

Therapeutic strategies to fight HIV-1 latency: progress and challenges

Sello Lebohang Manoto, Lebogang Thobakgale, Rudzani Malabi, Charles Maphanga, Saturnin Ombinda-Lemboumba, Patience Mthunzi-Kufa

Abstract:

The life-long persistence of human immunodeficiency virus type-1 (HIV-1) in latent reservoirs is a major hurdle in the eradication of HIV-1, even though highly active antiretroviral therapy (HAART) can be effective in reducing the plasma HIV-1 RNA to less than 50 copies per mL, which is below the detection limit of most clinical assays. In the latent reservoirs the provirus is integrated in the host genome but does not actively replicate and thus is not inhibited by HAART or recognized by the host immune system. There has been increasing scientific interest and investment into research towards HIV cure due to the challenges and limitation of life long treatment. The various strategies that have been developed aim to activate gene expression in HIV latent cells which might lead to the elimination of the virus by HAART or the immune system. In this review we discuss latency and therapeutic approaches that are being evaluated to eradicate HIV latently infected cells to overcome the burden of life long HAART. In addition, we explore the possibility of delivering HAART in latently infected cells using femtosecond laser pulses, a topic closely studied in our research.