

## **Chapter 1. Introduction to Immunity and the Immune System**

### Multiple Choice

1. Eosinophils are involved in the immune response against:

- A. viruses.
- B. intracellular bacteria.
- C. parasites that cannot be phagocytized.
- D. extracellular bacteria.

ANS: C

2. Which of the following are components of both innate and adaptive immune responses?

- A. Immunoglobulins
- B. T helper cells
- C. Macrophages
- D. B cells

ANS: C

3. The process by which leukocytes are attracted to a specific area by chemical messengers is called:

- A. diapedesis.
- B. degranulation.
- C. chemotaxis.
- D. opsonization.

ANS: C

4. Which of the following is a characteristic of natural killer cells?

- A. They mature in the thymus.
- B. They are smaller than B and T cells.
- C. They are a type of lymphocyte.
- D. They are part of the adaptive immune system.

ANS: C

5. Which of the following best describes diapedesis?

- A. Movement toward increasing concentrations of a cytokine
- B. Attachment of immunoglobulin to target cells

- C. Movement through blood vessel walls as cells exit the circulation
- D. Engulfment of target cells

ANS: C

6. The most effective phagocytic and antigen-presenting cell is the:
- A. neutrophil.
  - B. monocyte.
  - C. dendritic cell.
  - D. macrophage.

ANS: C

7. Which of the following is characteristic of natural immunity?
- A. It involves memory.
  - B. T lymphocytes play a major role.
  - C. It involves specificity.
  - D. Mechanisms are always present and fully functional.

ANS: D

8. All of the following cells are considered part of natural immunity EXCEPT:
- A. eosinophils.
  - B. B lymphocytes.
  - C. monocytes.
  - D. neutrophils.

ANS: B

9. Where does the specific immune response to a foreign antigen mainly occur?
- A. Lymph nodes
  - B. Blood
  - C. Bone marrow
  - D. Skin

ANS: A

10. Which white cell in the peripheral blood migrates into tissue to become a macrophage?
- A. Eosinophil
  - B. Basophil
  - C. Neutrophil

D. Monocyte

ANS: D

11. A white blood cell that is 16 to 18 micrometers in diameter, has a horseshoe-shaped nucleus, and is capable of phagocytosis is a:

- A. neutrophil.
- B. eosinophil.
- C. basophil.
- D. monocyte.

ANS: D

12. Pasteur's discovery that older bacterial cultures would not cause disease in chickens but would protect them from subsequent infection with more virulent strains is an example of:

- A. attenuated vaccine.
- B. natural immunity.
- C. passive immunity.
- D. cross-immunity.

ANS: A

13. Antibodies are secreted by:

- A. plasma cells.
- B. B cells.
- C. T cells.
- D. dendritic cells.

ANS: A

14. Which of the following is characteristic of mucosal-associated lymphoid tissue?

- A. It is one of the primary lymphoid organs.
- B. It clears pathogens from the bloodstream.
- C. It includes the tonsils and the appendix.
- D. It includes the liver and spleen.

ANS: C

15. Acquired (adaptive) immunity can be characterized as:

- A. nonspecifically activated.
- B. immediately responsive.

- C. neutrophil dependent.
- D. involving memory.

ANS: D

16. Which of the following is NOT a characteristic of neutrophils?
- A. Congregate in the marginating pool in blood vessels
  - B. Capable of diapedesis
  - C. Granules that become bright orange with Wright stain
  - D. Segmented nucleus

ANS: C

17. The function of NK cells is to:
- A. produce antibody.
  - B. phagocytize bacteria.
  - C. present antigen to T cells.
  - D. kill target cells such as tumor and virally infected cells.

ANS: D

18. All of the following are involved in adaptive immunity EXCEPT:
- A. memory.
  - B. lymphocytes.
  - C. specificity.
  - D. neutrophils.

ANS: D

19. Which of the following is NOT a characteristic of a lymph node?
- A. Filters interstitial fluid draining from tissues
  - B. Colonized with T and B cells
  - C. Between 1 and 25 mm in size
  - D. Considered a primary or central lymphoid organ

ANS: D

20. All of the following are considered part of natural immunity EXCEPT:
- A. eosinophils.
  - B. lymphocytes.
  - C. acute-phase reactants.

