

Memory-boosting drug may help cocaine addicts avoid relapse

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A memory-boosting medication paired with behavioral therapy might help addicts stay clean, according to new animal research in the Aug. 4 issue of *The Journal of Neuroscience*. The study suggests D-cycloserine, previously used in the lab to treat fear and anxiety disorders, could help an addict resist drugs even when confronted with drug-related cues outside of rehab.

Substance abusers have high rates of relapse, often falling back into old habits only days after they "quit." Addictive substances are difficult to resist in part because a single environmental cue, such as a drug-related sight or smell, can trigger cravings.

In this study, a group of researchers led by Mary Torregrossa, PhD, of Yale University, observed 168 rats that self-administered cocaine for weeks, a behavior that mimics addiction in humans. The authors then used a form of [behavioral therapy](#) called extinction therapy to dampen the craving-inducing effects of cues. The scientists supplemented the therapy with the memory-enhancing drug.

"Extinction therapy usually only works where the therapy takes place, like a treatment center," Torregrossa said. "Using drugs like D-cycloserine to make extinction work more broadly is a big advancement in the treatment of addiction."

Notably, a human addict may rebuff drugs while inside a treatment facility and even stay clean after returning home. However, after

encountering a former drug partner, the abuser feels an overwhelming need to resume drug-taking. In extinction therapy, the aim is to break the association between these dangerous, omnipresent cues and drug use.

The new results show that extinction therapy, in conjunction with D-cycloserine, could combat relapse due to cues, even in new environments. The authors also found that the medication acted primarily on a brain region called the nucleus accumbens, an area associated with drug addiction and the formation of drug-related memories. D-cycloserine acts at specific kinds of receptors for the [neurotransmitter](#) glutamate, a chemical that plays a key role in learning and memory.

Barry Everitt, PhD, of the University of Cambridge, an expert in addiction and the brain who was unaffiliated with the study, said the study by Torregrossa and her colleagues has implications for transferring clinical therapies to the real world of the addict.

"The study suggests that boosting the activity of glutamate in a specific area of the brain removes this context-specificity of extinction, and might therefore make existing addiction therapies more effective," Everitt said.

Provided by Society for Neuroscience

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