

Metabolic 'fingerprint' predicts impairment from medical cannabis

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Researchers have uncovered signature metabolites—much like fingerprints in the blood—linked to the cognitive dysfunction and impaired motor skills associated with medical cannabis treatment.

The work could lead to better roadside blood tests for impairment, and could also point the way toward supplements or strains of [medical cannabis](#) that reduce impairment while preserving pain management benefits, according to principal investigator Jason Dyck, professor in the Faculty of Medicine & Dentistry, director of the Cardiovascular Research Center, and Canada Research Chair in Molecular Medicine.

"We wanted to see if there is a metabolic fingerprint in the serum that identifies if a person is cognitively impaired when they take cannabis," said Dyck.

The researchers made the discovery by giving male rats oil containing medical-grade cannabis with and without the active ingredient tetrahydrocannabinol (THC), or just oil with no cannabis, then observing their behavior and examining [blood samples](#) to look for a correlation in the metabolites—substances produced when the body breaks down food, drugs or tissues such as fat or muscle.

"We found metabolites that were changed in the same direction that we see in studies of cognitive impairment from other conditions," Dyck said. "There seems to be a fingerprint that is more predictive of cognitive impairment than just looking at THC levels alone."

Seeking safer pain relief

Pain relief is the main reason patients are prescribed medical cannabis, but many report dissatisfaction with the accompanying [cognitive dysfunction](#), according to research by Dyck and Dean Eurich, professor in the School of Public Health, based on a database of 10,000 medical cannabis users in Ontario.

"Sure, you're managing your pain, but [cognitive impairment](#) means you can't drive a car, you can't work and your daily life may be severely

affected," Dyck said.

Dyck and Eurich have done a number of other studies on outcomes for authorized medical cannabis users based on the database, including finding that while the incidence of cannabis poisoning or cannabis-related mental disorders was low, the patients did face an increased risk of hospital visits for cardiovascular events.

In the metabolomics study, the researchers noted that animals treated with medical cannabis containing THC had lower levels of butyric acid, a microbial byproduct of digestion, in their blood. The next step for the research team will be to examine whether [butyric acid](#) or sodium butyrate supplements could be effective at lessening impairment when taken with medical cannabis. The study is published in *Frontiers in Pharmacology*.

More information: Zaid H. Maayah et al, Metabolomic Fingerprint of Behavioral Changes in Response to Full-Spectrum Cannabis Extracts, *Frontiers in Pharmacology* (2022). [DOI: 10.3389/fphar.2022.831052](https://doi.org/10.3389/fphar.2022.831052)

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