

## **Consequences of HIV-1 in Human Brain: Implications to AIDS patients**

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Understanding cellular and molecular events of virus-cell interactions during the course of infection is essential for defining a disease and developing potential therapies. A wide range of neurological complications is associated with acquired immune deficiency syndrome (AIDS), including the late-stage syndrome of human immunodeficiency virus (HIV-) associated dementia that involves severe cognitive impairment, motor disturbances, and behavioural changes. HIV-1 invades the central nervous system (CNS) and productively infects brain macrophages and microglial cells. A subpopulation of infected astrocytes is also routinely detected in brain autopsies from HIV patients in adult as well as pediatric cases. The world wide incidence of HIV- associated dementia has been reported to be more than 30% of AIDS population. The advent of highly active anti-retroviral therapy (HAART) has only reduced the incidence of severe form of HIV dementia to around 10% but less-severe symptoms of HIV encephalopathy continue to affect nearly 50% of HIV patients, which in part may be attributed to the fact that some drugs used do not efficiently reach the brain or the ones that access brain, may cause significant neurotoxicity. It is proven beyond doubt that neurological complications arise following neuronal damage that is in partly mediated by glial cells. In particular, the the astrocytes, most abundant cell type of the brain, are shown to harbour HIV-1, as a latent infection, making brain as a sanctuary site for HIV-1 as most of the HAART drugs do not reach the brain tissue. The speaker will describe trafficking of HIV-1 into brain, and discuss how cell and molecular biology approaches can be used to study the effect of HIV-1 viral proteins on neuronal damage that lead to cognitive and motor deficits in AIDS patients. The speaker will also touch upon the novel insights that are gained in last decade on our understanding how HIV-1 viral proteins stall the human neural stem proliferation/differentiation.