HIV Infections and AIDS

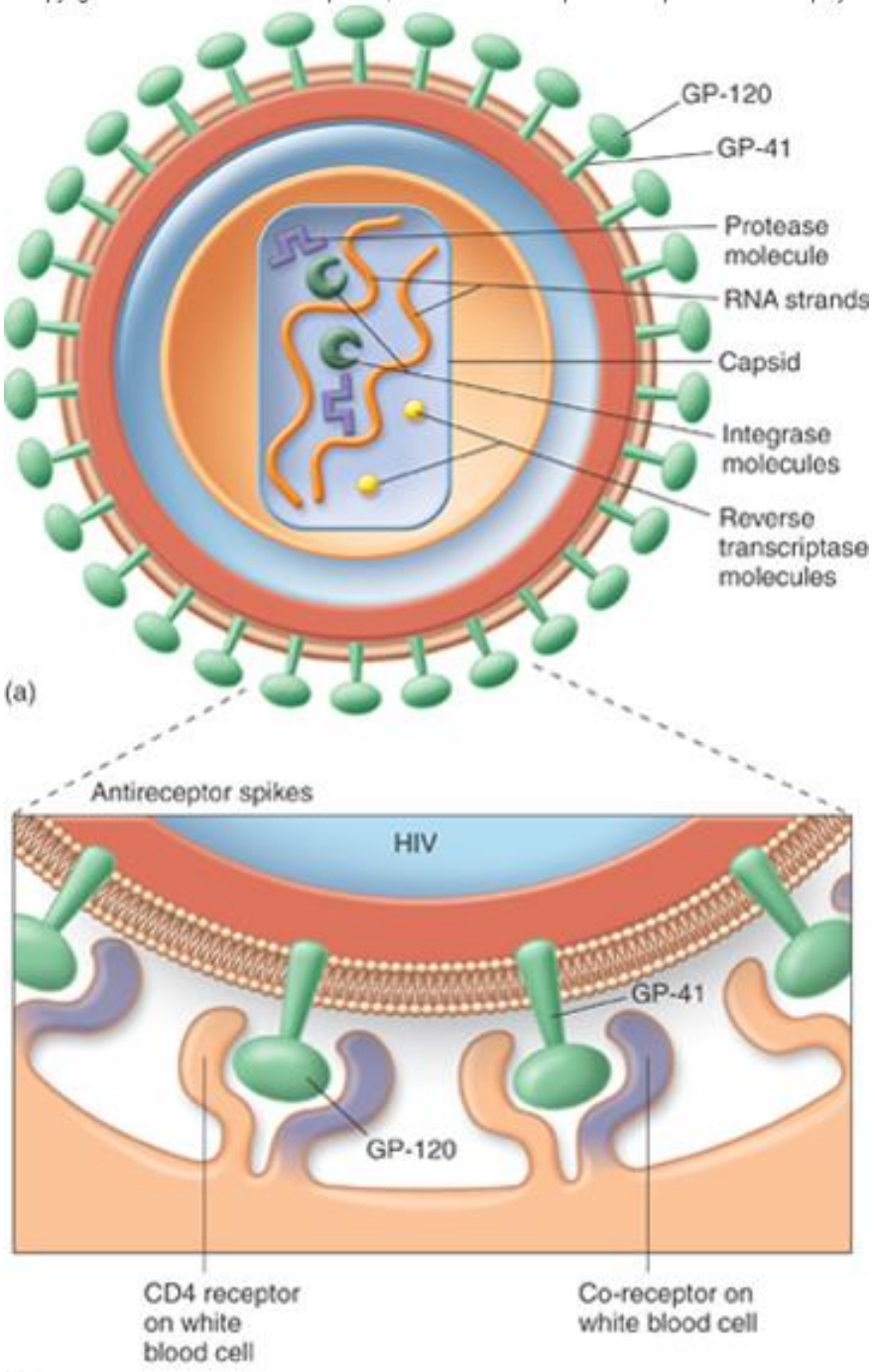
- Human immunodeficiency virus
- Acquired Immuno Deficiency syndrome
- First emerged in early 1980s
- HIV-1 may have originated from a chimpanzee virus.
- 1959 first documented case of AIDS

