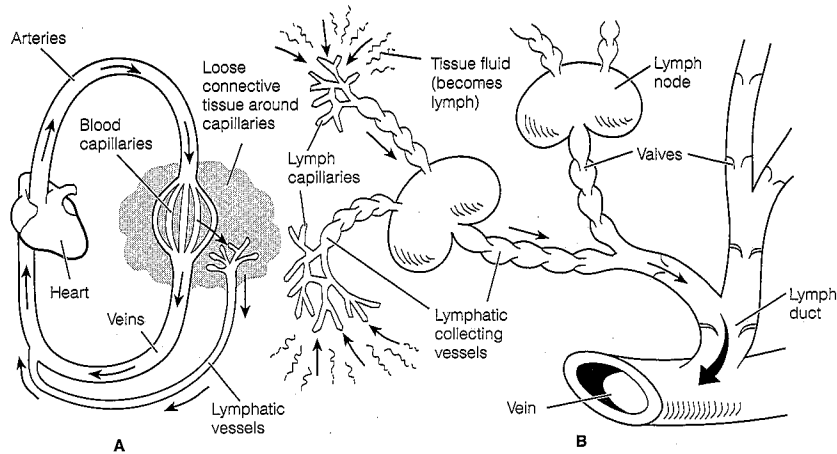


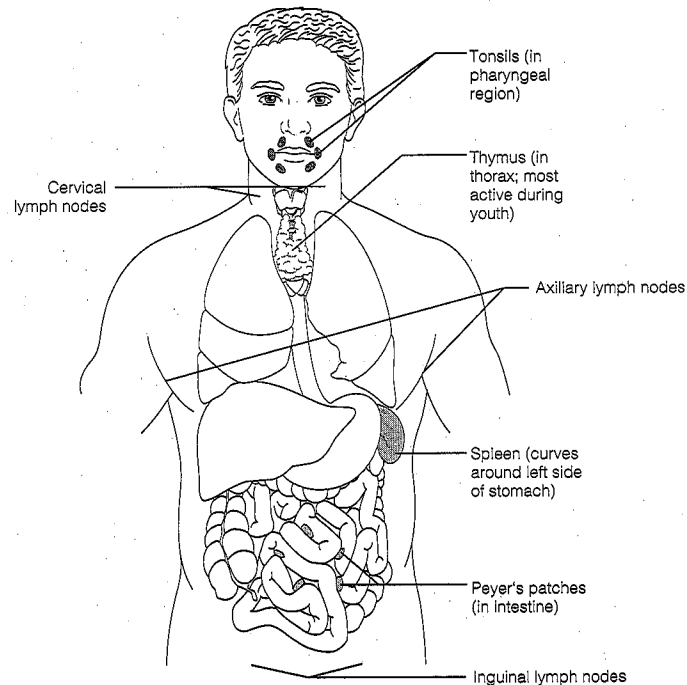
Chapter 12 The Lymphatic System and Body Defenses

The Lymphatic System

1. Pump. 2. Arteries. 3. Veins. 4. Valves. 5. Lymph. 6. 3 liters.
- Figure 12-1:**

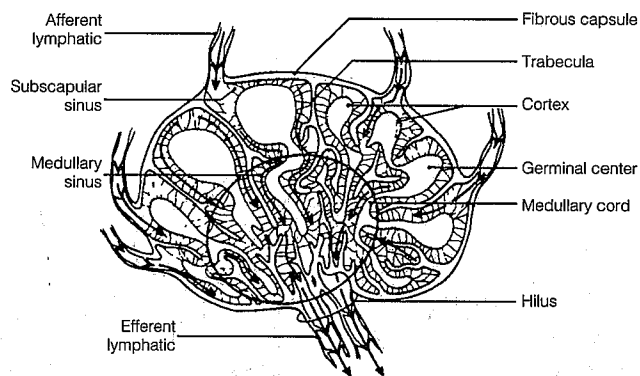


1. Blood capillary. 2. Abundant supply of lymphatics. 3. High-pressure gradient. 4. Impermeable.
1. C or spleen. 2. A or lymph nodes. 3. D or thymus. 4. B or Peyer's patches, E or tonsils. 5. C or spleen. 6. B or Peyer's patches.
- Figure 12-2:** Shade in the right upper limb and right side of the thorax and head.



