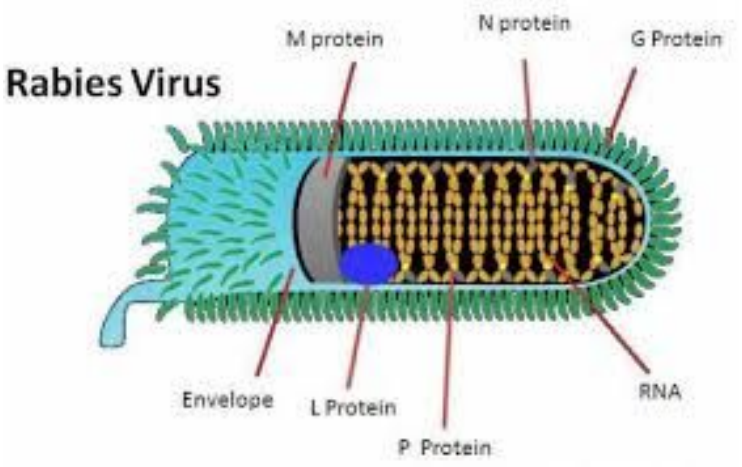
An **RNA virus** is a virus that has RNA (ribonucleic acid) as its genetic material. This nucleic acid is usually single-stranded RNA (ssRNA), but may be double-stranded RNA (dsRNA). Notable human diseases caused by RNA viruses include Ebola hemorrhoragic fever, Zika fever, influenza, hepatitis C, West Nile fever, polio, pneumonia and measles.

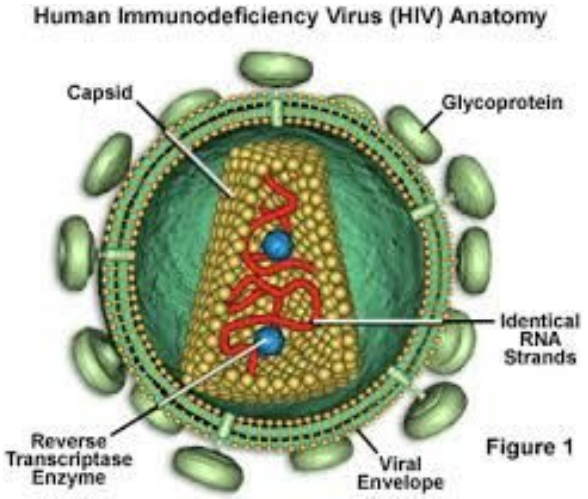
Viruses with RNA as their genetic material but that include DNA intermediates in their replication cycle are called retroviruses.

Notable human retroviruses include HIV-1 and HIV-2, the cause of the disease AIDS.

Another term for RNA viruses that explicitly excludes retroviruses is **ribovirus**.



