

Acquired Immune Deficiency Syndrome (AIDS)

Case Study

HIV/AIDS

HIV requires CD4 and an obligatory chemokine co-receptor (CXCR4 and CCR5) to infect cells.

Drop of CD4+ count below 350 cells/ μ l constitutes the beginning of the symptomatic phase.

HIV Infecting Th Cells

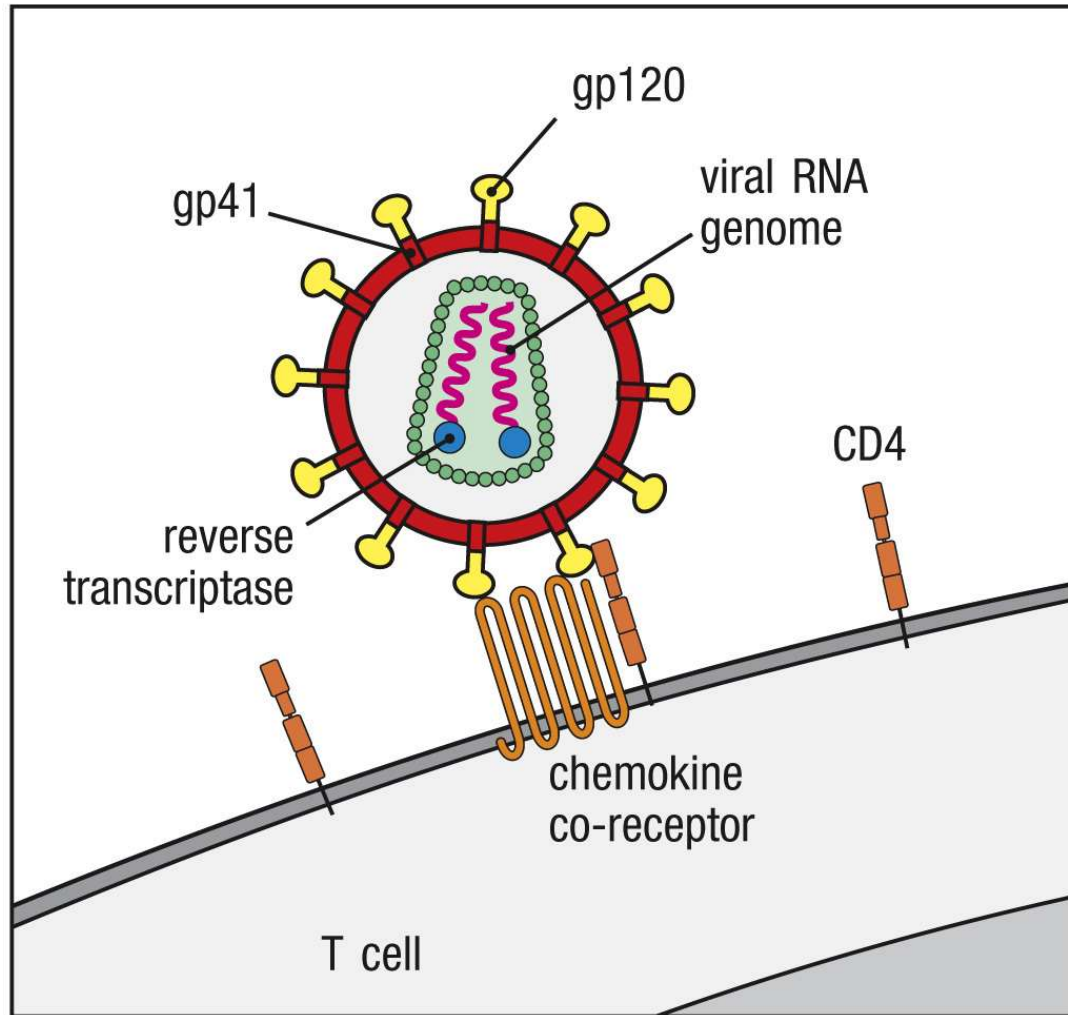


Figure 10.1 Case Studies in Immunology, 7th ed. (© Garland Science 2016)

Case of Martin Thomas

42-year old police officer

6 months ago, went to ER complaining of a fever and swollen hand.

Very low lymphocyte count, sent to HIV testing.

History of unprotected sexual encounters with both sexes before his marriage.