D. neutrophils.

ANS: B

21. Macrophages that migrate to the liver are called:

- A. alveolar macrophages.
- B. histiocytes.
- C. microglial cells.
- D. Kupffer cells.

ANS: D

22. Innate immunity can be characterized as:

- A. specific.
- B. slow to respond.
- C. dependent upon neutrophils and macrophages.
- D. involving memory.

ANS: C

23. The ability to resist infection through normally present body functions best characterizes:

- A. autoimmunity.
- B. natural immunity.
- C. acquired immunity.
- D. alloimmunity.

ANS: B

24. Which type of cell has a diameter between 10 and 15 micrometers, has a multi-lobed nucleus, and usually comprises more than 50% of circulating leukocytes?

- A. Neutrophil
- B. Lymphocyte
- C. Basophil
- D. Monocyte

ANS: A

25. Which of the following is NOT a component or characteristic of natural (innate) immunity?

- A. Repeated exposure to a pathogen does not change the response.
- B. The response involves acute-phase reactants.
- C. The response involves phagocytosis.

D. The response involves antibodies.

ANS: D

26. T cells are mainly concentrated in which region of the lymph nodes?

- A. Primary follicles
- B. Secondary follicles
- C. Paracortex
- D. Medulla

ANS: C

27. A primary site of antigen trapping and presentation to immune cells is the:

- A. spleen.
- B. thymus.
- C. bone marrow.
- D. brain.

ANS: A

28. Hematopoietic stem cells are located in the:

- A. lymph nodes.
- B. spleen.
- C. bone marrow.
- D. thymus.

ANS: C

29. Which of the following is NOT a characteristic or function of the spleen?

- A. Removes old red blood cells from the circulation
- B. Filters infectious agents and foreign matter from the blood
- C. Less than 25 mm in size
- D. Is considered a secondary lymphoid organ

ANS: C

30. T cells mature in the:

- A. bone marrow.
- B. thymus.
- C. lymph nodes.
- D. spleen.

ANS: B

31. Primary lymphoid organs include which of the following?

- A. Spleen
- B. Tonsils
- C. Thymus
- D. Lymph nodes

ANS: C

32. B cells that are actively responding to antigen can be found in the:

- A. peripheral blood.
- B. primary follicles.
- C. germinal centers.
- D. bone marrow.

ANS: C

33. Contact with antigen and activation of B cells normally occurs in the:

- A. peripheral blood.
- B. connective tissue.
- C. thymus.
- D. lymph nodes.

ANS: D

34. Which best describes lymph nodes?

- A. They line the interior of small blood vessels.
- B. They are concentrated where appendages join the thorax of the body.
- C. They are approximately 12 cm in size.
- D. They are considered primary or central lymphoid organs.

ANS: B

35. Which of the following is a characteristic of opsonins?

- A. They are carbohydrates that stimulate T cells.
- B. They are molecules that coat bacteria, making them more susceptible to phagocytosis.
- C. They are expressed on the surface of neutrophils.
- D. They are produced by NK cells.

ANS: B

36. "Cluster of differentiation" refers to:

- A. a category of cell surface proteins used to identify cell types.
- B. aggregates of differentiating stem cells.
- C. groups of antigens that identify a cell as foreign.
- D. the cells that congregate in germinal centers.

ANS: A

37. All of the following are commonly found within non-lymphoid tissues EXCEPT:

- A. B cells.
- B. macrophages.
- C. mast cells.
- D. dendritic cells.

ANS: A

Matching

*Match each scientist with the appropriate immunological discovery.*

- A. Elie Metchnikoff
- B. Edward Jenner
- C. Emil Von Behring
- D. Almoth Wright

- 38. Vaccination
- 39. Opsonization
- 40. Humoral immunity
- 41. Phagocytosis

- 38. B
- 39. D
- 40. C
- 41. A