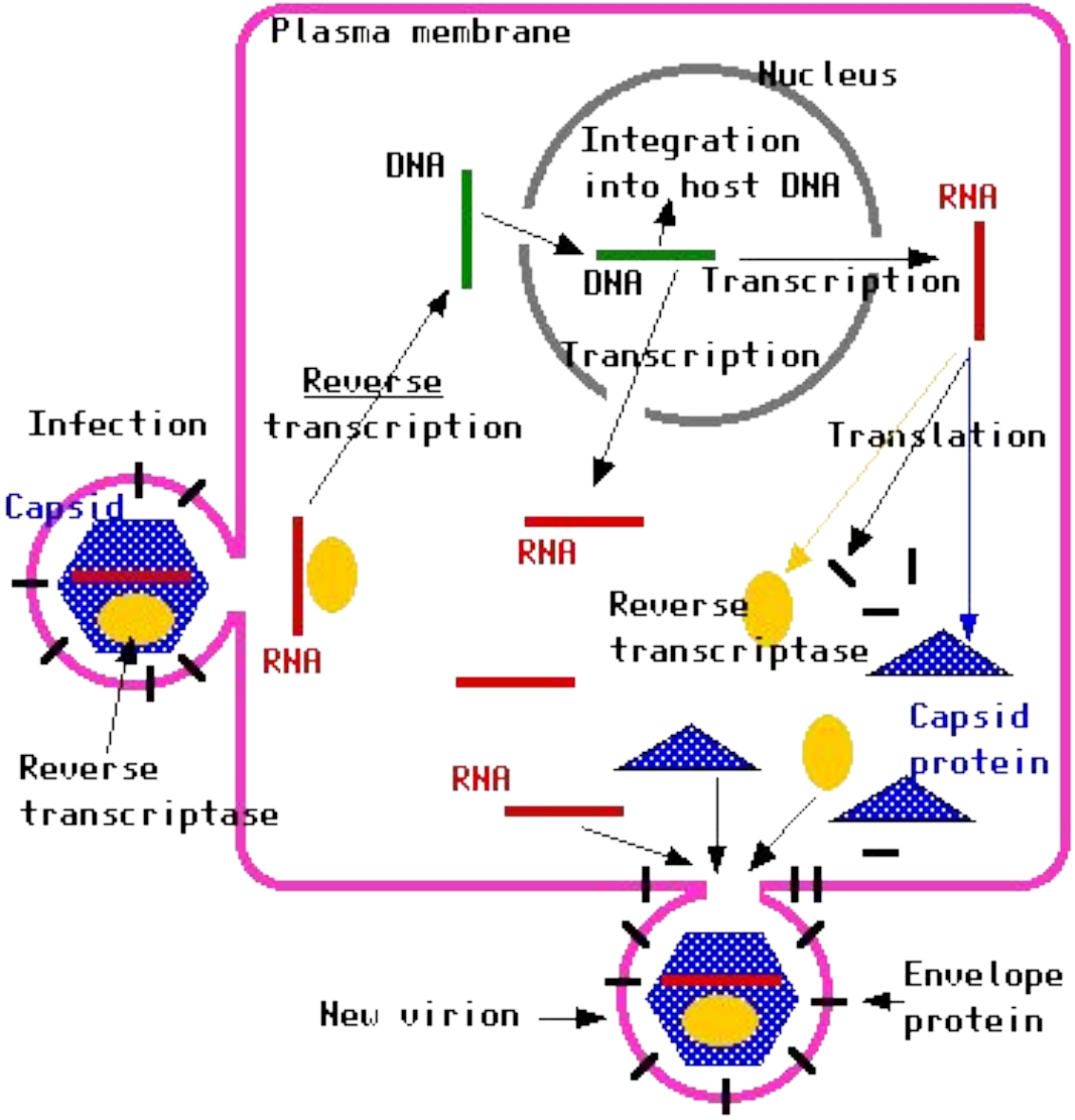
RNA ribovirus



HIV RNA retrovirus

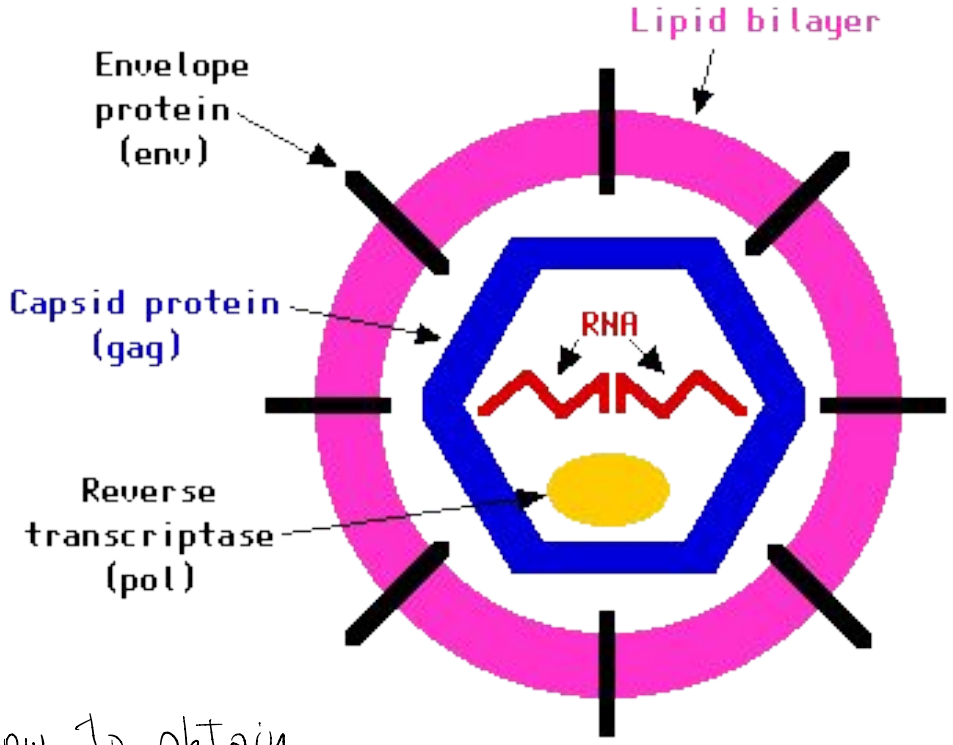
Retrovirus

- Change RNA into DNA.
- Example of a Retrovirus is HIV



A typical, "minimal" retrovirus consists of:

