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Study confirms prescription weight-loss medication helps with opiate addiction recovery

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Researchers from The University of Texas Medical Branch at Galveston have confirmed that a prescription weight-loss pill decreases the urge to use opiates such as oxycodone.

In a study published in *ACS Chemical Neuroscience*, the researchers led by UTMB scientist Kathryn Cunningham found that the drug, lorcaserin, reduced the use and craving for the opioid oxycodone in preclinical studies. Cunningham is director of UTMB's Center for Addiction Research and a professor in the department of Pharmacology and Toxicology.

Opiate abuse is a major public health problem and according to the U.S. Centers for Disease Control and Prevention, the number of deaths from prescription opiate overdose in America has quadrupled since 1999. High relapse rates and too few people remaining in treatment programs long enough for it to really benefit them continues to pose major challenges in treatment for the misuse of prescription opiates such as oxycodone and illegal opiates such as heroin.

Most of the treatments available to reduce opiate misuse work by occupying opioid receptors in the brain. If someone were to take an opiate while on these treatments, they would not feel the signature euphoria as strongly. However, a person's drug-taking environment is a powerful cue that can condition someone to anticipate the experience of

taking of the drug; this is called cue reactivity. People who have tried the currently available medications often relapse when they are around the people, places or paraphernalia that they associate with opiate use.

Lorcaserin, prescribed for weight loss, alters the serotonin system by changing chemical signals that affect satiety, the sensation of fullness. Serotonin regulates the brain circuitry involved in drug reward and cue reactivity, particularly though activating serotonin 2C receptors. Previous work by Cunningham and her team have shown that lorcaserin decreases how many times rats will complete a simple task to earn a dose of cocaine. However, much less is known about the involvement of the serotonin 2C receptors in altering how opiates feel rewarding for the user.

The researchers trained rats to self-administer oxycodone while exposed to specific lights and sounds that create a drug-taking environment. Once the rats were used to regularly consuming oxycodone, they went through a period where no oxycodone was available to them. The researchers then gave lorcaserin to some of the rats while others were given a placebo and placed them in the drug-associated environment. At this point, oxycodone was again made available to the rats. The lorcaserin rats self-administered less oxycodone and reacted less strongly to cues associated with taking the drug. In order to show that this effect was attributed to the lorcaserin, a group of rats was given lorcaserin as well as a drug that blocks the serotonin 2C receptors - thus cancelling out the effect of the lorcaserin - those rats tried very hard to get oxycodone.

"The effectiveness of lorcaserin in reducing oxycodone seeking and craving highlights the therapeutic potential for lorcaserin in the treatment of opioid use disorder," said Cunningham. "We plan more studies to better understand how drugs like lorcaserin can help us stem the tide of addiction in America."

More information: Harshini Neelakantan et al. Lorcaserin Suppresses Oxycodone Self-Administration and Relapse Vulnerability in Rats, *ACS Chemical Neuroscience* (2017). DOI: 10.1021/acschemneuro.6b00413