Characteristics of HIV, the AIDS virus

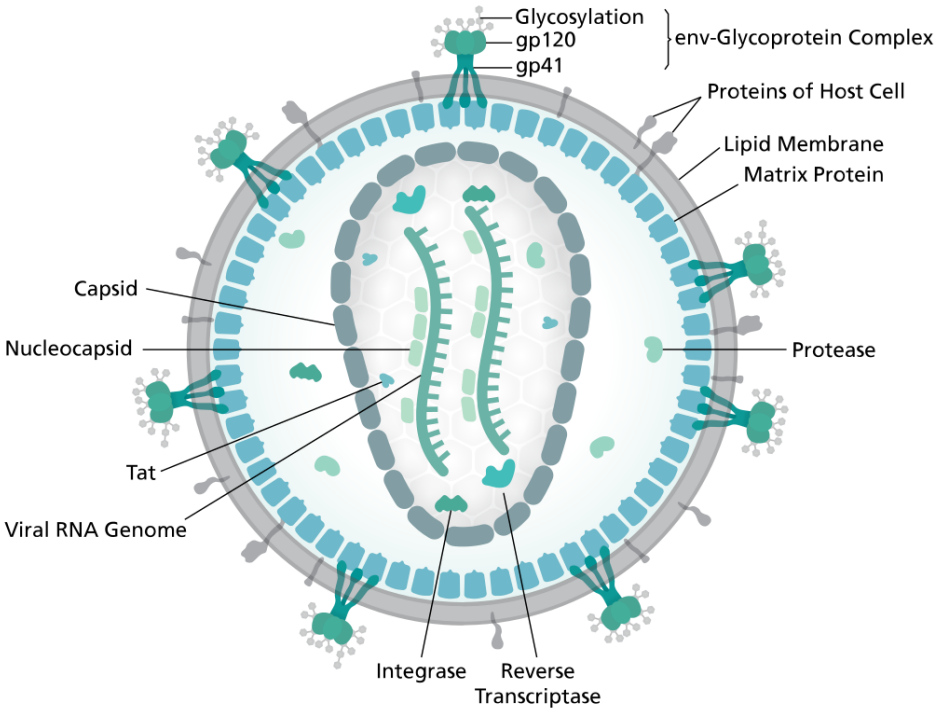
Warning

Reading this document denounces **the death trap represented by the presence of HIV1, the AIDS virus, in the ChAdOx1 nCoV-19 vaccine**, which they wanted to administer to us. Because **one of the characteristics of this HIV1 retrovirus, the AIDS virus, is to integrate it into the DNA of the human genome for life**. In fact, **the reverse transcriptase**, or retrotranscriptase, **of HIV1** is an enzyme which **transcribes the genetic information of HIV1 supported by its RNA into corresponding DNA, which will become irreversibly integrated into the genome of the host.**

***HIV infects vital cells of the human immune system, such as CD4 + T cells (T4 lymphocytes), macrophages and dendritic cells. HIV infection leads to the death of CD4 + T lymphocytes through a number of mechanisms. When the number of CD4 + T lymphocytes drops below a critical level, cell-mediated immunity is lost and the body gradually becomes more susceptible to opportunistic infections, leading to the development of AIDS*.**

The human immunodeficiency virus

Structure



The human immunodeficiency viruses (HIV)

HIV1 is a retrovirus of the lentivirus genus (from Latin lentus "slow"), which is characterized by a long incubation period with, consequently, a slow course of the disease.

HIV-1 is a spherical virus with an average diameter of 145 nanometers. Like many viruses that infect animals, it has an envelope made up of a fragment of the membrane of the infected cell. In this lipid envelope are inserted trimers of envelope glycoprotein (Env). Each Env protein is made up of 2 subunits: a gp120 surface subunit and a gp41 transmembrane subunit. The surface of an HIV virus would contain on average only 14 Env40 trimers. **When the virus attaches to the cell, the Env gp120 protein binds to a CD4 receptor found on the surface of CD4+ cells of the immune system**. It is for this reason that HIV only infects cells with this receptor on their surface, the vast majority of which are CD4+ lymphocytes.

HIV infects vital cells in the human immune system, **such as helper T cells** (specifically **CD4+ T cells**), macrophages, and dendritic cells. **HIV infection leads to low levels of CD4+ T cells** through a number of mechanisms, including pyroptosis of abortively infected T cells, apoptosis of uninfected bystander cells, direct viral killing of infected cells, and **killing of infected CD4+ T cells by CD8+ cytotoxic lymphocytes,** that recognize infected cells. **When CD4+ T cell numbers decline below a critical level, cell-mediated immunity is lost**, **and the body becomes progressively more susceptible to opportunistic infections, leading to the development of AIDS**.

Inside the envelope is a protein matrix (MA) made up of p17 proteins and, again inside, the capsid (CA) made up of p24 proteins. It is the latter type of protein which, along with gp41 and gp120, are used in HIV western blot tests. The p7 core proteins (NC) protect the viral RNA by coating it. The p6 protein is excluded from the capsid and is located between the matrix and the capsid, it allows the release by budding of the newly formed viruses in the cell.