- an outer envelope which was derived from the plasma membrane of its host
- a capsid; a protein shell containing two molecules of RNA
- molecules of the enzyme reverse transcriptase



↳ allow to obtain DNA from RNA ~ only viruses can do this

https://www.bing.com/videos/search?q=hiv+virus&&view=detail&mid=C7D8E76EF1E4D026F886C7D8E76EF1E4D026F886&&FORM=VRDGAR

Lytic Cycle

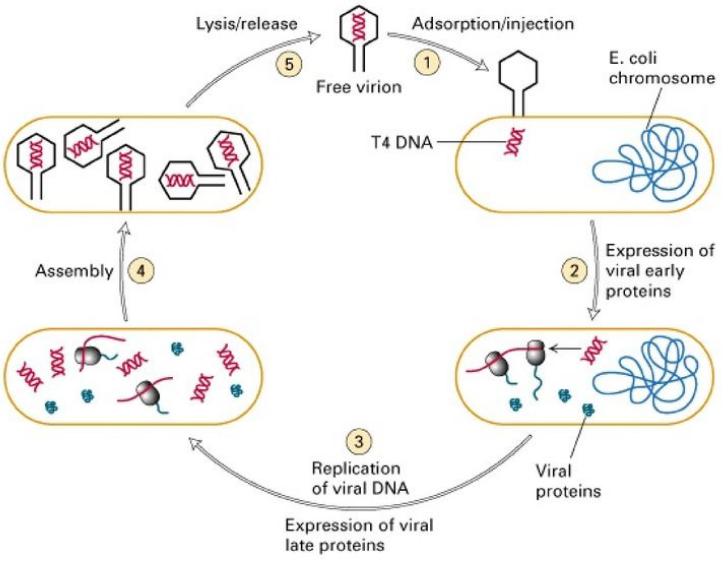
In bacterial viruses, the cycle of viral infection, replication, and cell destruction is called the **lytic** cycle.

After the viral genes have entered the cell, they use the host cell to replicate viral genes and to make viral proteins, such as capsids.

The proteins are then assembled with the replicated viral genes to form complete viruses. The host cell is broken open and releases newly made viruses.

Ciclo litico di un batteriofago

Anche nelle intenzioni delle cellule degli eucarioti il ciclo litigo funziona in questo modo.