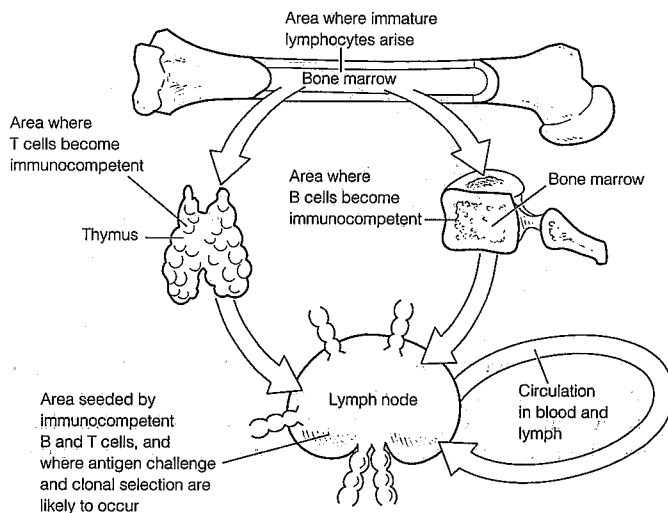
1. B lymphocytes. 2. They produce and release antibodies. 3. T lymphocytes. 4. Macrophages; Phagocytes.
5. This slows the flow of lymph through the node, allowing time for immune cells and macrophages to respond to foreign substances present in the lymph. 6. Valves in the afferent and efferent lymphatics. 7. Cervical, axillary, inguinal. 8. They act to protect the body by removing bacteria or other debris from the lymphatic stream.

Figure 12-3:



Body Defenses

7. 1. Surface membrane barriers, mucosae. 2. Natural killer cells. 3. Chemicals (inflammatory and antimicrobial).
8. 1. Tears and saliva. 2. Stomach and female reproductive tract. 3. Sebaceous (oil) glands; skin. 4. Digestive.
9. 1. Itching. 2. Natural killer cells. 3. Interferon. 4. Inflammation. 5. Antibacterial.
10. 1. B or lysozyme, F or sebum. 2. C or mucosae, G or skin. 3. A or acids, B or lysozyme, D or mucus, E or protein-digesting enzymes, F or sebum. 4. D or mucus. 5. A-G.
11. They propel mucus laden with trapped debris superiorly away from the lungs to the throat, where it can be swallowed or spat out.
12. Phagocytosis is ingestion and destruction of particulate material by certain cells. The rougher the particle, the more easily it is ingested.
13. Check 1, 3, 4.
14. 1. Prevents the spread of damaging agents to nearby areas. 2. Disposes of cell debris and pathogens. 3. Sets the stage for repair (healing).
15. 1. F or increased blood flow. 2. E or histamine. 3. G or inflammatory chemicals. 4. A or chemotaxis. 5. C or edema. 6. H or macrophages. 7. B or diapedesis. 8. I or neutrophils. 9. D or fibrin mesh.
16. 1. Proteins. 2. Activated. 3. Holes or lesions. 4. Water. 5. Lysis. 6. Opsonization.
17. Interferon is synthesized in response to viral infection of a cell. The cell produces and releases interferon proteins, which diffuse to nearby cells, where they prevent viruses from multiplying within those cells.
18. 1. Immune system. 2. Proteins. 3. Haptens. 4. Nonself.
19. 1. A or antigens. 2. E or humoral immunity. 3. D or cellular immunity. 4 and 5. B or B cells and I or T cells. 6. H or macrophages. 7 and 8. C or blood and F or lymph. 9. G or lymph nodes.
20. **Figure 12-4:**



1. The appearance of antigen-specific receptors on the membrane of the lymphocyte. 2. Fetal life. 3. Its genes.
4. Binding to "its" antigen. 5. "Self."

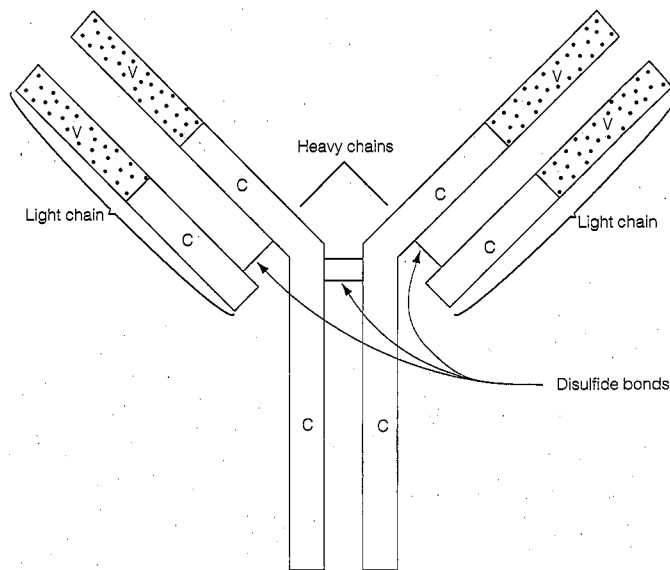
21. Characteristic

	T cell	B cell
Originates in bone marrow from stem cells called hemocytoblasts	✓	✓
Progeny are plasma cells		✓
Progeny include suppressors, helpers, and killers	✓	
Progeny include memory cells	✓	✓
Is responsible for directly attacking foreign cells or virus-infected cells	✓	
Produces antibodies that are released to body fluids		✓
Bears a cell-surface receptor capable of recognizing a specific antigen	✓	✓
Forms clones upon stimulation	✓	✓
Accounts for most of the lymphocytes in the circulation	✓	

22. 1. Lymphokines. 2. Hapten. 3. Liver.

