

Research shows CBD reduces inflammation in HIV-infected brain cells

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CBD may be a promising therapy for people living with HIV. While the virus can be controlled with treatment, it can still wreak havoc on the brain and cause problems with cognition.

Florida International University (FIU) researchers have found that CBD's anti-inflammatory effects can essentially keep HIV-infected cells in the brain under control, preventing them from acting up.

This is important because neuroinflammation associated with HIV creates a dangerous domino effect: inflammation causes infected cells hiding in the brain to activate, start the replication process and spread the virus back into the body. As published in *Scientific Reports*, the team showed that CBD works at the [molecular level](#) to lower inflammation and keep these cells dormant.

The suppression of both inflammation and the HIV-infected cells is key because of the way HIV acts. After it hijacks the immune cells in the bloodstream, HIV hitches a ride through the [blood-brain barrier](#). Once in the brain, the virus targets microglia, the brain's [immune cells](#). These infected cells then go into a sort of hibernation.

"Even though HIV crosses the [blood-brain barrier](#), antiretroviral medicines that keep the virus from replicating cannot effectively cross the blood brain barrier, and so the brain becomes a repository for HIV," explains Adriana Yndart Arias, the study's first author and FIU Herbert Wertheim College of Medicine Ph.D. student. HIV-associated neuroinflammation wakes up the sleeping cells and causes them to produce the virus. The infection can then move back out of the brain into the bloodstream.

It perpetuates a [vicious cycle](#) where the infection keeps going, said Madhavan Nair, distinguished professor and director of FIU's Institute of NeuroImmune Pharmacology.

Inflammation is the root of many of the cognitive-related symptoms people with HIV face. And the reason they rely on cannabis or [medical marijuana](#) to manage pain, nausea and more. These products contain

THC, a substance that produces the psychoactive effects that cause a "high" and other side effects, like addiction. Nair, who along with his team has been conducting studies on how drug abuse impacts HIV infections, points out this can exacerbate symptoms.

There's not been much research into how compounds like THC and CBD—both derived from the same plant—impact the brain at the molecular level. Yndart, who works in Nair's lab, decided to find out.

She tested different concentrations of THC and CBD on hundreds of HIV-infected microglia cells. Then, cell by cell, she searched for specific markers, or clues, that exposed whether the cells were activated.

CBD-treated cells reduced the numbers of inflammatory molecules and kept the infected cells from activating.

Nair and Yndart emphasize CBD is a promising candidate for new ways to treat neurocognitive disorders and other inflammatory disorders caused by HIV, but more research will be needed, including [clinical trials](#) that investigate different CBD formulations.

More information: Adriana Yndart Arias et al, Anti-inflammatory effects of CBD in human microglial cell line infected with HIV-1, *Scientific Reports* (2023). [DOI: 10.1038/s41598-023-32927-4](https://doi.org/10.1038/s41598-023-32927-4)

Provided by Florida International University

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