

Research indicates that a common heart drug may reduce cocaine cravings

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Researchers from Boston University School of Medicine and Harvard Medical School have found that diltiazem, a drug used in the treatment of high blood pressure, reduces cocaine cravings in a rat model. These findings will appear in the March issue of the leading medical journal *Nature Neuroscience*.

Previous work showed that two brain chemicals, dopamine and glutamate, independently contribute to the development of cocaine addiction. This new research indicates that calcium channels provide critical links between dopamine and glutamate that drives the intense craving associated with cocaine addiction. Diltiazem, one of a class of drugs known as calcium channel blockers, disrupts the connection between dopamine and glutamate formed during chronic cocaine use.

According to the researchers, brain calcium plays an important role in learning and memory in that calcium influences an enzyme known as the "memory molecule." "Our work shows that cocaine increases the levels of this molecule specifically in a brain area that controls motivation. Thus, cocaine use teaches the brain to be addicted, resulting in a dysfunctional form of learning that drives the overwhelming desire to consume more cocaine," said senior author Chris Pierce, a professor of pharmacology and psychiatry at Boston University School of Medicine.

Currently, there are no effective drug therapies for cocaine addiction. Pierce noted that research such as this using animal models could lead to desperately needed medications. "The strength of this work is that it tells us something fundamental about how brain chemistry changes as cocaine addiction takes hold. Importantly, our findings also suggest new strategies for developing cocaine addiction therapies, which thus far remain elusive," he added.

Source: Boston University

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