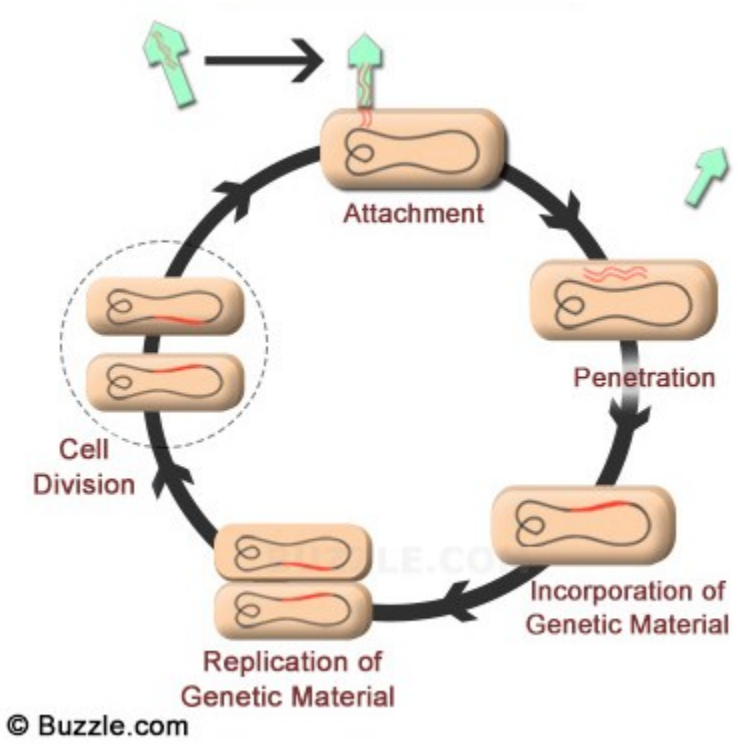


Lysogenic Cycle

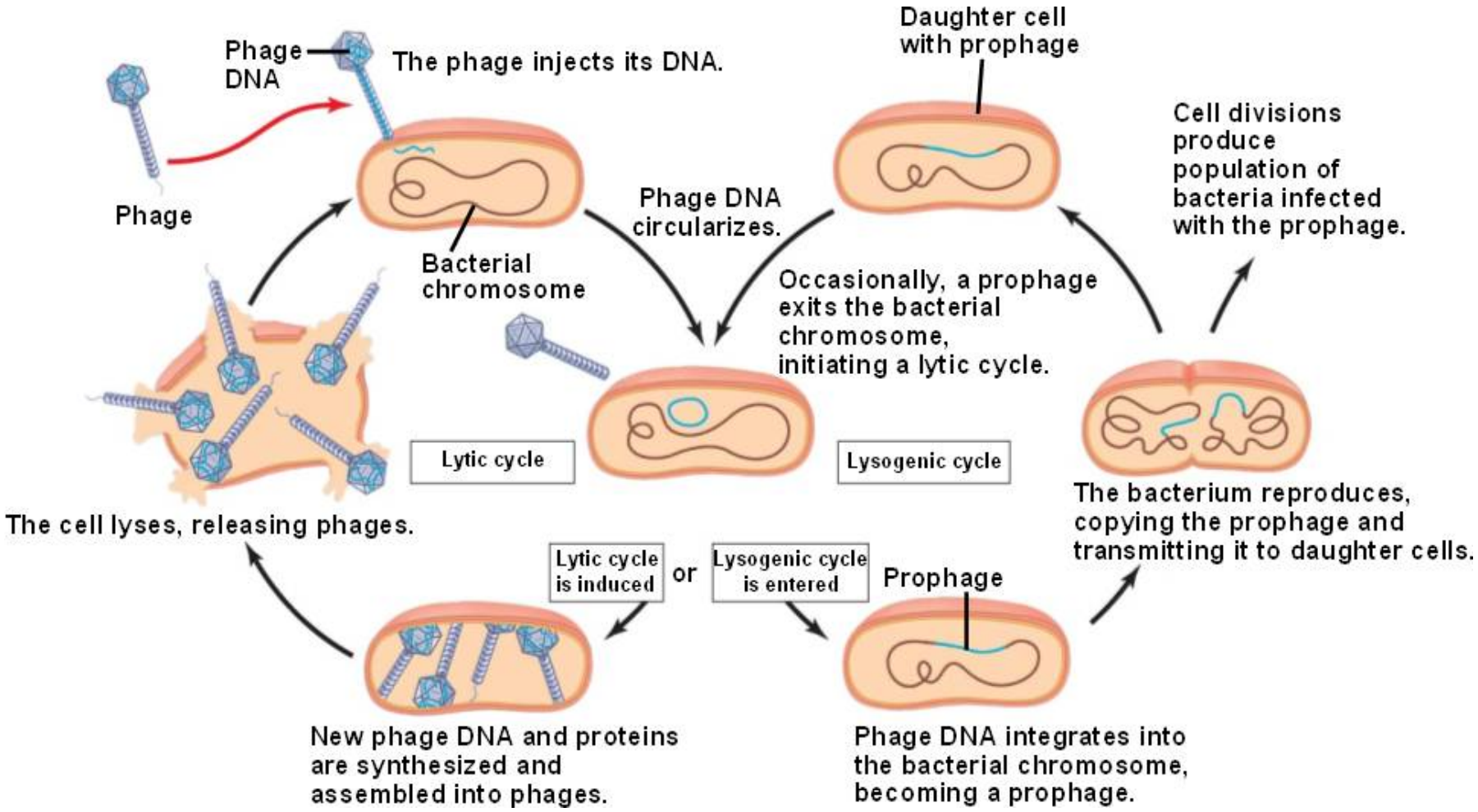
During an infection, some viruses stay inside the cells but instead of producing virus particles, the viral gene is inserted into the host chromosome and is called a **provirus**. → il virus

Whenever the cell divides, the provirus also divides, resulting in two infected host cells.

In this cycle, called the **lysogenic** cycle, the viral genome replicates without destroying the host cell.



