

The coffee cannabis connection

15 March 2018



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It's well known that a morning cup of joe jolts you awake. But scientists have discovered coffee affects your metabolism in dozens of other ways, including your metabolism of steroids and the neurotransmitters typically linked to cannabis, reports a new study from Northwestern Medicine.

In a study of [coffee consumption](#), Northwestern scientists were surprised to discover coffee changed many more metabolites in the blood than previously known. Metabolites are chemicals in the blood that change after we eat and drink or for a variety of other reasons.

The neurotransmitters related to the [endocannabinoid](#) system—the same ones affected by cannabis—decreased after drinking four to eight cups of coffee in a day. That's the opposite of what occurs after someone uses cannabis. Neurotransmitters are the chemicals that deliver messages between nerve cells.

Cannabinoids are the chemicals that give the cannabis plant its medical and recreational properties. The body also naturally produces endocannabinoids, which mimic cannabinoid activity.

In addition, certain metabolites related to the androsteroid system increased after drinking four to eight cups of coffee in a day, which suggests coffee might facilitate the excretion or elimination of steroids. Because the steroid pathway is a focus for certain diseases including cancers, coffee may have an effect on these diseases as well.

"These are entirely new pathways by which coffee might affect health," said lead author Marilyn Cornelis, assistant professor of preventive medicine at Northwestern University Feinberg School of Medicine. "Now we want to delve deeper and study how these changes affect the body."

Little is known about how coffee directly impacts health. In the new study, Northwestern scientists applied advanced technology that enabled them to measure hundreds of metabolites in human blood samples from a coffee trial for the first time. The study generates new hypotheses about coffee's link to health and new directions for coffee research.

The paper will be published March 15 in the *Journal of Internal Medicine*.

Drinking lots of coffee for science

In the three-month trial based in Finland, 47 people abstained from coffee for one month, consumed four cups a day for the second month and eight cups a day for the third month. Cornelis and colleagues used advanced profiling techniques to examine more than 800 metabolites in the blood collected after each stage of the study.

Blood metabolites of the endocannabinoid system decreased with coffee consumption, particularly with eight cups per day, the study found.

The endocannabinoid metabolic pathway is an important regulator of our stress response, Cornelis said, and some endocannabinoids decrease in the presence of chronic stress.

"The increased coffee consumption over the two-

month span of the trial may have created enough stress to trigger a decrease in metabolites in this system," she said. "It could be our bodies' adaptation to try to get stress levels back to equilibrium."

The endocannabinoid system also regulates a wide range of functions: cognition, blood pressure, immunity, addiction, sleep, appetite, energy and glucose metabolism.

"The endocannabinoid pathways might impact eating behaviors," suggested Cornelis, "the classic case being the link between cannabis use and the munchies."

Coffee also has been linked to aiding weight management and reducing risk of type 2 diabetes.

"This is often thought to be due to caffeine's ability to boost fat metabolism or the glucose-regulating effects of polyphenols (plant-derived chemicals)," Cornelis said. "Our new findings linking coffee to endocannabinoids offer alternative explanations worthy of further study."

It's not known if caffeine or other substances in coffee trigger the change in metabolites.

Although Cornelis studies the effects of [coffee](#), she didn't drink it growing up in Toronto or later living in Boston.

"I didn't like the taste of it," Cornelis said. But when she moved to join Northwestern in 2014, she began to enjoy several cups a day. "Maybe it's the Chicago water," she mused, "but I do have to add cream and sweetener."

Provided by Northwestern University

APA citation: The coffee cannabis connection (2018, March 15) retrieved 17 October 2019 from <https://medicalxpress.com/news/2018-03-coffee-cannabis.html>

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