6 months ago, night sweats several times a week, and weight loss.

Given prophylactic therapy against *Pneumocystis jirovecii*

Combination of antiretroviral agents: Tenofovir, emtricitabine, efavirenz.

Wife, kid, and fetus were HIV negative.

Cells that can be infected: Macrophages (Glial cells, dementia and more), DCs, Th cells, CD4+ megakaryocytes= thrombocytopenia and bleeding)

HIV Testing algorithm

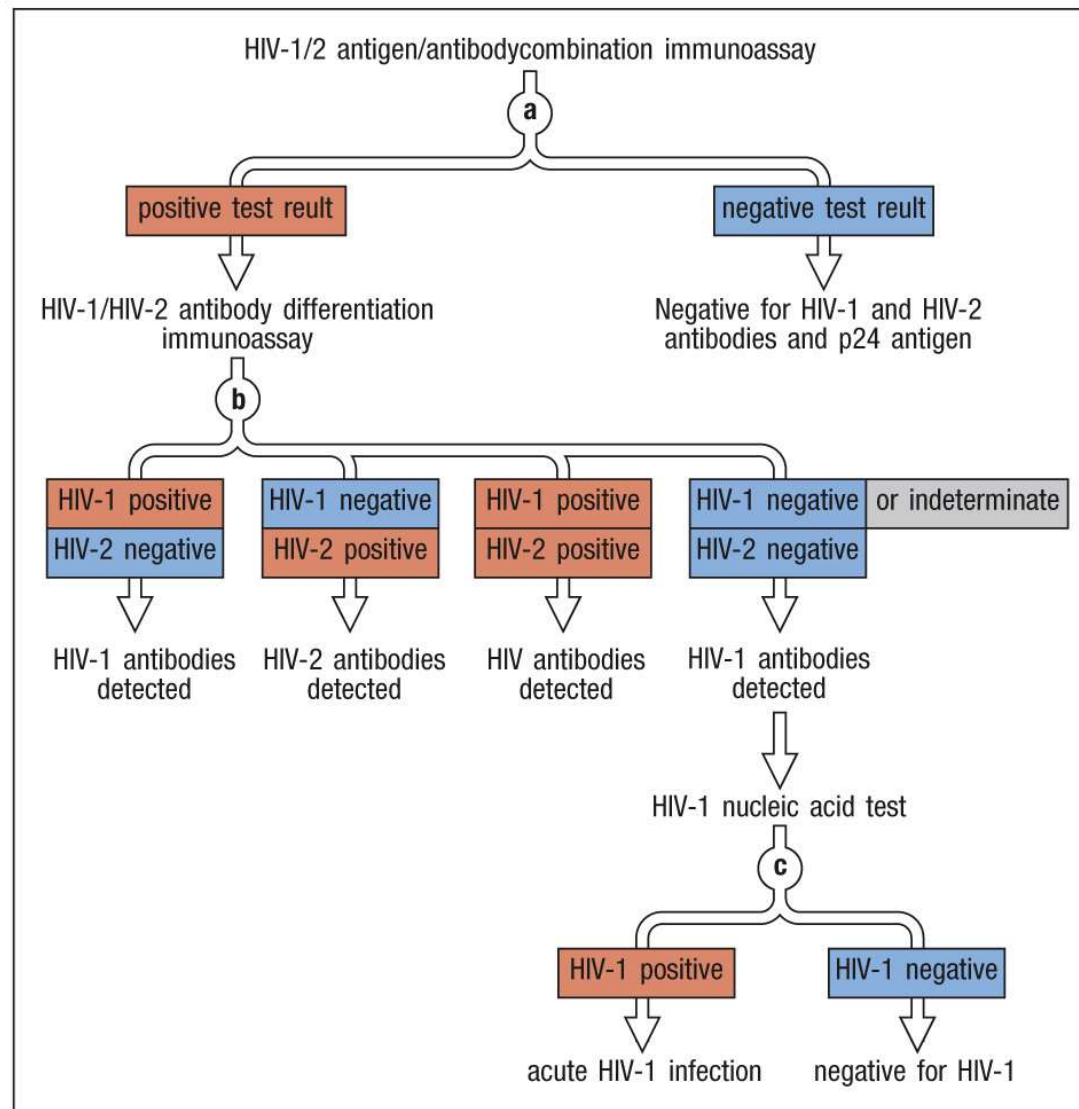
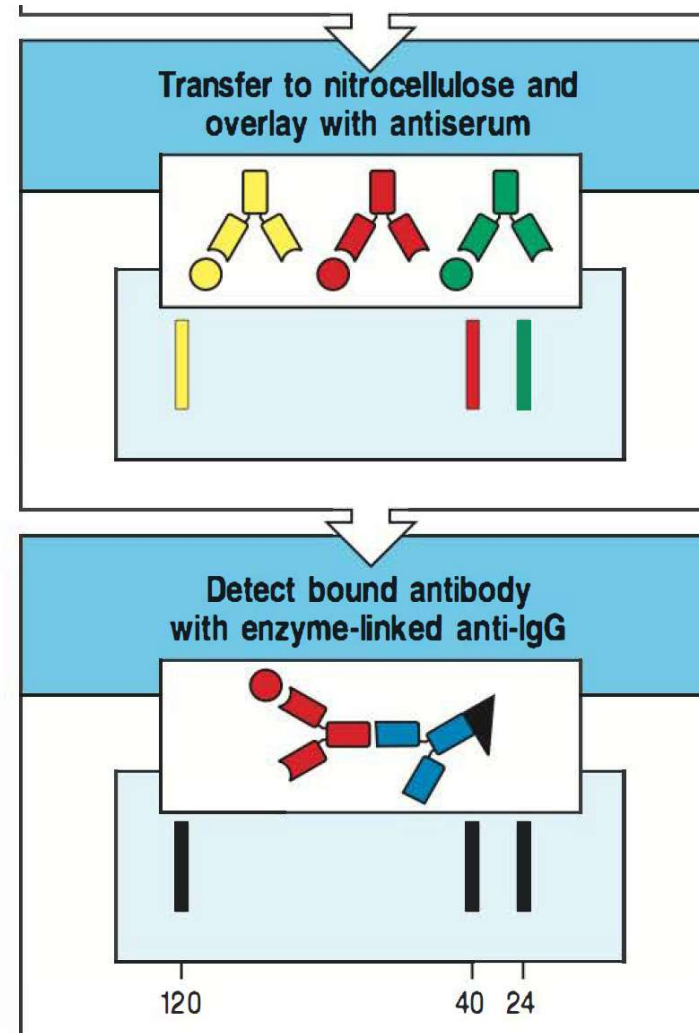
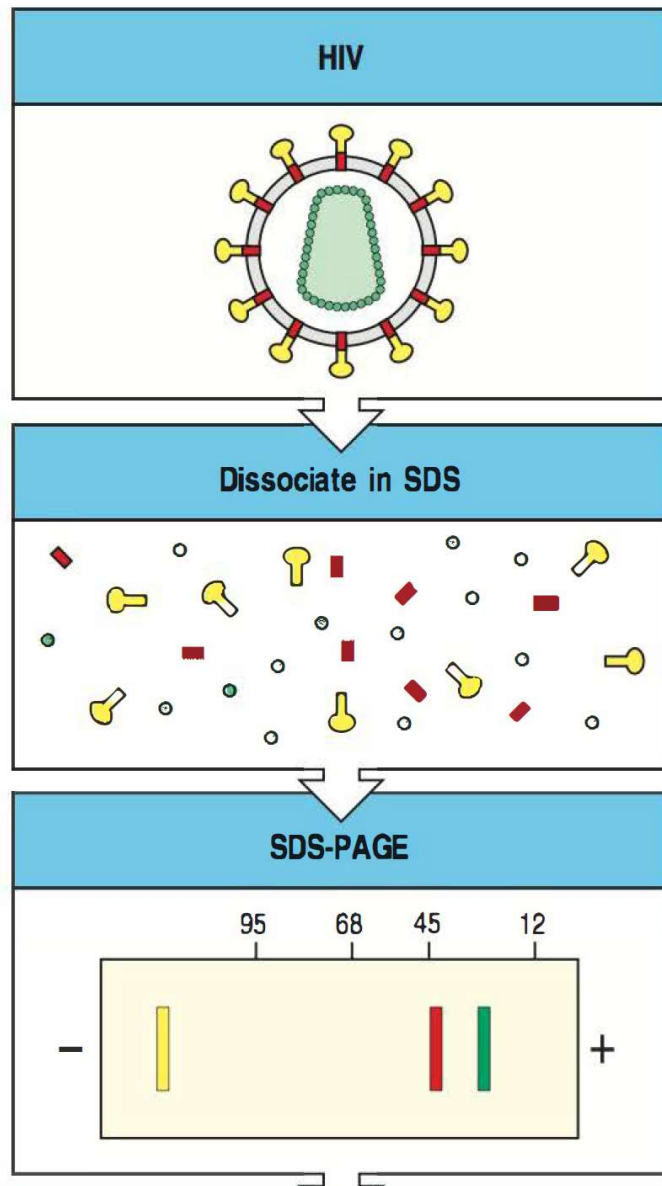