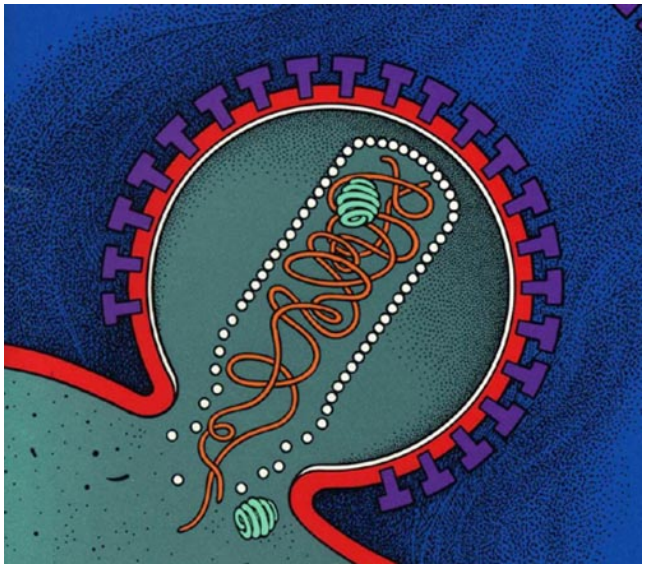
Cycle of Lytic and Lysogenic

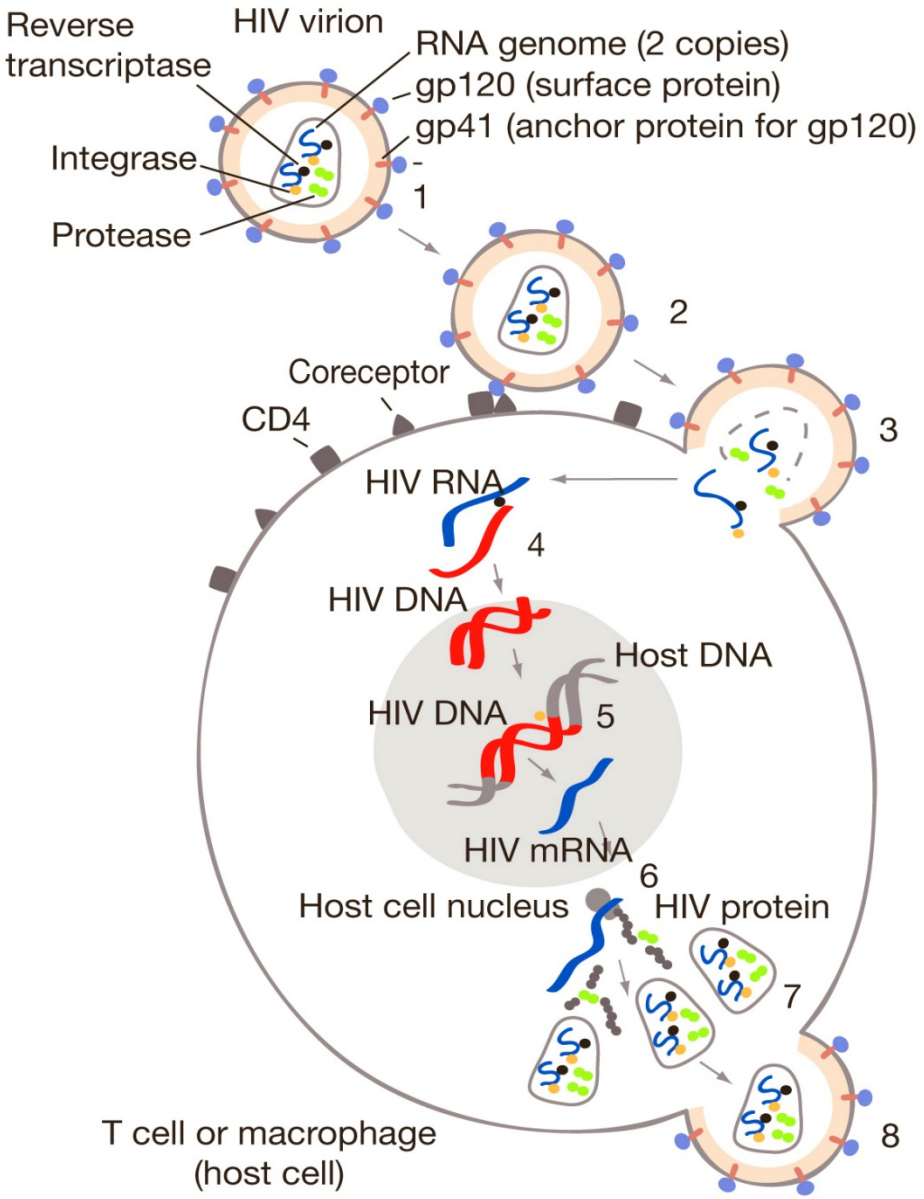


https://www.bing.com/videos/search?q=virus+lytic+cicle&&view=detail&mid=D73614551A9352DF1DE8D73614551A9352DF1DE8&&FORM=VDRVRV

The Human Immunodeficiency Virus

HIV, like all viruses, is an intracellular parasite.
Parasitizes macrophages and T-cells of immune system
Uses cells enzymatic machinery to copy itself. Kills host cell in process.
Host cell membrane and viral coat fuse and virus contents enter cell.





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