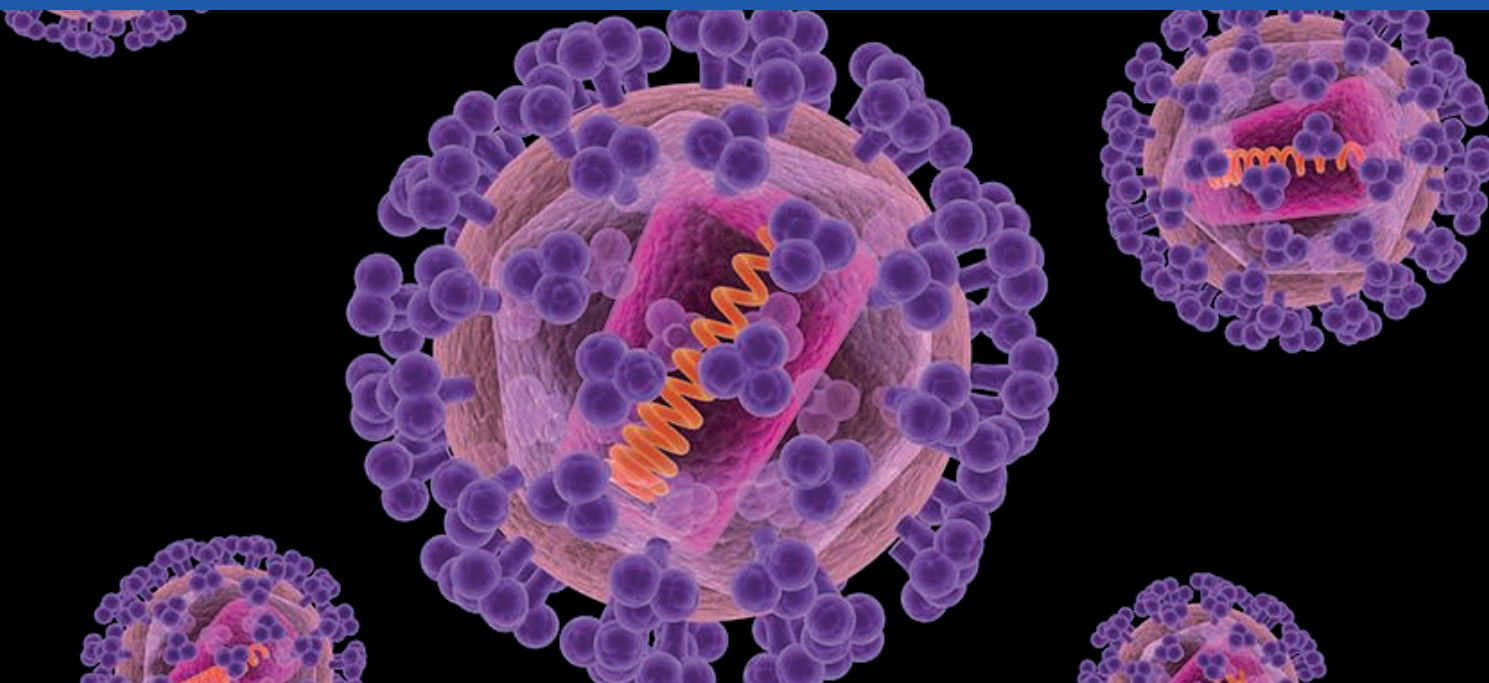


HIV LIFE CYCLE



The goal of antiretroviral therapy (ART) is to suppress HIV and, by doing so, to make sure that people living with HIV can enjoy long and healthy lives. To understand how ART works, it is important to first understand how HIV infects the body once the virus has entered it. This is called the life cycle of HIV.^{1,2}

Most commonly, the virus enters the body when an HIV-negative person has unprotected sex with an HIV-positive person with a virus that is not suppressed.

1. BINDING: HIV makes its way to the body's CD4 cells – the cells that fight infection – and the virus attaches to the outer wall of the cell.

