

# New Challenges of HIV-1 Infection: How HIV-1 Attacks and Resides in the Central Nervous System

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Acquired immunodeficiency syndrome (AIDS) has become one of the most devastating pandemics in recorded history. The main causal agent of AIDS is the human immunodeficiency virus (HIV), which infects various cell types of the immune system that express the CD4 receptor on their surfaces. Today, combined antiretroviral therapy (cART) is the standard treatment for all people with HIV; although it has improved the quality of life of people living with HIV (PLWH), it cannot eliminate the latent reservoir of the virus. Therefore HIV/AIDS has turned from a fatal disease to a chronic disease requiring lifelong treatment. Despite significant viral load suppression, it has been observed that at least half of patients under cART present HIV-associated neurocognitive disorders (HAND), which have been related to HIV-1 infection and replication in the central nervous system (CNS). Several studies have focused on elucidating the mechanism by which HIV-1 can invade the CNS and how it can generate the effects seen in HAND. This review summarizes the research on HIV-1 and its interaction with the CNS with an emphasis on the generation of HAND, how the virus enters the CNS, the relationship between HIV-1 and cells of the CNS, and the effect of cART on these cells.

AIDS

cART

CNS

CNS cells

HAND

HIV-1

central nervous system

disorders of higher cerebral function

human

Human immunodeficiency virus 1

Human immunodeficiency virus infection

metabolism

pathogenicity

pathophysiology

quality of life

virology

Central Nervous System

HIV Infections

HIV-1

Humans

Neurocognitive Disorders

Quality of Life