Synthetic derivatives of THC may weaken HIV-1 infection to enhance antiviral therapies

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A new use for compounds related in composition to the active ingredient in marijuana may be on the horizon: a new research report published in the *Journal of Leukocyte Biology* shows that compounds that stimulate the cannabinoid type 2 (CB2) receptor in white blood cells, specifically macrophages, appear to weaken HIV-1 infection. The CB2 receptor is the molecular link through which the pharmaceutical properties of cannabis are manifested. Diminishing HIV-1 infection in this manner might make current anti-viral therapies more effective and provide some protection against certain HIV-1 complications.

"The synthetic compounds we used in our study may show promise in helping the body fight HIV-1 infection,'" said Yuri Persidsky, M.D., Ph.D., a researcher involved in the work from the Department of Pathology and Laboratory Medicine at Temple University School of Medicine in Philadelphia, PA. "As compounds like these are improved further and made widely available, we will continue to explore their potential to fight other viral diseases that are notoriously difficult to treat."

To make this discovery, scientists used a cell culture model to infect human macrophages with HIV-1 and added synthetic compounds similar to the active ingredient in marijuana to activate the CB2 receptor. At different times during the infection, samples from the culture were taken to see if the replication of the HIV virus was decreased. The researchers

observed diminished HIV growth and a possible protective effect from some HIV-1 complications.

"HIV/AIDS has posed one of the most significant health challenges in modern medicine," said John Wherry, Ph.D., Deputy Editor of the *Journal of Leukocyte Biology*. "Recent high profile vaccine failures mean that all options need to be on the table to prevent or treat this devastating infection. Research on the role of cannabinoid type 2 receptors and viral infection may one day allow targeting these receptors to be part of combination therapies that use exploit multiple weaknesses of the virus simultaneously."

More information: Servio H. Ramirez, Nancy L. Reichenbach, Shongshan Fan, Slava Rom, Steven F. Merkel, Xu Wang, Wen-zhe Ho, and Yuri Persidsky. Attenuation of HIV-1 replication in macrophages by cannabinoid receptor 2 agonists. J. Leukoc. Biol. May 2013 93:801-810; doi:10.1189/jlb.1012523

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