Macrophages and their relevance in Human Immunodeficiency Virus Type I infection.

Abstract:
Macrophages are important target cells for the Human Immunodeficiency Virus Type I (HIV-1) in vivo. Several studies have assessed the molecular biology of the virus in this cell type, and a number of differences towards HIV-1 infection of CD4+ T cells have been described. There is a broad consensus that macrophages resist HIV-1 infection much better than CD4+ T cells. Among other reasons, this is due to the presence of the recently identified host cell restriction factor SamHD1, which is strongly expressed in cells of the myeloid lineage. Furthermore, macrophages produce and release relatively low amounts of infectious HIV-1 and are less sensitive to viral cytotoxicity in comparison to CD4+ T cells. Nevertheless, macrophages play a crucial role in the different phases of HIV-1 infection. In this review, we summarize and discuss the significance of macrophages for HIV-1 transmission, the acute and chronic phases of HIV-1 infection, the development of acquired immunodeficiency syndrome (AIDS) and HIV-associated diseases, including neurocognitive disorders. We propose that interaction of HIV-1 with macrophages is crucial during all stages of HIV-1 infection. Thus, long-term successful treatment of HIV-1 infected individuals requires potent strategies to prevent HIV-1 from entering and persisting in these cells.