



## Chapter 37 Exercises

### Review Questions

- Which of the following is a barrier against pathogens provided by the skin?
  - high pH
  - mucus
  - tears
  - desiccation
- Although interferons have several effects, they are particularly useful against infections with which type of pathogen?
  - bacteria
  - viruses
  - fungi
  - helminths
- Which organelle do phagocytes use to digest engulfed particles?
  - lysosome
  - nucleus
  - endoplasmic reticulum
  - mitochondria
- Which innate immune system component uses MHC I molecules directly in its defense strategy?
  - macrophages
  - neutrophils
  - NK cells
  - interferon
- Which of the following is both a phagocyte and an antigen-presenting cell?
  - NK cell
  - eosinophil
  - neutrophil
  - macrophage
- Which immune cells bind MHC molecules on APCs via CD8 coreceptors on their cell surfaces?
  - $T_H$  cells
  - CTLs
  - mast cells
  - basophils
- What “self” pattern is identified by NK cells?
  - altered self
  - missing self
  - normal self
  - non-self
- The acquired ability to prevent an unnecessary or destructive immune reaction to a harmless foreign particle, such as a food protein, is called \_\_\_\_\_.
  - the  $T_H2$  response
  - allergy
  - immune tolerance
  - autoimmunity
- Upon re-exposure to a pathogen, a memory B cell can differentiate to which cell type?
  - CTL
  - naïve B cell
  - memory T cell
  - plasma cell
- Foreign particles circulating in the blood are filtered by the \_\_\_\_\_.
  - spleen
  - lymph nodes
  - MALT
  - lymph
- Allergy to pollen is classified as \_\_\_\_\_.
  - an autoimmune reaction
  - immunodeficiency
  - delayed hypersensitivity
  - immediate hypersensitivity
- A potential cause of acquired autoimmunity is \_\_\_\_\_.
  - tissue hypersensitivity
  - molecular mimicry
  - histamine release
  - radiation exposure
- Autoantibodies are probably involved in \_\_\_\_\_.
  - reactions to poison ivy
  - pollen allergies
  - systemic lupus erythematosus
  - HIV/AIDS

14. Which of the following diseases is *not* due to autoimmunity?  
a. rheumatic fever                                      c. diabetes mellitus  
b. systemic lupus erythematosus                      d. HIV/AIDS
15. The structure of an antibody is similar to the extracellular component of which receptor?  
a. MHC I    c. BCR  
b. MHC II     d. none of these
16. The first antibody class to appear in the serum in response to a newly encountered pathogen is \_\_\_\_\_.  
a. IgM    b. IgA    c. IgG    d. IgE
17. What is the most abundant antibody class detected in the serum upon re-exposure to a pathogen or in reaction to a vaccine?  
a. IgM    b. IgA    c. IgG    d. IgE
18. Breastfed infants typically are resistant to disease because of \_\_\_\_\_.  
a. active immunity                                      c. immune tolerance  
b. passive immunity                                    d. immune memory

### Critical Thinking Questions

---

19. Different MHC I molecules between donor and recipient cells can lead to rejection of a transplanted organ or tissue. Explain the mechanism through which this occurs.
20. If a series of genetic mutations prevented some, but not all, of the complement proteins from binding antibodies or pathogens, would the entire complement system be compromised?
21. Explain the difference between an epitope and an antigen.
22. What is a naïve B or T cell?
23. How does the T<sub>H</sub>1 response differ from the T<sub>H</sub>2 response?
24. In mammalian adaptive immune systems, T cell receptors are extraordinarily diverse. What function of the immune system results from this diversity, and how is this diversity achieved?
25. How do B and T cells differ with respect to the antigens that they bind to?
26. Why is the immune response after reinfection much faster than the adaptive immune response after the initial infection?
27. What are the benefits and costs of antibody cross-reactivity?