

## Could low level laser therapy and highly active antiretroviral therapy lead to complete eradication of HIV-1 in vitro?

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### ABSTRACT:

Human immunodeficiency virus (HIV-1) infection remains a major health problem despite the use of highly active antiretroviral therapy (HAART), which has greatly reduced mortality rates. Due to the unavailability of an effective vaccine or a treatment that would completely eradicate the virus, the quest for new and combination therapies continues. In this study we explored the influence of Low Level Laser Therapy (LLLT) in HIV-1 infected and uninfected cells. Literature reports LLLT as widely used to treat different medical conditions such as diabetic wounds, sports injuries and others. The technique involves exposure of cells or tissue to low levels of red and near infrared laser light. Both HIV infected and uninfected cells were laser irradiated at a wavelength of 640 nm with fluencies ranging from 2 to 10 J/cm<sup>2</sup> and cellular responses were assessed 24 hours post laser treatment. In our studies, laser therapy had no inhibitory effects in HIV-1 uninfected cells as was indicated by the cell morphology and proliferation results. However, laser irradiation enhanced cell apoptosis in HIV-1 infected cells as the laser fluencies increased. This led to further studies in which laser irradiation would be conducted in the presence of HAART to determine whether HAART would minimise the detrimental effects of laser irradiation in infected cells.