Figure 10.2 Case Studies in Immunology, 7th ed. (© Garland Science 2016)

Confirmation by Western Blot



Typical Course of HIV Infection

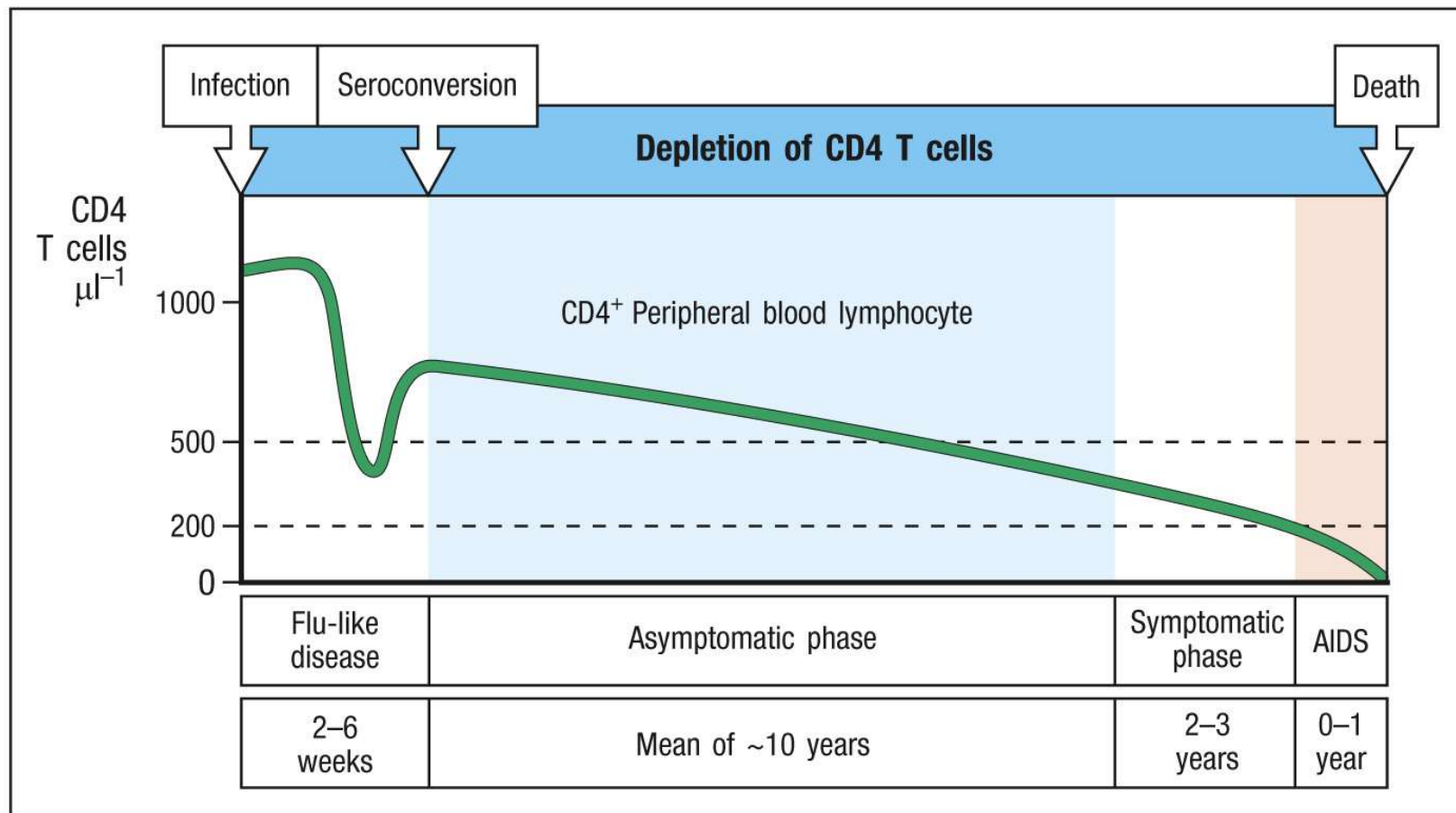


Figure 10.4 Case Studies in Immunology, 7th ed. (© Garland Science 2016)

