

Anbar University

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Biotechnology Department

RNA enveloped viruses

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Virology, Stephen N.J. Korsman, Gert U. van Zyl, ... Wolfgang Preiser
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Jawetz Melnick & Adelbergs Medical Microbiology, Stefan Riedel
(Author), Stephen Morse (Author), Timothy Mietzner (Author), Steve
Miller.

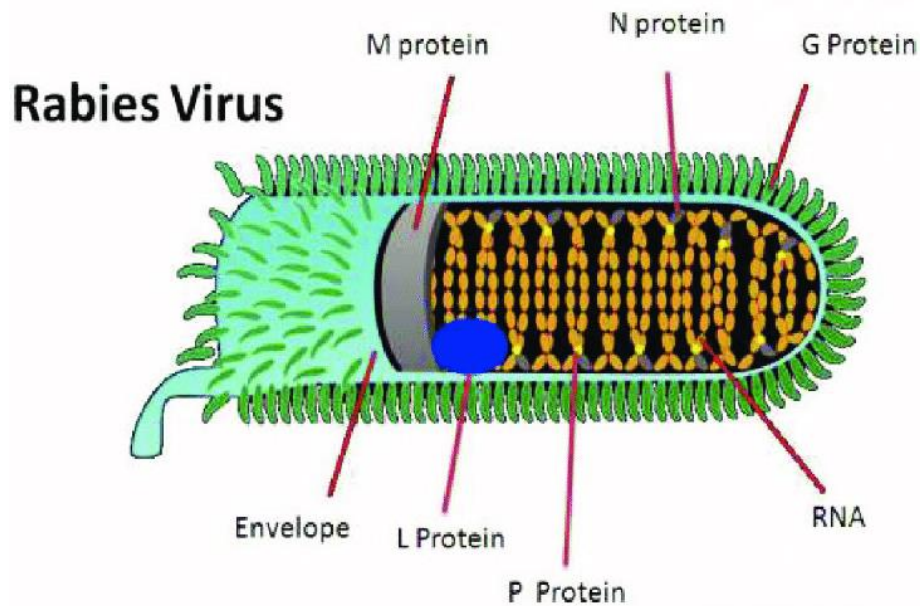
**Viruses, Pandemics, and Immunity, By Arup K. Chakraborty
and Andrey S. Shaw**

