

Researchers find mice lacking gene for PTPRD self-administer less cocaine

October 23 2018, by Bob Yirka



A pile of cocaine hydrochloride. Credit: DEA Drug Enforcement Agency, public domain

A team with members affiliated with several institutions in the U.S. has found that disabling the gene responsible for the production of the protein tyrosine phosphatase D (PTPRD) caused test mice to self-

administer less cocaine when allowed to take as much as they wanted. In their paper published in the *Proceedings of the National Academy of Sciences*, the group describes their study and what they found when administering a drug to test mice that mimicked disabling the same gene.

Prior research has produced evidence of a genetic component involved in addiction—some people are more susceptible, some less. But finding that [genetic component](#) has proven difficult. In this new effort, the researchers report that they may have found a gene that appears to be at least partly responsible for addictive cravings.

The work by the team involved studying PTPRD and the gene that expresses it. Prior research had suggested it plays a role in addiction. Some studies had even found that people who produce less of it are less likely to become addicted to cocaine than are those who produce more. To confirm this prior finding, the researchers disabled a copy of the gene responsible for its production in test mice and then compared them with [normal mice](#). The researchers report that the mice with the disabled gene consumed 70 percent less cocaine when given a chance to consume all they wanted.

Encouraged by their findings, the researchers looked for a chemical that could accomplish the same feat without genetic altering. They found a molecule called 7-butoxy illudalic acid analog (7-BIA) that did the trick. Not only did it inhibit PTPRD activity, but it also caused no observable side-effects.

The researchers tested the effectiveness of 7-BIA by addicting several test mice to cocaine and then giving them a dose of the inhibitor. Those mice helped themselves to a maximum dose just 48 percent of the time, compared to untreated [mice](#) who dosed themselves to the max 80 percent of the time.

The researchers suggest their findings indicate that 7-BIA might serve as a tool for helping people kick a [cocaine](#) addiction. But they noted it might also help people kick other drug addictions, as well.

More information: George R. Uhl et al. Cocaine reward is reduced by decreased expression of receptor-type protein tyrosine phosphatase D (PTPRD) and by a novel PTPRD antagonist, *Proceedings of the National Academy of Sciences* (2018). [DOI: 10.1073/pnas.1720446115](https://doi.org/10.1073/pnas.1720446115)

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Citation: Researchers find mice lacking gene for PTPRD self-administer less cocaine (2018, October 23) retrieved 18 April 2024 from <https://medicalxpress.com/news/2018-10-mice-lacking-gene-ptprd-self-administer.html>

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