Opportunistic Infections and malignancies associated with HIV

Infections	
Parasites	<i>Toxoplasma</i> spp. <i>Cryptosporidium</i> spp. <i>Leishmania</i> spp. <i>Microsporidium</i> spp.
Bacteria	<i>Mycobacterium tuberculosis</i> <i>Mycobacterium avium</i> <i>intracellulare</i> <i>Salmonella</i> spp.
Fungi	<i>Pneumocystis jirovecii</i> <i>Cryptococcus neoformans</i> <i>Candida</i> spp. <i>Histoplasma capsulatum</i> <i>Coccidioides immitis</i>
Viruses	Herpes simplex Cytomegalovirus Herpes zoster
Malignancies	
Kaposi's sarcoma (invasive) Non-Hodgkin's lymphoma, including EBV-positive Burkitt's lymphoma Primary lymphoma of the brain	

Figure 10.5 Case Studies in Immunology, 7th ed. (© Garland Science 2016)

What are the major differences between pediatric and adult AIDS?

Infants have a more rapid infection course, die before 1 year old.

Infants are prone to infections not seen in adults: Pyogenic infections, EBV, etc

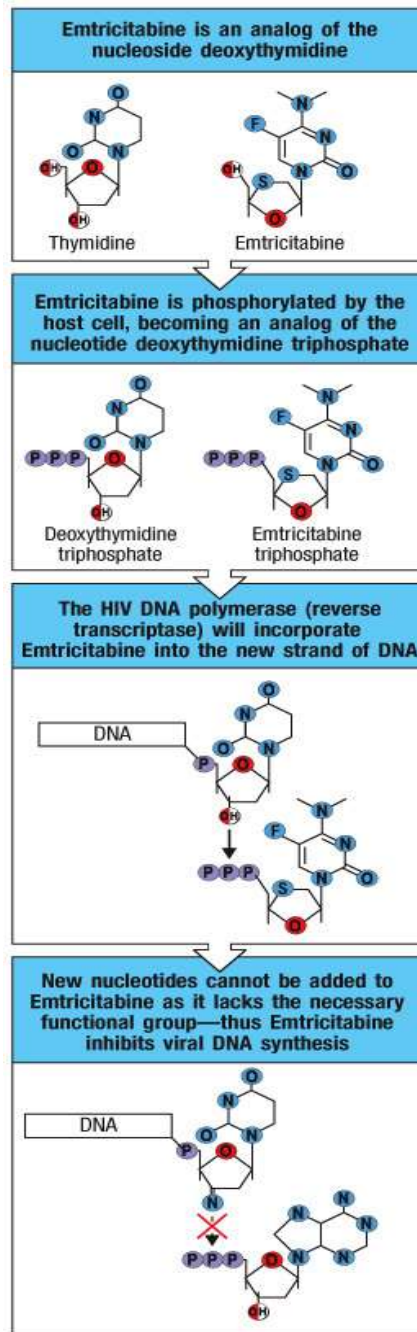
Do antibodies resist the progression of HIV infection?

Neither env or p24 antibodies resist progression. More a CD8+-mediated effect.

How do tenofovir, emtricitabine, and efavirenz work?

Tenofovir and emtricitabine are NRTIs and block virus RT.

Efavirenz is an NNRTI. (Can also add protease and integrase inhibitors)



Mechanism of action of Emtricitabine

Figure A10.5 Case Studies in Immunology, 7th ed. (© Garland Science 2016)

What do protease and integrase inhibitors do? Does Mr. Thomas need them?

Inhibit HIV protease and integrase.

Protease splices HIV gag proteins before packaging and budding, Integrase inhibits viral DNA integration step.

What is the most important determinant in the progression of HIV?

CD4 T cell count.

What causes weight loss in HIV patients?

TNF- α , causing anorexia and increased body heat expenditure