RNA-enveloped viruses

Rhabdo viruses Family

Rabies virus

They cause Rabies

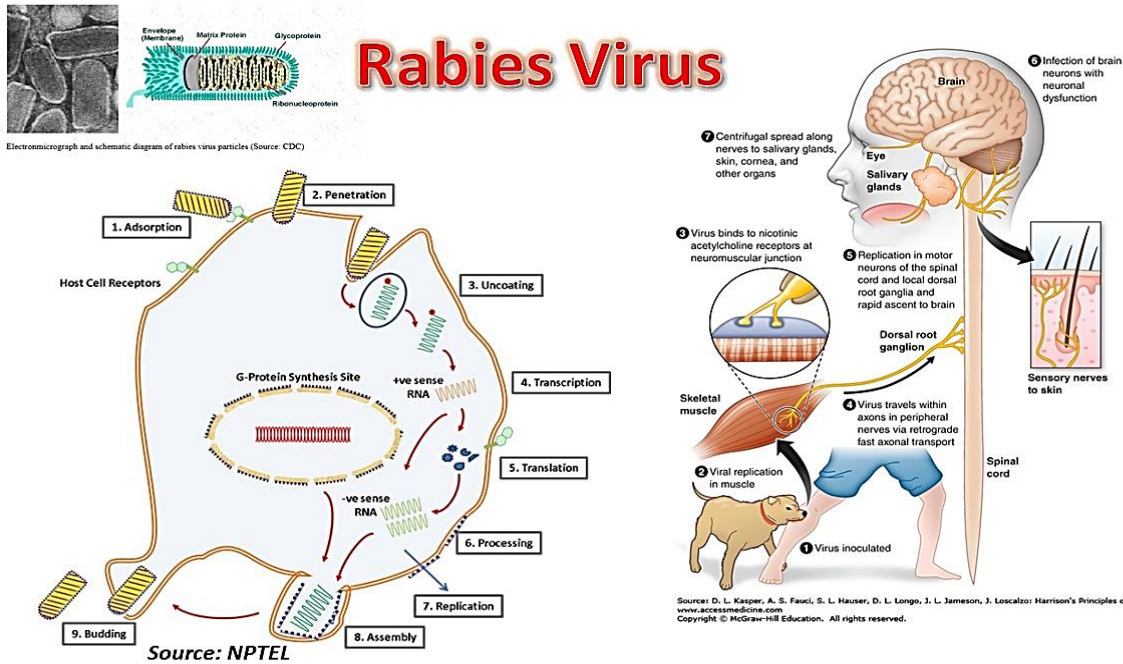


Important properties

- 1- ss-RNA - polarity
- 2- Bullet-shape capsid
- 3- Surrounding by lipoprotein envelope
- 4- Contain RNA-dependent RNA polymerase
- 5- single Antigenic type reside envelope glycoprotein spike
- 6- Infect all mammals
- 7- Virus isolated from animals called street virus, whereas that passages In Rabbit brains is called fixed virus.

Transmission and epidemiology

Virus transmitted by rabid animal dog, cat, and Bat.



Clinical Finding

Clinically the patient exhibit Prodromal nonspecific symptom fever, anorexia, and changes in sensation at bite sit.

After few days

- Confusion
- Increasing salivation discharge
- lethargy

Then

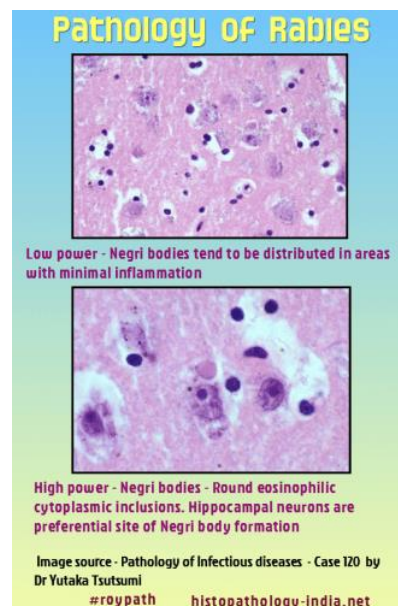
Most notable characteristic Signs

Painful spasm of throat muscles or painful swallowing is result in Hydrophobia.

Within several days disease progresses to Seizures, paralysis, coma, and death occur. By using support system few individual can survived.

Lab diagnosis

- In animals: Rabid diagnosis by examination of brain tissue by histological staining to see negri bodies in the cytoplasm of hippocampal neurons. Isolation of virus on tissue culture but this takes long time.
- In human: negri body can demonstrate in Coronal scrapes or autopsy specimen of Brain.



Treatment

No antiviral therapy and only supportive is available Treatment

- If the animal captured it should be observed for 42 days to see any symptom develop
- Dog and cat should vaccinate by live attenuated vaccine
- Notice. No viremia stage

Retro Viruses including Human immunodeficiency viruses (HIV) causing of AIDS

Lentivirinae

Includes

- 1- human immuno-deficiency virus (HIV - 1)
- 2- human immuno-deficiency virus II (HIV-II)
- 3- simian immune-deficiency virus (SIV -I)

Human immuno-deficiency virus (HIV - 1)

Can causes two diseases immunodeficiency encephalopathy and infect children but no clinical signs in human.

