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Scientists find new potential antidote for cocaine drug abuse by studying cocaine intake in rats

San Diego, Calif. (September 28, 2009) – Scientists at the Human BioMolecular Research Institute (HBRI) in San Diego, CA, in collaboration with researchers at The Scripps Research Institute in La Jolla, CA, have uncovered important clues about the mechanisms underlying cocaine addiction, and for potential treatment of substance abuse. These studies were recently published in Psychopharmacology[1] and provide important insight into developing antidotes for drug abuse behavior in humans.

Drug addiction is a disorder that may result from neuroplasticity of brain motivation circuits during repeated drug abuse. Modulating the neural adaptations that occur during repeated drug abuse may help to understand drug addiction and guide therapeutic development for treating addiction. These studies focused on the use of inhibitors of the kappa opioid receptor in the brain, and how its activation through prolonged access to cocaine relates to addiction. Several compounds developed at HBRI proved effective in decreasing cocaine intake in a dependent-animal model of human cocaine abuse.

Rats were initially allowed access to cocaine for either short or long-term segments of time. Rats were then treated with novel compounds that acted on the kappa opioid receptors in the brain. Rats that had been trained with longer access to cocaine, mimicking repeated drug abuse in humans, showed significantly decreased cocaine self-administration compared to controls.

The results of this study showed that increased motivation for cocaine in rats with extended access likely involves increased kappa opioid activity that may also contribute to addictive

behavior in humans. These results offer promise for developing a new class of drug candidates for treating human substance abuse.

About HBRI: The Human BioMolecular Research Institute is a non-profit research institute conducting basic research focused on unlocking biological and chemical principles related to diseases of the human brain, cardiovascular disease and cancer. The institute conducts fundamental studies of central nervous system disorders, heart disease and cancer and translates findings into new drug development to address human illness. In addition, the institute promotes scientific learning through community service and public access by disseminating information and sharing research with collaborators, colleagues and the public. For more information, visit www.HBRI.org.

About TSRI: The Scripps Research Institute is one of the country's largest, private, non-profit research organizations. The Institute has become internationally recognized for its basic research into immunology, molecular and cellular biology, chemistry, neurosciences, autoimmune diseases, cardiovascular diseases, virology and synthetic vaccine development. Particularly significant is the Institute's study of the basic structure and design of biological molecules. The philosophy of The Scripps Research Institute emphasizes the creation of basic knowledge in the biosciences for the application of medical and material discoveries; the pursuit of fundamental scientific advances through interdisciplinary programs and collaborations, and the education and training of researchers preparing to meet the scientific challenges of the next century. www.scripps.edu.

[1]Wee S, Orio L, Ghirmai S, Cashman JR, Koob GF (2009) Inhibition of kappa opioid receptors attenuated increased cocaine intake in rats with extended access to cocaine. *Psychopharmacology* **205**:565-75.