New vaccine could help people overcome bath salts abuse

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Researchers have developed a vaccine for one of the most dangerous types of synthetic cathinones, or bath salts. The vaccine blunts the illegal stimulant's effects on the brain, which could help recovering drug users who experience a relapse.

Samantha McClenahan, a doctoral student at the University of Arkansas for Medical Sciences, will present test results for the new vaccine at the American Society for Pharmacology and Experimental Therapeutics annual meeting during the 2018 Experimental Biology meeting to be held April 21-25 in San Diego.

Synthetic cathinones are stimulants made to mimic the stimulate effects found in the khat plant. The most powerful compounds in this drug class can produce deadly overdoses as well as life-threatening side effects such as organ failure.

The new vaccine targets two very potent synthetic cathinones known as methylenedioxypyrovalerone (MDPV) and alpha-pyrrolidinovalerophenone (alpha-PVP). "Because the chemical structures of these illegal drugs are often changed to evade drug laws, we decided it was important to develop a single vaccine that will be effective against more than one medically dangerous synthetic cathinone," said McClenahan. Results from the new study showed that rodents receiving the vaccine produced high amounts of antibodies that attached tightly to MDPV and alpha-PVP in the blood stream. This immune response was able to decrease the stimulant effects of MDPV for months. The

researchers observed that vaccinated rats exhibited significantly less MDPV-induced movement and significantly shortened MDPV-induced activity compared to untreated rats.

"Our goal is to develop a vaccine that would be effective for at least 6 to 12 months so that it could be used as a long-lasting aid to the rehabilitation process," said McClenahan. "It would likely help reduce drug concentrations in critical organs and reduce or eliminate the rewarding effect of the drug. This could improve the chances of an individual remaining in rehabilitation treatment, which might increase the likelihood of a successful outcome."

The researchers plan to continue to test the vaccine's ability to prevent the entry of MDPV into the brain and heart, which causes the rewarding effects of the drug and is a leading cause of the drug's dangerous side effects. This research was supported by National Institute on Drug Abuse grant RO1DA039195 and NIH training grant T32GM106999.

More information: Samantha McClenahan will present this research at 12:30-2:30 p.m. Sunday, April 22, Exhibit Halls A-D, San Diego Convention Center (poster C20 550.7) (abstract) and at 11:50 a.m. Tuesday, April 24 during the Simulants I Session (abstract).

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