Human immuno-deficiency virus II (HIV-II)

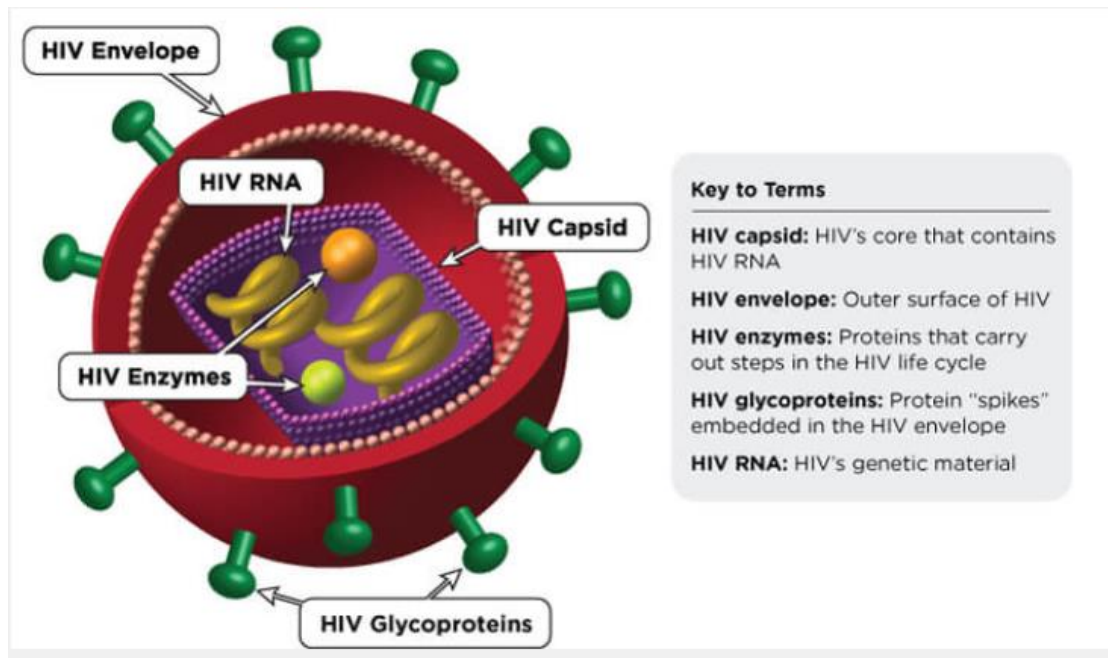
It is genetically closer to simian immunodeficiency virus than to HIV-1. The clinical disease associated with HIV-2 has similar symptoms to HIV-1 infection but progresses at a slower rate to severe immunosuppression.

Simian immune-deficiency virus (SIV -I)

HIV and SIV share molecular biology features, so it is good at study the HIV 1 and 2.

Properties of Lentiviruses

- 1- Non oncogenic
- 2- Spherical in shape with size 80-100 nm
- 3- Single + strand RNA (diploid). all viruses are haploid except this family
- 4- envelope