2. FUSION: The virus fuses (joins together) with the CD4 cell, enters it and releases its contents (HIV RNA, where it carries its genes, and proteins/enzymes which will help to make more HIV) inside the CD4 cell.

**Fusion and entry inhibitors are HIV medicines (ARVs) that block this step of the HIV lifecycle, stopping multiplication of the virus eg Tenofovir, Efavirenz.*

3. REVERSE TRANSCRIPTION: One of the released viral materials is a protein called **reverse transcriptase** that allows the virus's genetic material to change from HIV RNA to HIV DNA.

**The nucleoside/nucleotide reverse transcriptase inhibitors and non-nucleoside reverse transcriptase inhibitors are ARVs that block this step, stopping multiplication of the virus.*

4. INTEGRATION: The HIV DNA travels to the nucleus (the 'heart') of the CD4 cell where it uses another viral material, **integrase**, to combine the HIV DNA to the CD4 cell DNA.

**The integrase inhibitors are ARVs that block this step, stopping the virus from making more of itself e.g., dolutegravir and raltegravir.*

5. REPLICATION: Once HIV and CD4 cell DNA have combined, HIV uses the CD4 cell's machinery to produce long chains of HIV proteins. The HIV proteins are the building blocks of the new virus. **New ARVs are being developed to block this step, stopping the virus from making more of itself, e.g., lenacapavir.*

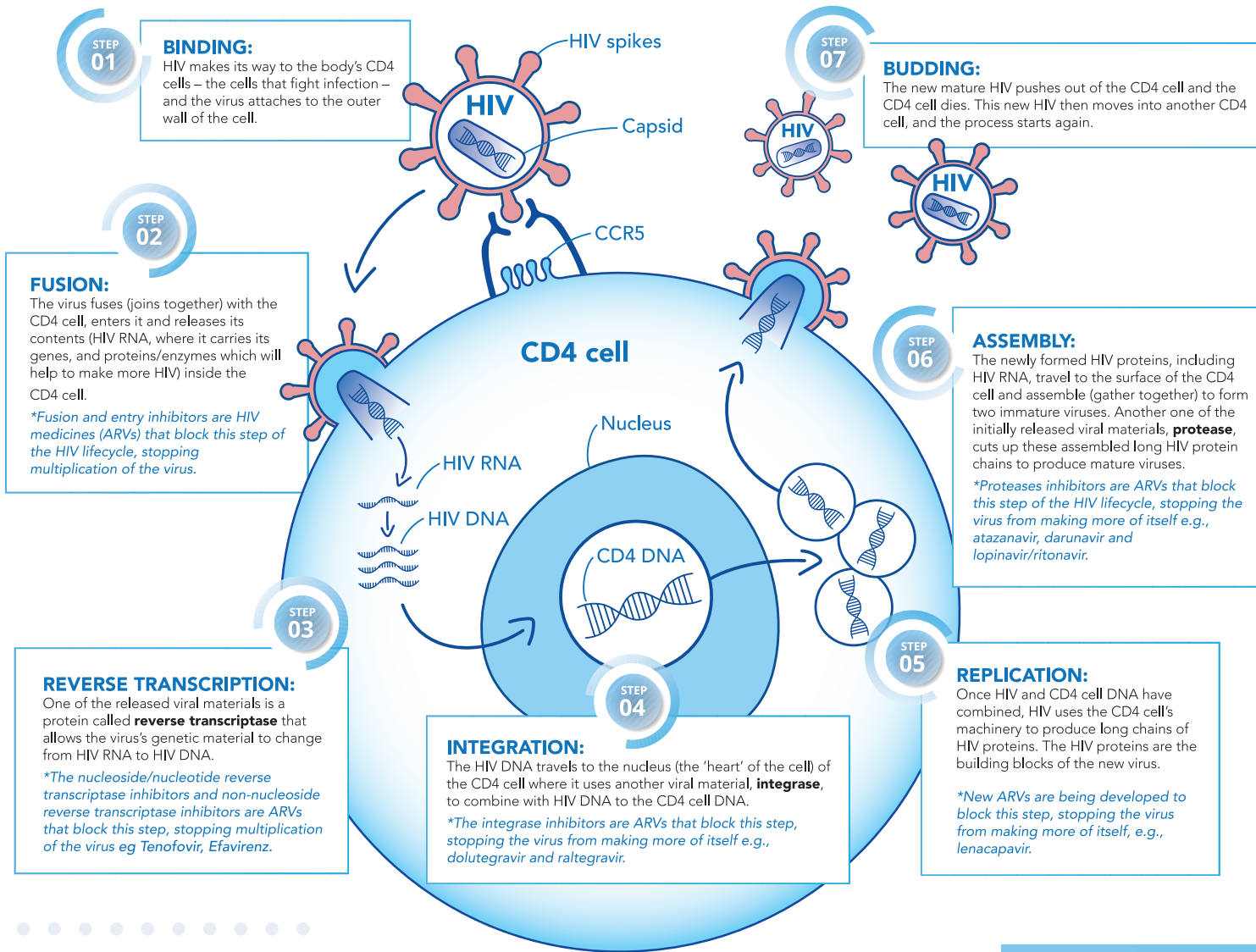
6. ASSEMBLY: The newly formed HIV proteins, including HIV RNA, travel to the surface of the CD4 cell and assemble (gather together) to form two immature viruses. Another one of the initially released viral materials, **protease**, cuts up these assembled long HIV protein chains to produce mature viruses. **Proteases inhibitors are ARVs that block this step of the HIV lifecycle, stopping the virus from making more of itself e.g., atazanavir, darunavir and lopinavir/ritonavir.*

