

# Parental exposure to THC linked to drug addiction, compulsive behavior in unexposed offspring

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Exposing adolescent rats to THC (tetrahydrocannabinol) –the primary psychoactive ingredient in marijuana—can lead to molecular and behavioral alterations in the next generation of offspring, even though progeny were not directly exposed to the drug, researchers at the Icahn School of Medicine at Mount Sinai have found. Male offspring showed stronger motivation to self-administer heroin during their adulthood and molecular changes in the glutamatergic system, which is the most important excitatory pathway for neurotransmission in the brain. Damage in the glutamate pathway, which regulates synaptic plasticity, has been linked to disturbances in goal-directed behavior and habit formation.

The study is published online Jan. 22 in *Neuropsychopharmacology*.

"Our study emphasizes that cannabis [marijuana] affects not just those exposed, but has adverse affects on future generations," said Yasmin Hurd, PhD, the study's senior author, and professor of psychiatry and neuroscience at the Icahn School of Medicine at Mount Sinai. "Finding increased vulnerability to drug addiction and compulsive behavior in generations not directly exposed is an important consideration for legislators considering legalizing marijuana."

In the study, Dr. Hurd and colleagues gave adolescent male rats 1.5 mg/kg of THC, similar to about one joint in human use. None of the rats

had been exposed to THC before, but their parents were exposed to THC as teens and then mated later in life. THC-exposed offspring worked harder to self-administer heroin by pressing a lever multiple times to get heroin infusion.

Although [marijuana](#) use and safety tends to be discussed in terms of its impact to the individual during the lifetime, few studies have addressed adverse effects in future generations. "What this opens up are many questions regarding the epigenetic mechanisms that mediate cross-generational brain effects," said Dr. Hurd.

Future studies are now being explored to determine whether THC effects continue to be transmitted to even the subsequent grandchildren and great-grandchildren generations. Another important question relates to potential treatment interventions in order to reverse the cross-generational THC effects. Such insights could also have implications for novel treatment opportunities for related psychiatric illnesses.

Provided by The Mount Sinai Hospital

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