Replication

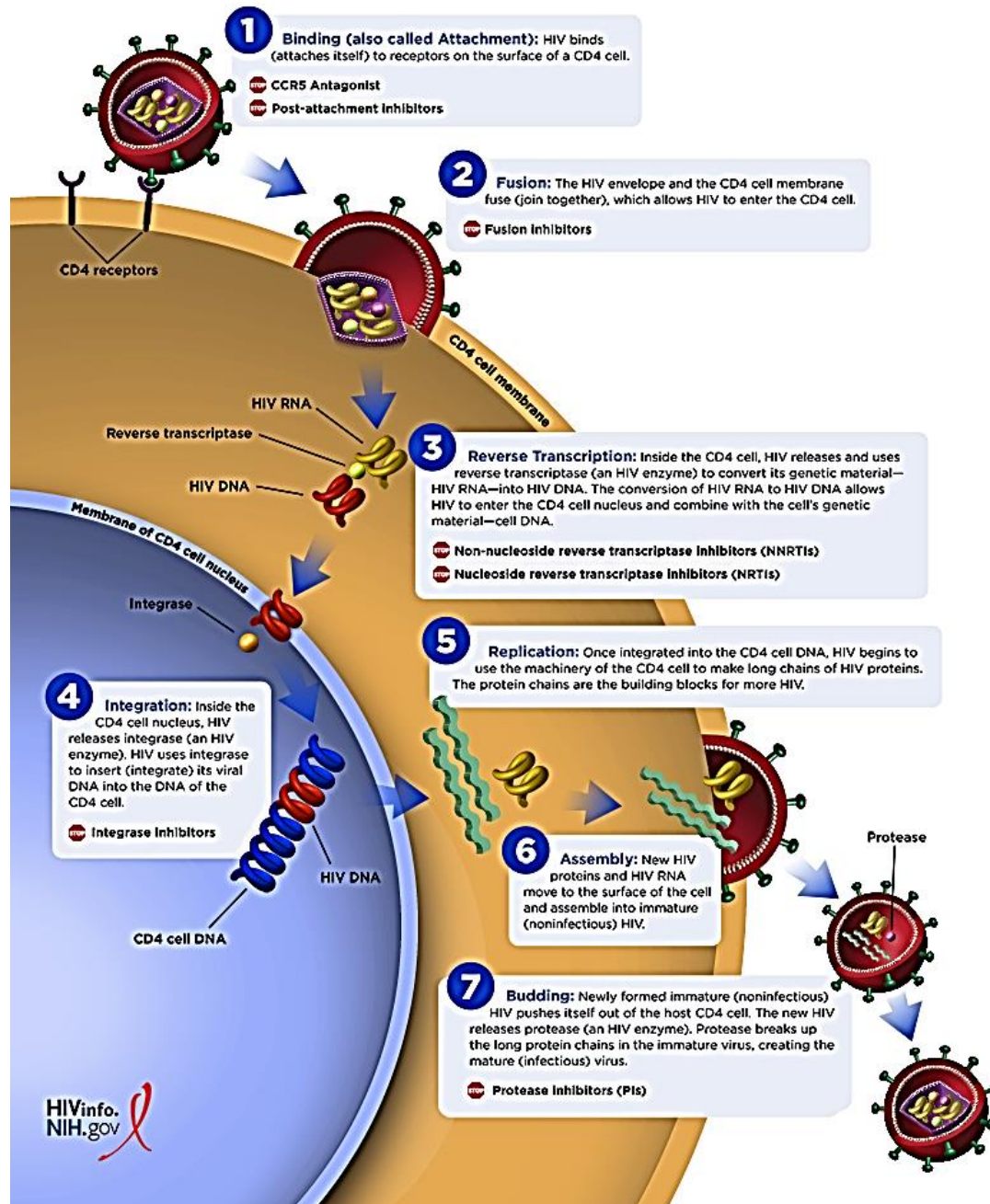
The seven stages of the HIV life cycle are:

- 1) Binding
- 2) Fusion
- 3) Reverse transcription
- 4) Integration
- 5) Replication
- 6) Assembly
- 7) Budding.

To understand each stage in the HIV life cycle, it helps to first imagine what HIV looks like.

The HIV Life Cycle

HIV medicines in seven drug classes stop (🛑) HIV at different stages in the HIV life cycle.



Pathogenesis

HIV infects the body, has a long incubation period (clinical latency), and ultimately causes the signs and symptoms of disease, here AIDS. HIV causes severe damage to the immune

system and eventually destroys it by using the DNA of CD4+ cells to replicate itself. In that process, the virus eventually destroys the CD4+ cells.

Treatment

Antiretroviral therapy is the use of a combination of HIV medicines to treat HIV infection. People take a combination of HIV medicines (called an HIV treatment regimen) every day. HIV medicines protect the immune system by blocking HIV at different stages of the HIV life cycle. HIV medicines are grouped into different drug classes according to how they fight HIV. Each class of drugs is designed to target a specific step in the HIV life cycle.

Because an HIV treatment regimen includes HIV medicines from at least two different HIV drug classes, antiretroviral therapy is very effective at preventing HIV from multiplying. Having less HIV in the body protects the immune system and prevents HIV from advancing to acquired immunodeficiency syndrome (AIDS) .

Antiretroviral therapy cannot cure HIV, but HIV medicines help people with HIV live longer, healthier lives. HIV medicines also reduce the risk of HIV transmission (the spread of HIV to others).