7. BUDDING: The new mature HIV pushes out of the CD4 cell and the CD4 cell dies. This new HIV then moves into another CD4 cell, and the process starts again.

- **ART (antiretroviral therapy)** is the medicines that are taken to keep HIV under control.
- The **ART** are made up of **ARVs (antiretrovirals)** from at least two different classes which block **HIV (human immunodeficiency virus)** at different stages of the HIV life cycle.¹
- The **ARVs** can be given as separate medicines or combined into one tablet or **FDCs (fixed dose combinations)**. The goal of antiretroviral therapy (ART) is to suppress HIV and, by doing so, to make sure that people living with HIV can enjoy long and healthy lives.
- **HIV** is a virus that attacks the immune cells that fight infection called **CD4 cells**.
- **HIV** uses **CD4 cells** to multiply and spread throughout the body.

THIS PROCESS IS CALLED HIV REPLICATION. IT HAPPENS BILLIONS OF TIMES A DAY, IF A PERSON IS NOT ON ART (AND TAKING IT CORRECTLY).³

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GLOSSARY^{4,5}

ART (antiretroviral therapy): made up of three or more ARVs from at least two different classes which block HIV at different stages of the HIV lifecycle.

ARV (antiretrovirals): the medicines that are taken to keep HIV under control. Taking them correctly will keep the virus at a low level, allow the immune system to work, and minimise the risk of passing HIV to others.

CD4: cells that fight infection. The CD4 count gives a measure of how well the immune system is working.

DNA (deoxyribonucleic acid): the material inside the nucleus ('heart') of cells which stores the genetic material.

HIV (Human Immunodeficiency Virus): a virus that attacks the CD4 cells making it hard for the body to fight infections.

RNA (ribonucleic acid): the structure that carries the genetic material of some viruses, like HIV.

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For more information on HIV,
point your phone camera here >



**THERE IS NO CURE FOR HIV YET, BUT IT IS TREATABLE WITH ARVS.
WHEN ARV'S ARE TAKEN PROPERLY AND CONSISTENTLY,
PEOPLE WITH HIV CAN LIVE LONG AND HEALTHY LIVES.**

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