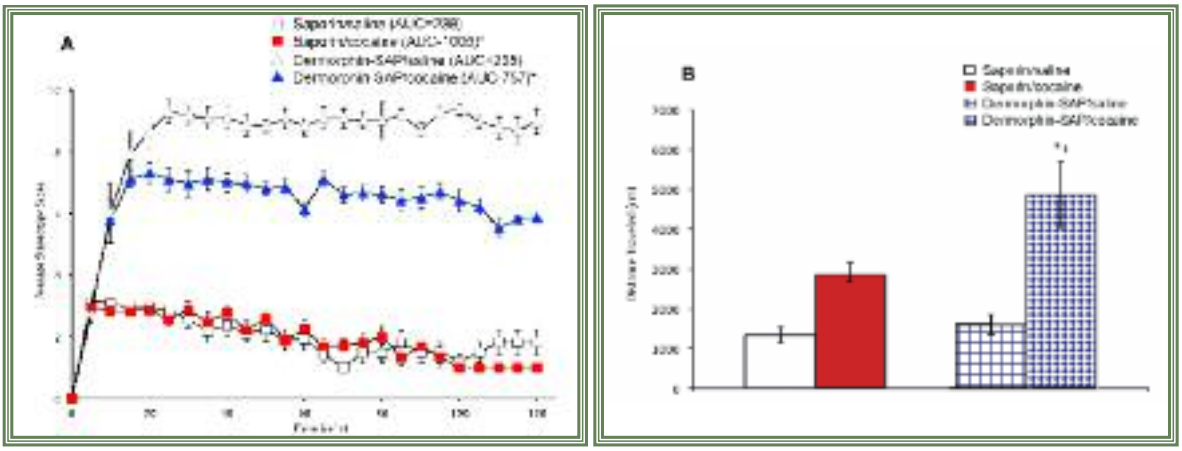

Fig. 1: Effects of intrastriatal infusion of Dermorphin-SAP (17 ng/µl) and repeated cocaine treatment (25 mg/kg), twice daily for one week followed by a week-long drug-free period, with a subsequent cocaine challenge (25 mg/kg) on stereotyped behavior (A) and locomotor activity (B). Values are expressed as the mean ±SEM. For stereotyped behavior the area under the curve (AUC values are in parentheses). Locomotor activity is expressed as the total distance traveled for the entire 2-hr obvservation period in centimeters.

**Significantly different from respective control group, p<0.005*
+Significantly different from saporin (vehicle)-pretreated cocaine-treated group, p<0.005.

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Denise Higgins, Editor

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