A Novel Dual Fluorescent HIV-1 to Study Latency

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After almost 30 years of study, infection with the human immunodeficiency virus-1 (HIV-1) remains incurable. Although highly active antiretroviral therapy (HAART) suppresses HIV-1 replication, the virus persists in reservoirs of latently infected cells that avoid viral cytopathic effects and host immune clearance. Much research effort has been devoted to understanding HIV latency. However and despite much work, no drug can purge the reservoir. Moreover, many unanswered questions remain about the latent state. For example, how is latency established? How is it maintained in cells? What types of cells become latently infected? Studies to approach these questions have been complicated, partly because latently infected cells are rare in vivo. Thus, laboratory models have been used mainly to study the molecular mechanisms governing HIV-1 latency, and unfortunately, those models do not allow us to recognize cells. So latently infected cells cannot be isolated for study. To overcome these limitations, we developed a new HIV-1 virus that contains two fluorescent markers. These markers allow us to recognize cells that are latently infected, actively infected and uninfected and to isolate each subpopulation. Using this new tool, we can examine important questions that will lead to a better understanding of HIV-1 persistence, and to test/propose promising treatment for the depletion of these viral reservoirs.