23. Figure 12-5:

1. The V portion. 2. The C portion.



24. 1. B or IgD. 2. D or IgG. 3. E or IgM. 4. D or IgG, E or IgM. 5. E or IgM. 6. D or IgG.
7. C or IgE. 8. A or IgA.

25. 1. Antigen. 2. Complement activation and lysis. 3. Neutralization. 4. Agglutination. 5. IgM.
6. Precipitation. 7. Phagocytes.

26. 1. A. 2-4. P. 5. A. 6. A.

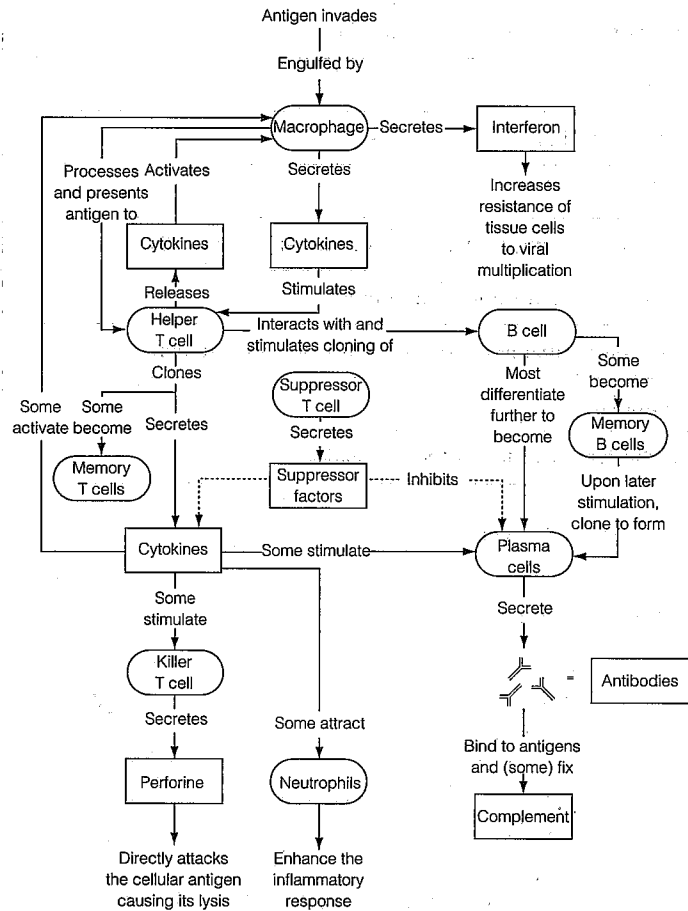
27. 1. P. 2. P. 3. S. 4. P. 5. S.

28. 1. A or helper T cell. 2. A or helper T cell. 3. C or suppressor T cell. 4. B or killer T cell.

29. 1. G or interferon. 2. C or chemotaxis factors. 3. B or antibodies. 4. F or inflammation.
5. E or cytokines. 6. D or complement. 7. E or cytokines.

30. 1. Allografts; an unrelated person. 2. Cytotoxic (killer) T cells and macrophages. 3. To prevent rejection, the recipient's immune system must be suppressed. The patient is unprotected from foreign antigens, and bacterial or viral infection is a common cause of death.

31. Figure 12-6:



32. 1. C or immunodeficiency. 2. A or allergy. 3. A or allergy. 4. C or immunodeficiency. 5. B or autoimmune disease. 6. C or immunodeficiency. 7. B or autoimmune disease. 8. A or allergy. 9. A or allergy.

Developmental Aspects of the Lymphatic System and Body Defenses

33. 1. Veins. 2. Thymus. 3. Spleen. 4. Thymosin. 5. Liver. 6. Lymphatic organs. 7. Birth (or shortly thereafter). 8. Declines. 9-11. (in any order): Immunodeficiencies; Autoimmune diseases; Cancer. 12. IgA.

The Incredible Journey

34. 1. Protein. 2. Lymph node. 3. B lymphocytes (B cells). 4. Plasma cell. 5. Antibodies. 6. Macrophage. 7. Antigens. 8. Antigen presenters. 9. T. 10. Clone. 11. Immunologic memory.

At the Clinic

35. Anaphylactic shock (histamine caused bodywide loss of fluid from the bloodstream); epinephrine injections.
 36. Contact dermatitis (delayed hypersensitivity) probably caused by a reaction to the chemicals in the detergent used to launder the diapers.
 37. James is suffering from AIDS. To date, it is nearly 100% fatal.
 38. She has the classic signs of hypothyroidism (probably due to neck trauma) and she appears to be exhibiting an autoimmune reaction to formerly "hidden antigens" in the thyroid gland colloid.
 39. Hemorrhage; the spleen is a blood reservoir. No; the liver, bone marrow, and other tissues can take over the spleen's functions.
 40. The acidity of the vaginal tract inhibits bacterial growth. Hence, anything that decreases vaginal acidity provides an opportunity for bacterial proliferation and vaginal inflammation.
 41. Lymphedema or swelling due to an accumulation of tissue fluid (lymph) in the area. No, the lymphatic vessels will eventually be replaced by budding from the veins in the area.