

Replication of immunodeficiency virus in humans

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The <u>acquired immunodeficiency syndrome</u> (AIDS) pandemic is caused by the <u>human immunodeficiency virus</u> (HIV-1), which attacks the immune system and leaves infected individuals susceptible to opportunistic infections. AIDS and HIV-1 are thought to have a relatively short history in humans, with the first infections likely occurring around the turn of the 20th century.

HIV-1 is derived from highly related simian immunodeficiency viruses (SIVs) that infect modern primates, including chimpanzees. SIVs must have crossed the <u>species barrier</u> to infect humans at some point in the past, but the molecular adaptations that permitted a new host are unknown. Drs. Beatrice Hahn and Frank Kirchoff led an international research effort to understand what adaptations allow a chimpanzee strain of SIV to replicate in human tissues.

They found that SIV is capable of replicating in human immune tissues, but that replication occurs at very low levels. By introducing a single amino acid change into the SIV Gag protein, a structural protein that makes up the viral capsid, the research team found that <u>viral replication</u> in cultured human tissues increased dramatically, while replication in chimpanzee-derived <u>immune cells</u> was decreased.



Their work indicates that species-specific adaptation of Gag is critical for viral replication efficiency and suggests that changes in Gag potentially played a role in the emergence of HIV/AIDS.

More information: Efficient SIVcpz replication in human lymphoid tissue requires viral matrix protein adaptation, <u>www.jci.org/articles/view/6142 ... b299fdfbdc1c9633aa06</u>

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