

Cocaine changes gene activity in mice

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A team of U.S. researchers has found chronic cocaine administration in mice changes the activity of their genes, enhancing the rewarding effect of cocaine.

The study found cocaine reduced the amounts of an enzyme called histone deacetylase 5, or HDAC5, that normally represses the activity of certain genes in the brain. In mice repeatedly given cocaine, the reduced amounts of HDAC5 allowed 172 genes to be activated, and increased the efforts of mice to obtain cocaine.

The scientists also studied whether chronic stress changed HDAC5 levels by exposing mice to aggressive mice and measuring depressive behavior. The researchers found the resulting chronic stress also reduced HDAC5 function.

The researchers said their findings provide new insight into the pathogenesis of drug addiction, depression, and other stress-related syndromes.

"This fundamentally new insight into the molecular underpinnings of chronic maladaptation in brain could lead to the development of improved treatments for addiction, depression, and other chronic psychiatric disorders," they said.

The study that included researchers at from the University of Texas, University of California-Santa Barbara, Harvard University, and Myogen Inc. appears in the journal *Neuron*.

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