

Nonspecific Defenses Against Infection

1. Explain what is meant by nonspecific defense and list the nonspecific lines of defense in the vertebrate body.
2. Distinguish between:
 - a. innate and acquired immunity
 - b. humoral and cell mediated response
3. Explain how the physical barrier of skin is reinforced by chemical defenses.
4. Define phagocytosis. Name four types of phagocytic leukocytes.
5. Explain how interferon limits cell-to-cell spread of viruses.
6. Describe the inflammation response, including how it is triggered.
7. Describe the factors that influence phagocytosis during the inflammation response.
8. Explain how the action of natural killer cells differs from the action of phagocytes.
9. Explain what occurs during the condition known as septic shock.
10. Describe the roles of antimicrobial proteins in innate immunity.

How Specific Immunity Arises

11. Distinguish between antigens and antibodies.
12. Distinguish between antigen and epitope.
13. Explain how B lymphocytes and T lymphocytes recognize specific antigens
14. Explain how the particular structure of a lymphocyte's antigen binding site forms during development. Explain the role of recombinase in generating the staggering variability of lymphocytes.
15. Explain why the antigen receptors of lymphocytes are tested for self-reactivity during development. Predict the consequences that would occur if such testing did not take place.
16. Describe the mechanism of clonal selection. Distinguish between effector cells and memory cells.
17. Distinguish between primary and secondary immune responses.
18. Describe the cellular basis for immunological memory.
19. Describe the variation found in the major histocompatibility complex (MHC) and its role in the rejection of tissue transplants. Explain the adaptive advantage of this variation.
20. Compare the structures and functions of cytotoxic T cells and helper T cells.
21. Compare the production and functions of class I MHC and class II MHC molecules.

Immune Responses

22. Distinguish between humoral immunity and cell-mediated immunity.
23. Describe the roles of helper T lymphocytes in both humoral and cell-mediated immunity.
24. Describe the functions of the proteins CD4 and CD8.
25. Explain how cytotoxic T cells and natural killer cells defend against tumors.
26. Distinguish between T-dependent antigens and T-independent antigens.
27. Explain why macrophages are regarded as the main antigen-presenting cells in the primary response but memory B cells are the main antigen-presenting cells in the secondary response.
28. Explain how antibodies interact with antigens.
29. Diagram and label the structure of an antibody and explain how this structure allows antibodies to (a) recognize and bind to antigens, and (b) assist in the destruction and elimination of antigens.
30. Distinguish between the variable (V) and constant (C) regions of an antibody molecule.
31. Describe the production and uses of monoclonal antibodies.
32. Compare the processes of neutralization, opsonization, and agglutination.

Immunity in Health and Disease

33. Distinguish between active and passive immunity and describe examples of each.
34. Explain how the immune response to Rh factor differs from the response to A and B blood antigens.
35. Describe the potential problem of Rh incompatibility between a mother and her unborn fetus and explain what precautionary measures may be taken.
36. Explain what is done medically to reduce the risk of tissue transplant rejection due to differences in the MHC. Explain what is unique about the source of potential immune rejection in bone marrow grafts.
37. Describe an allergic reaction, including the roles of IgE, mast cells, and histamine.
38. Explain what causes anaphylactic shock and how it can be treated.
39. List three autoimmune disorders and describe possible mechanisms of autoimmunity.
40. Distinguish between inborn and acquired immunodeficiency.
41. Explain how general health and mental well-being might affect the immune system.
42. Describe the infectious agent that causes AIDS and explain how it enters a susceptible cell.
43. Explain how HIV is transmitted and describe its incidence throughout the world. Note strategies that can reduce a person's risk of infection.