

What is HIV?

The Human Immunodeficiency Virus (HIV) is a type of lentivirus (Figure 1) which is the cause of the disease Acquired Immunodeficiency Syndrome (AIDS). HIV is a virus which attacks the CD4 immune cells of the individual affected and uses them to replicate itself to produce even more HIV viruses [1]. Gradually over the course of infection the number of CD4+ cells decrease and eventually leads to death [2].

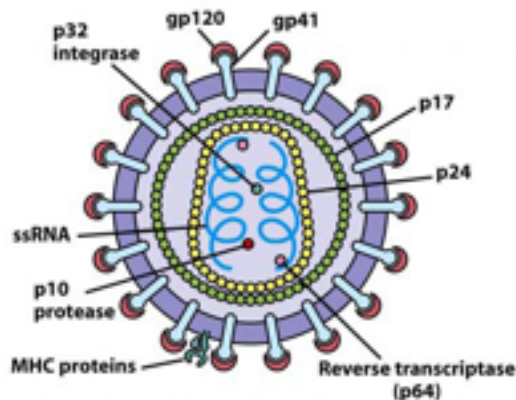


Figure 1: Anatomy of HIV. Photo credits: www.microbeonline.com

History of HIV

AIDS was first recognized as a new disease back in 1981 in a number of homosexual men. The virus, named HIV-1, spread at a fast pace around the world and was studied intensely back then. A second type of HIV called HIV-2 was also discovered in 1986, which was slightly different from HIV-1 but at the same time very similar to a type of virus that caused immunodeficiency in primates [3]. In figure 2, we can see the different types of simian (primate) immunodeficiency viruses and how it is linked to humans:

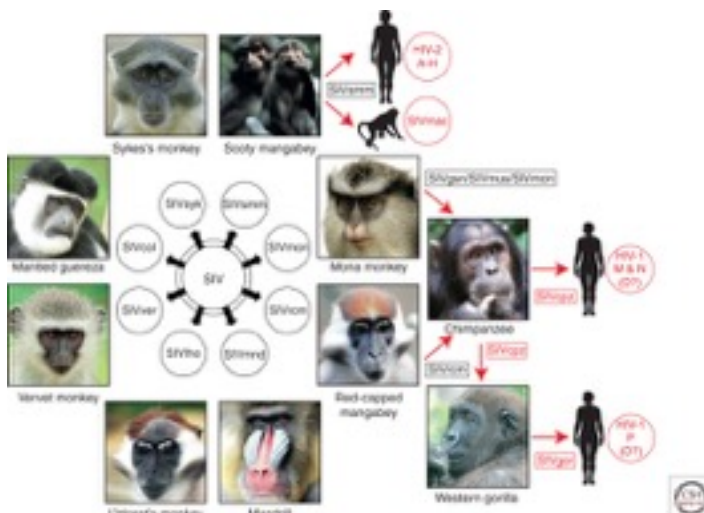


Figure 2: Relation and possible links between human and primate immunodeficiency viruses. Photo credits: Paul M. Sharp and Beatrice H. Hahn^[3].

How exactly HIV (or at least the viruses which were closely related to HIV) got transmitted from monkeys to humans is still being studied.

How does HIV spread and kill?

HIV spreads mainly through bodily fluids and any activity which involves exchange of fluids between an infected person and a healthy person. The most common way that HIV is transmitted is through sexual intercourse between an infected individual and another (or more) partners. As the symptoms of HIV does not surface until many years later after infection (in a phase known as the incubation period), the infected individuals may not even know they are infected and continue spreading the virus. Another common method of transmission is through the usage of needles, either in hospitals which are not sanitized enough or injection of drugs. Reusage or sharing of needles can potentially transfer HIV from one individual to another. Blood donations are another slightly less common way of HIV transmission. Infected mothers can pass on the HIV virus to their child if pregnant while infected, and the child will be born with HIV and most do not live very long ^[4].

HIV infection usually leads to full blown AIDS in a few years and is usually a death sentence for the victim. As mentioned above, HIV destroys CD4+ cells which are vital to the body's defenses against external microbes. This causes the body's immune mechanism to fail over time, and pathogens that are normally harmless and destroyed by the immune system can now pose a serious threat to the body, and over time it leads to organ failures and opportunistic infections by other pathogens and viruses. Even while symptoms do not show in the incubatory period the CD4+ cell count gradually decreases over time. Generally, healthy individuals have about 800 – 1200 CD4+ cells per mm³ of blood, while AIDS patients tend to have only 50 or less per mm³ of blood ^[5]. As of today there has been no sure cure of AIDS yet and thus infection by HIV more or less guarantees death.