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# Effects of Marijuana on Viral Transcription in HIV-1 Infected Cells and Resulting Extracellular Vesicle Release

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As of 2016, roughly 18.2 million of the approximately 36.9 million people living with HIV globally were receiving combination antiretroviral therapy (cART). Despite decades of research and development of this complex drug regimen, which is effective in the prevention of new infections, cells with an integrated HIV-1 genome have leaky transcription which can produce viral RNAs and proteins. These viral products can then be packaged into extracellular vesicles (EVs) and released from the infected cell. EVs, specifically exosomes, produced from HIV-1 infected cells contain viral mRNAs and incubation of these exosomes with cells caused a significant increase in the production of the proinflammatory cytokines, implicating EVs as a possible mechanism for the chronic inflammation observed in the CNS of people living with HIV-1 on antiretroviral therapy[1-4]. Here, we investigated the effects of cannabinoids, CBD and THC, on viral transcription in HIV-1 infected cells and resulting changes in EV release. Our data suggests CBD and THC can act as viral transcription inhibitors and potentially regulate autophagosome release from the cytoplasm, reinforcing the control of the drugs of abuse on autophagy of latently infected cells under cART. Additionally, the results show a significant reduction in the release of EVs containing viral cargos from infected cells, *in vitro* and *in vivo*, potentially through modulation of the autophagy pathway. These studies are significant in that marijuana may provide a protective effect by alleviating the pathogenic effects of EVs in HIV-1 and CNS-related infections.

References

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