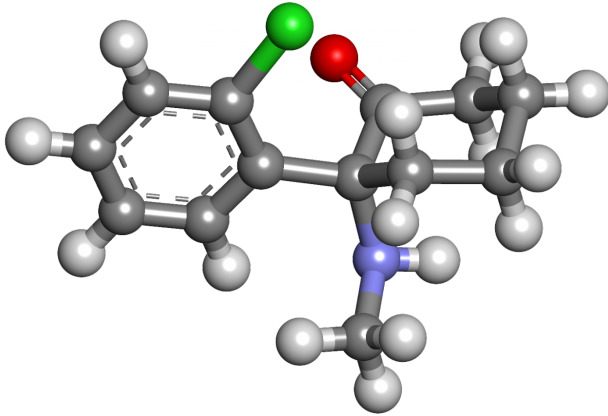


Ketamine found to be unlikely to lead to addiction

28 July 2022, by Bob Yirka



3D model of Ketamine. Credit: Wikipedia

A team of researchers at the University of Geneva has found that ketamine is unlikely to be addictive to people who use it for extended periods of time. In their paper published in the journal *Nature*, the group describes their study of the impact of the synthetic compound on the brains of mice and what they learned about its impact on different brain regions. Rianne Campbell and Mary Kay Lobo, with the University of Maryland School of Medicine have published a News and Views piece in the same journal issue outlining the work done by the team in Switzerland.

Ketamine (first created 1962) is a synthetic compound that is used as an anesthetic drug in [clinical practice](#). It has also been found to be useful in some settings as an antidepressant therapy. Ketamine has also become increasingly popular as an illegal hallucinogen. Because of its possible use as a treatment for depression and because of its use by the non-medical community, interest has arisen regarding how addictive the drug may be. In this new effort, the researchers sought to find that answer by studying the ways the drug impacts the

mouse brain.

The researchers began their study by comparing the impact of ketamine on the behavior of mice with no prior exposure to it or cocaine. They found that given the choice, mice had no preference of one over the other. The team then undertook a study of the way the drug impacts two parts of the mouse brain—the [ventral tegmental area](#) (VTA) and the [nucleus accumbens](#) (NAc). The researchers found that as with other drugs, exposure of the VTA to ketamine led to increases in production of dopamine. That dopamine made its way to the NAc where [nerve cells](#) were activated,

In taking a closer look at the impact of raised levels of dopamine due to ketamine exposure on the NAc, the researchers found it lasted longer for cocaine. This, they found, was due to a changes ketamine made in the NAc negative feedback system. They also found that ketamine reduced the activity of some neurons in the VTA that inhibit the neurotransmitter GABA. The team finished their work by conducting addictive behavioral tests with mice, comparing their desire for more ketamine versus cocaine.

The researchers suggest their results all point to the same conclusion—[ketamine](#) is very unlikely to have much of an addictive impact on mice (and by extension people) who use it on a regular basis.

More information: Linda D. Simmler et al, Dual action of ketamine confines addiction liability, *Nature* (2022). [DOI: 10.1038/s41586-022-04993-7](https://doi.org/10.1038/s41586-022-04993-7)

Rianne Campbell et al, A short burst of reward curbs the addictiveness of ketamine, *Nature* (2022). [DOI: 10.1038/d41586-022-01948-w](https://doi.org/10.1038/d41586-022-01948-w)

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