

How cannabis and cannabis-based drugs harm your brain

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The cannabis plant. Credit: Lancaster University

Long-term use of either cannabis or cannabis-based drugs impairs memory say researchers. The study has implications for both recreational users and people who use the drug to combat epilepsy, multiple sclerosis and chronic pain.

They found that mice exposed to the [drug](#) long-term had "significant ... memory impairments" and could not even discriminate between a familiar and novel object.

There is little understanding of the potential negative side effects of long-term [cannabinoid](#) exposure, though it is already known that heavy, regular cannabis use increases the risk of developing [mental health](#) problems including psychosis and schizophrenia.

More and more people are using the drug long-term due to its legalisation in several countries, while more potent varieties are available for recreational users.

Researchers from Lancaster and Lisbon Universities studied the effects of the cannabinoid drug WIN 55,212-2 in mice and found that:

- Long-term exposure impairs learning and memory in the animals
- Brain imaging studies showed that the drug impairs function in key brain regions involved in learning and memory
- Long-term exposure to the drug impairs the ability of brain regions involved in learning and memory to communicate with each other, suggesting that this underlies the negative effects of the drug on memory

Dr. Neil Dawson, the lead researcher from Lancaster University said "This work offers valuable new insight into the way in which long-term cannabinoid exposure negatively impacts on the brain. Understanding these mechanisms is central to understanding how long-term cannabinoid exposure increases the risk of developing mental health issues and memory problems."

He also highlighted the relevance of the work to those using cannabinoid-based therapies to treat medical conditions.

"Cannabis-based therapies can be very effective at treating the symptoms of chronic diseases such as epilepsy and [multiple sclerosis](#), and dramatically increase the quality of life for people living with these conditions. We need to understand the side effects that these people may experience so that we can develop new interventions to minimise these side effects".

Professor Ana Sebastiao, lead researcher at the University of Lisbon, said: "Importantly, our work clearly shows that prolonged cannabinoid intake, when not used for medical reasons, does have a negative impact in brain function and memory. It is important to understand that the same medicine may re-establish an equilibrium under certain diseased conditions, such as in epilepsy or MS, but could cause marked imbalances in healthy individuals." As for all medicines, cannabinoid based therapies have not only beneficial disease-related actions, but also [negative side effects](#). It is for the medical doctor to weight the advantages of the therapy, taking into consideration quality of life and diseases progression, against the potential side effects."

More information: Francisco M Mouro et al, Chronic, intermittent treatment with a cannabinoid receptor agonist impairs recognition memory and brain network functional connectivity, *Journal of Neurochemistry* (2018). [DOI: 10.1111/jnc.14549](https://doi.org/10.1111/jnc.14549)

Provided by Lancaster University

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