The HIV genome, contained in the capsid, **consists of a single strand of RNA in duplicate (9181 nucleotides)**, accompanied by enzymes:

- **Reverse transcriptase,** or retrotranscriptase**, which retrotranscribes viral RNA into viral DNA.**

- **Integrase** which **integrates viral DNA into cellular DNA**.

- **The protease** which participates in the assembly of the virus by cleaving the protein precursors Gag p55 and Gag-Pol p160. Protease is present in the capsid.

These three enzymes are the main targets of antiretroviral therapy because they are specific to retroviruses.

The HIV genome is made up of nine genes. The three main ones are gag, pol and env, which define the structure of the virus and are common to all retroviruses. The other six genes are tat, rev, nef, vive, vpr, and vpu, which encode regulatory proteins.

Transmission

HIV is present in many body fluids. It has been found in saliva, tears and urine, but in insufficient concentrations for transmission to be recorded. Transmission by these fluids is therefore considered negligible. On the other hand, quantities of HIV large enough to trigger an infection were detected in the blood, breast milk, love juice, semen, as well as the liquid before ejaculation and the concentration of the virus in genital secretions (semen and secretions in the cervix in women) are good predictors of the risk of passing HIV to another person.

Consequently, the three modes of contamination are:

- unprotected sex. Whether they are heterosexual or homosexual, they represent the most important part of contaminations

- contact with contaminated material at:

- drug addicts, by injection

- tattoos, due to poor equipment hygiene

- transfused

- health personnel

- mother-to-child transmission, during pregnancy, during childbirth and during breastfeeding. Without treatment and with natural childbirth, the transmission rate varies, depending on the study, between 10 and 40%. The risk of infection is highest during childbirth (65% of all cases of infection). Treatment and the possible practice of a cesarean section can lower this figure to 1%.

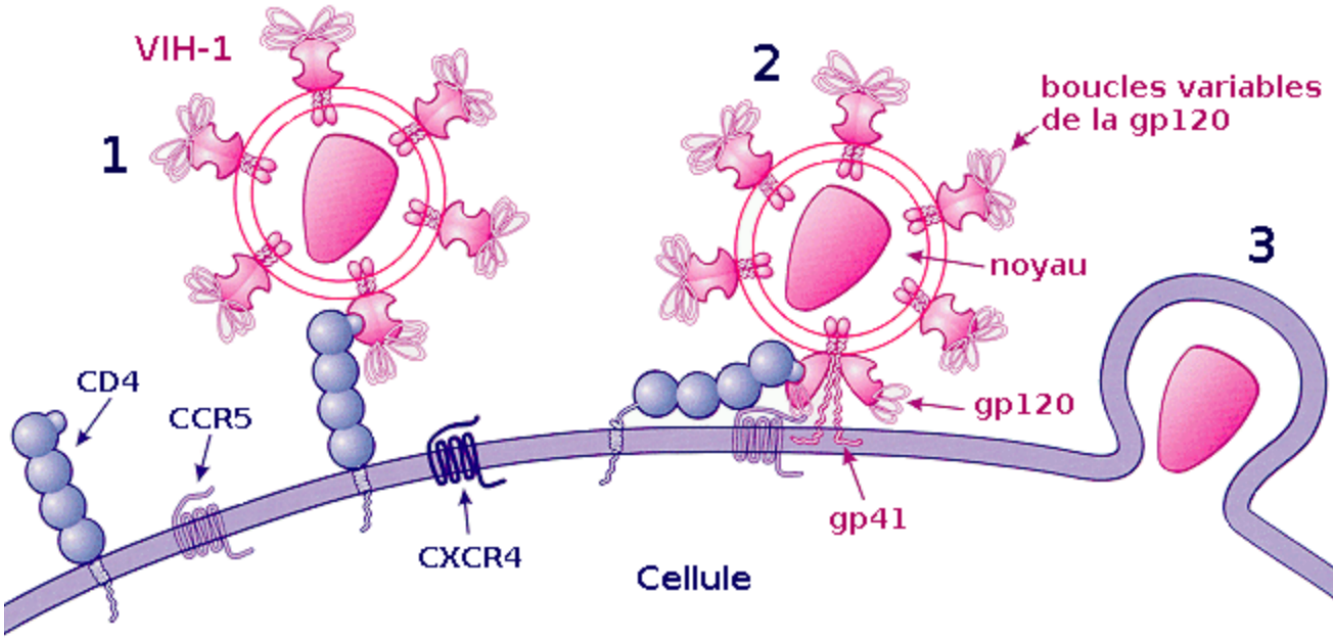
Replication cycle

HIV target cells are those with CD4 receptors on their surface. Thus, CD4 + T lymphocytes, macrophages, dendritic cells and brain microglial cells can become infected with HIV. Thus, viral replication takes place in several tissues.

Replication of the virus takes place in several stages:

Fixation or attachment to a cell

This step is based on recognition between the proteins of the gp120 viral surface and the CD4 receptors of the target cell. After union with a CD4 receptor, gp120 changes its conformation and is attracted to a co-receptor which must also be present next to the CD4 molecule. More than ten co-receptors have been identified, but the main ones are CXCR4 for CD4 + T lymphocytes and CCR5 for macrophages.



HIV attachment process

1- Attachment of the gp 120 to the CD4 receiver

2- Attachment of a variable loop of gp 120 to the co-receptor and attachment of gp 41 to the cell membrane

3- Penetration into the cell