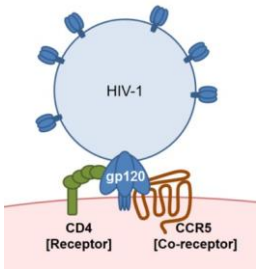
NAME: Tipsiri Sahaworapan

Immunity Disorders (HIV infection/AIDS)

1. Explain the process of HIV replication cycle.



1

Fusion of HIV to host cell surface

***gp120** changing the shape attach to CD4 receptor and ccR5 co-receptor: explosure of a portion's transmembrane glycoprotien

***gp 41** bring HIV rival move closer to host cell: the fusion of viral envelopment together

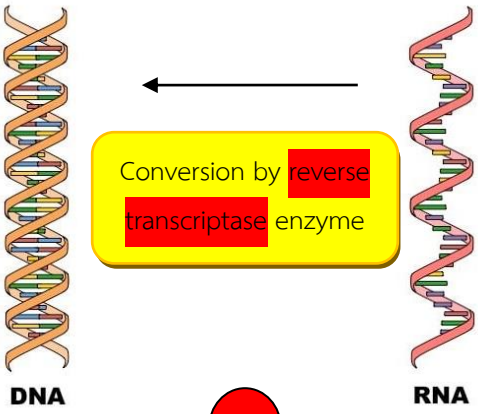
*disintegrate matrix and release of the capsid inside cytoplasm

2

capsid including: HIV RNA, Reverse transcriptase, intregrase, and others viral protein

*exposure of naked strand of viral RNA

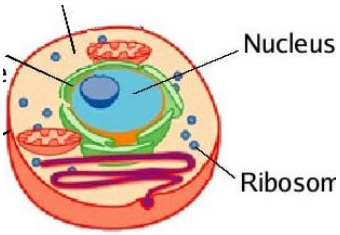
Conversion by reverse transcriptase enzyme



3

Viral DNA is formed by reverse transcription

*double HIV DNA migrate to nucleus of the host cell



*intregrase slice through the DNA of the host cell permitting the viral DNA to be inserted at a variety of sites in the viral DNA of the host cell

Systhesis of viral protien

Viral RNA

Viral messager RNA

4

Viral DNA is transport across the nucleus and intregrate into host DNA

*Back to cytoplasm

*ribosome make viral RNA and messager RNA to consequence to juxtaposition

Long precursor protein: inactive

Protease cut long precursor protein

5

New viral RNA is used as genomic RNA and to make viral protien

*Virus particle(small polypedtide): Active

6

New viral RNA and protien move to the cell surface and immature HIV form

7

Viral is released Viral protease cleaves new polyprotien to create mature infection virus

[พิมพ์ที่นี่]

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2. Classify CDC stages and symptoms of HIV infection/AIDS.

Stage 1: Acute HIV Infection

- People have a large amount of HIV in their blood.
- Some people have flu-like symptoms.
- If you have flu-like symptoms and think you may have been exposed to HIV, seek medical care and ask for a test to diagnose acute infection: Western blot test, ELISA testing, PCR testing.

Stage 2: Clinical latency

- This stage is also called asymptomatic HIV infection or chronic HIV infection.
- HIV is still active but reproduces at very low levels.
- People may not have any symptoms or get sick during this phase.
- At the end of this phase, the amount of HIV in the blood (called *viral load*) goes up and the CD4 cell count goes down. The person may have symptoms as the virus levels increase in the body, and the person moves into Stage 3.
- People who take HIV medicine as prescribed may never move into Stage 3.

Stage 3: AIDs

- The most severe phase of HIV infection.
- People with AIDS have such badly damaged immune systems
- People receive an AIDS diagnosis when their CD4 cell count drops below 200 cells/mm, or if they develop certain opportunistic infections.
- People with AIDS can have a high viral load and be very infectious.

symptoms of HIV infection/AIDS

Some people have flu-like symptoms within 2 to 4 weeks after infection. These symptoms may last for a few days or several weeks. Possible symptoms include Fever, Chills,Rash, Night sweats, Muscle aches, Sore throat, Fatigue, Swollen lymph nodes, and Mouth ulcers.

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3. Written how antiviral drug (Stavudine, Lopinavir and Efavirenz) inhibit the HIV-RNA and specific the most common adverse effects.

Answer -Stavudine(d4T) in NRTIs(Nucleoside reverse transcriptase inhibitors): Block reverse transcriptase before HIV genetic code combines with infected cell's genetic code.
The most common adverse effects are Hepatotoxicity, Lactic acidosis/hepatic steatosis, Lipoatrophy, Hyperglycemia, Myelosuppression, bone marrow toxicity, Nervous system

-Lopinavir(LPV) in Pls(Protease inhibitors): Block protease enzyme that breaks up long polyprotein strands into small functional proteins required for assembly of new viral particles.
The most common adverse effects are Lipohypertrophy, Hepatotoxicity, Cardiovascular, Cerebovascular disease, Gastrointestinal absorption, Renal effects

-Efavirenz(EFV) in NNRTIs(Nonnucleoside reverse transcriptase inhibitors): Block reverse transcriptase and reverse transcription prevents HIV from replicating.

The most common adverse effects are Neuropsychiatric, Hepatotoxicity, Dyslipidemia, Rash

4. Explain: What are the goals of HAART and how to make it achievable?

Answer What are the goals of HAART:

- Improvement of the patient's quality of life.
- Reduction of HIV related morbidity and mortality
- Restoration and/or preservation of immunologic function
- Maximal and durable suppression of the viral replication

Tools to achieve the goal of therapy:

1. Patient education to ensure long term adherence to treatment

a. Why lifelong continuous treatment is essential and expected benefits of treatment

b. The use of ARVs at the right frequency of dosing Check the number of pills(correct dose) The time patient were taking them ability to keep to this pattern of utilization is defined as 100% adherence, while adherence of>95% is accepted as optimal adherence, drug resistance

c. Potential side effects of treatment and how to do when side effects happen

d. Necessity for follow up

e. Need to avoid recreation and non prescribed drug including herbal medication whose interactions with ARV drugs are undefined or undesirable

2. Provider education and experience:

a. Assess and prepare patients to ensure long term adherence to treatment

b. Use drugs rationally allowing for future treatment options

c. Ensure regular and adequate monitoring of patients

d. Manage complication of treatment and be able to change or discontinue treatment appropriately

5. What are outcome indicators for successful HAART?

Surrogate marker response:

-Viral load < 50 copies/ml by 16-24 weeks

-CD4 increase 100-150 cells/mm^3 per year

Clinical assessment:

-No opportunistic infections(CD4 counts fall toward 200 cells/μl for ≥ 3 month

-Minimal side effect of ARV drug

-Well-being

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