Life cycle of Animal Viruses

- Attachment
- Penetration
- Uncoating
- Biosyntehsis
- Release

Causative Agent

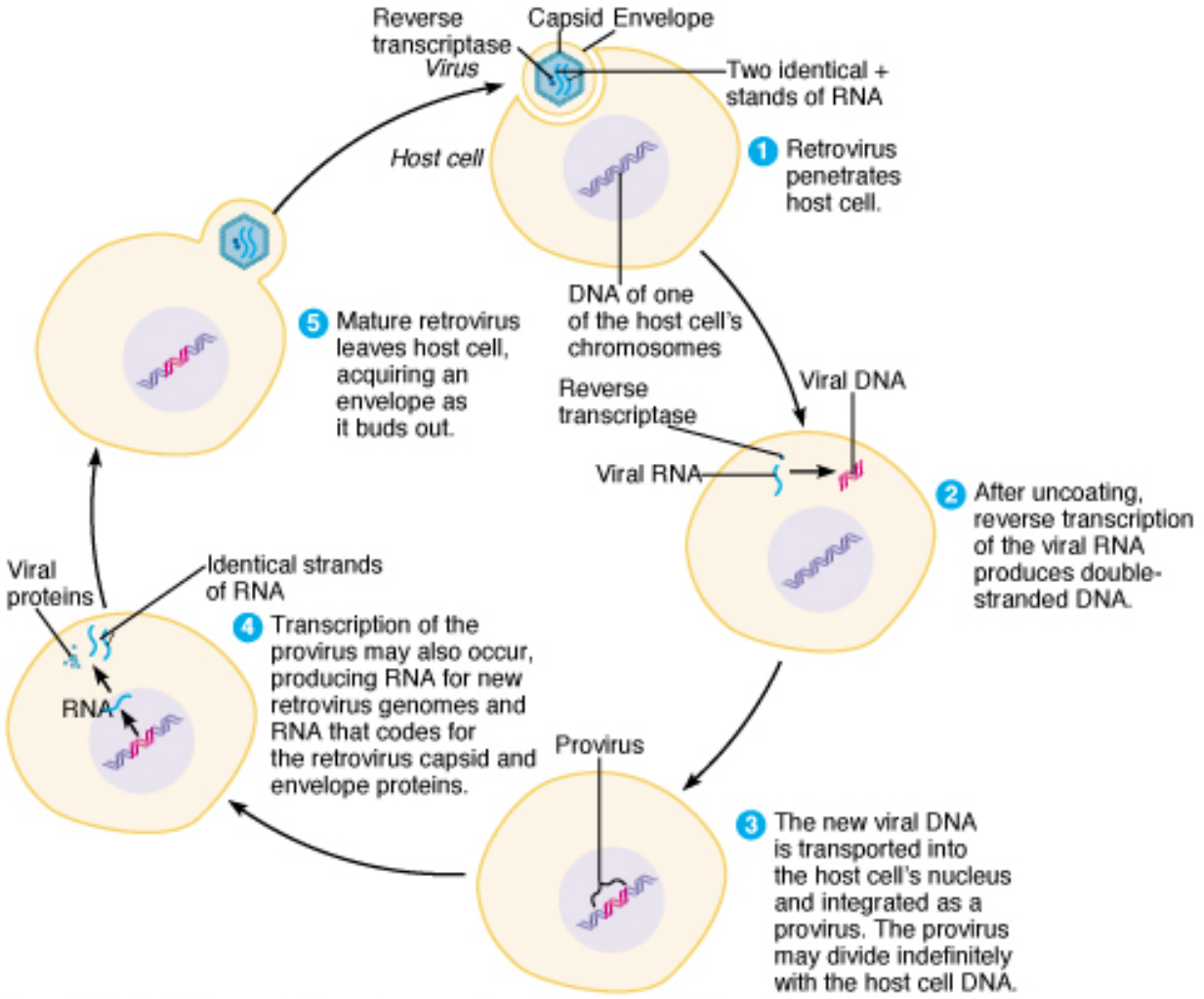
- Retrovirus, genus Lentivirus
- Encode reverse transcriptase enzyme which makes a double stranded DNA from the single-stranded RNA genome
- Viral genes permanently integrated into host DNA-proviral DNA
- Human Immunodeficiency Virus (HIV) the cause of Acquired Immunodeficiency Syndrome (AIDS)
- HIV-1 and HIV-2
- T-cell lymphotropic viruses I and II – leukemia and lymphoma
- HIV can only infect host cells that have the required CD4 marker plus a coreceptor.



HIV structure

- 120 nm enveloped virus: gp160: gp120+ gp41 proteins
- Conical capsid:2000 copies of p24 protein
- Matrix protein p7 encloses the capsid and tightly bound to genome
- 2 identical copies of single stranded positive sense RNA
- Genome size: Linear 9200 bp +ss RNA with 5 methyl cap and 3’ poly A tail
- Carries RT, Integrase, protease within

Retroviridae



Pathogenesis and Virulence Factors of HIV

- HIV enters through mucous membrane or skin and travels to dendritic phagocytes beneath the epithelium, multiplies and is shed.
- Virus is taken up and amplified by macrophages in the skin, lymph organs, bone marrow, and blood.
- HIV attaches to CD4 and coreceptor; HIV fuses with cell membrane.
- Reverse transcriptase makes a DNA copy of RNA.
- Viral DNA is integrated into host chromosome (provirus).
- Can produce a lytic infection or remain latent