

- 1) HIV's extracellular, or virion stage
- 2) HIV's gp120 protein binds to CD4 and coreceptor on host cell

- 3) HIV's RNA genome, **reverse transcriptase**, integrase, and protease enter host cell

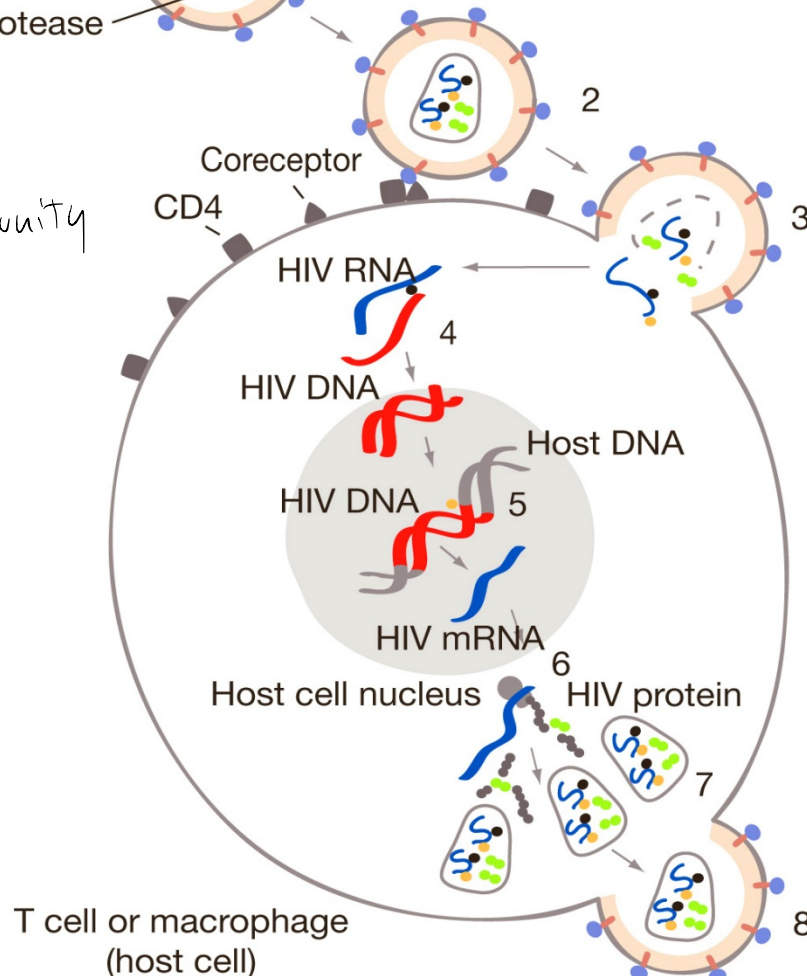
- 4) Reverse transcriptase synthesizes HIV DNA from HIV's RNA template

- 5) Integrase splices HIV DNA into host genome. HIV DNA is transcribed to HIV mRNA by the host cell's RNA polymerase

- 6) HIV mRNA is translated to HIV precursor proteins by host cell's ribosomes. Protease cleaves precursors into mature viral proteins

- 7) New generation of virions assembles inside host cell

- 8) New virions bud from host cell's membrane



RNA virus

- Human immunity system

→ retrovirus

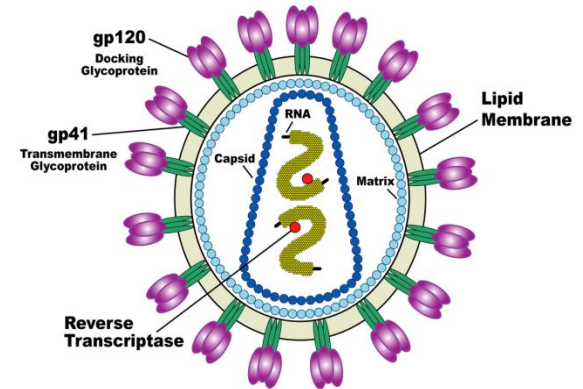
## How HIV causes AIDS

HIV invades immune system cells especially helper T cells.

These helper T cells have a vital role in the immune system.

Stimolano i linfociti B a produrre anticorpi

When a helper T cell is activated (by having an antigen [a piece of foreign protein] presented to it) it begins to divide into memory T cells and effector T cells.



# Why is HIV hard to treat?

## Viral disguise

(indeboliscono)

Killer T cells deplete helper T cells (those that produce memory cells that can remember and recognize HIV).

Loss of helper T cells is costly, but the immune system now <sup>(attivato)</sup> primed to recognize and attack the viral protein.

What's the problem?

you can't kill the virus,  
you have to kill the cells that  
contains the virus






## Why is HIV hard to treat?

### Viral disguise

Virus mutates and the proteins on its outer surface change.

These new surface proteins are not recognized by the immune system's memory cells.

Mutant virus particles bearing new surface proteins survive immune system attack and begin new round of infection



Each round of infection reduces numbers of helper T cells because they are infected by virus and destroyed.

Furthermore, because each lineage of T cells has a limited capacity for replication, after a finite number of rounds of replication the body's supply of helper T cells becomes exhausted. The immune system eventually is overwhelmed and collapses.

Link a video:

<https://m.youtube.com/watch?v=5g1ijpBI6Dk>