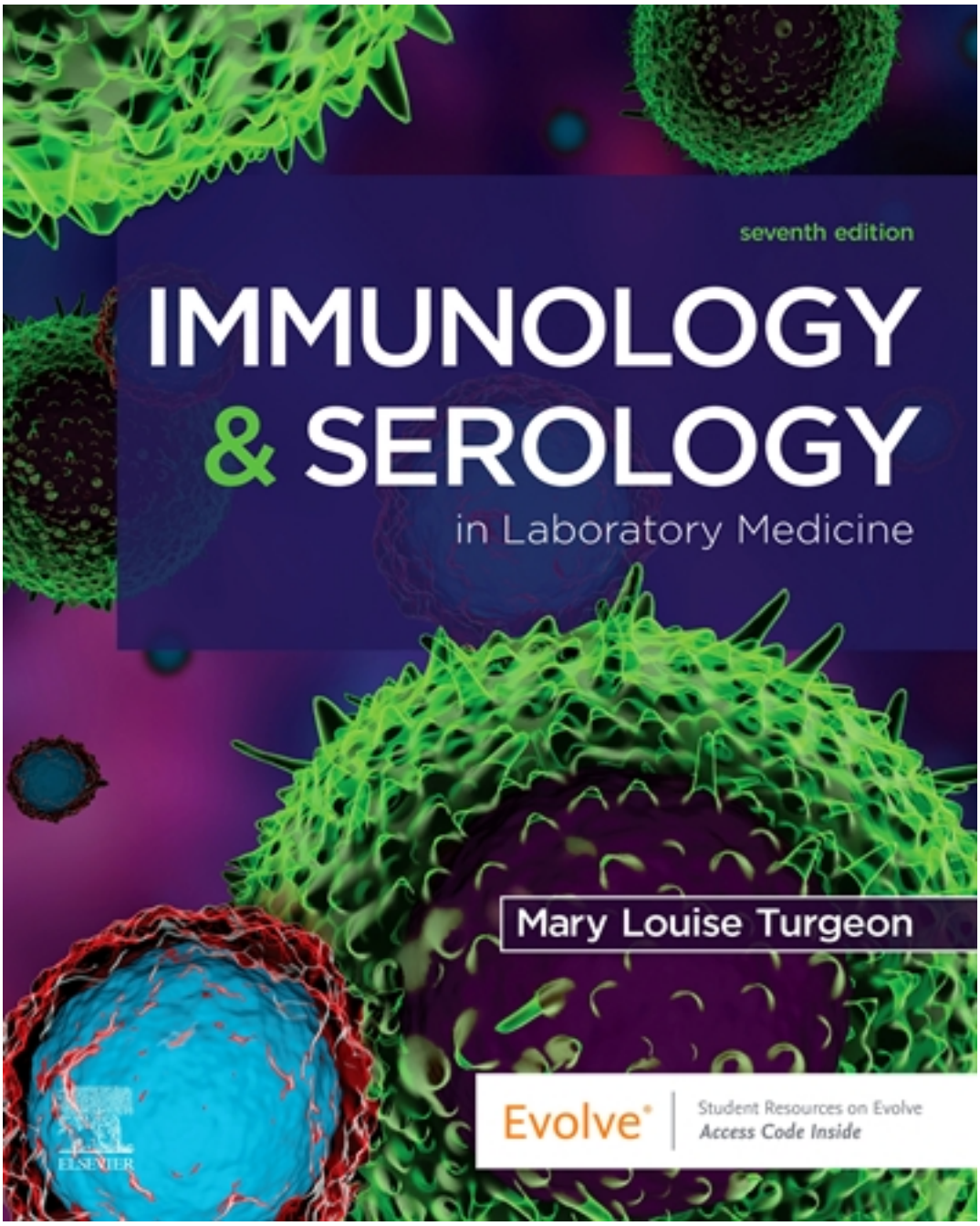
Test Bank for Immunology and Serology in Laboratory Medicine 7th Edition by Turgeon



Test Bank

Chapter 02: Soluble Mediators of the Immune System
Turgeon: Evolve Resources for Immunology & Serology in Laboratory Medicine, 7th Edition

MULTIPLE CHOICE

1. Complement is characterized by all the following *except*:
   a. collection of proteins synthesized in the liver.
   b. heat-labile series of 18 plasma proteins.
   c. normally present in the circulation in an inactive form.
   d. normally present in the circulation as an active enzyme.

   ANS: D
   Complement is a heat-labile series of 18 plasma proteins, many of which are enzymes or proteinases. Normally, complement components are present in the circulation in an inactive form.

   DIF: Cognitive Level: II

2. Functions of the complement system do not include
   a. host defense against infection, such as chemotaxis.
   b. clearance of apoptotic cells.
   c. clearance of immune complexes from the tissues.
   d. stimulation of lymphocyte proliferation

   ANS: D
   Overall functions of complement include host defense against infection, interface between innate and adaptive immunity, and disposal of waste.

   DIF: Cognitive Level: II

3. The classic complement pathway is activated by
   a. platelet factor 2.
   b. C3B.
   c. factor B.
   d. factor D.

   ANS: B
   The classic pathway is initiated by the bonding of the C1 complex, consisting of C1q, C1r, and C1s, to antibodies bound to an antigen on the surface of a bacterial cell.

   DIF: Cognitive Level: I

4. The alternate complement pathway is activated by
   a. bacterial exotoxins.
   b. viruses.
   c. antigen-antibody complexes.
   d. haptens.

   ANS: A

The alternate pathway is initiated by contact with a foreign surface such as the polysaccharide coating of a microorganism and the covalent binding of a small amount of C3b to hydroxyl groups on cell surface carbohydrates and proteins. The pathway is activated by low-grade cleavage of C3 in plasma.

DIF: Cognitive Level: I

5. The mannose-binding lectin pathway is initiated by
   a. platelet factor B.
   b. bacterial exotoxins.
   c. binding of MASP1 and MASP2 and another complex to arrays on the surface of a bacterial cell.
   d. antigen-antibody complexes.

   ANS: C
   The mannose-binding lectin pathway is initiated by binding of the complex of mannose-binding lectin and associated serine proteases (MASP1 and MASP2) to arrays of mannose groups on the surface of a bacterial cell.

   DIF: Cognitive Level: I

6. The activation of complement and the products formed during the complement cascade have a variety of physiologic and cellular consequences, including
   a. enhanced phagocytosis of pathogens.
   b. activation of basophils and mast cells.
   c. removal of immune complexes.
   d. cell lysis.
   e. All of the above.

   ANS: E
   The biological results of complement activation include: coating of pathogens (opsonization) to enhance phagocytosis; recruitment of phagocytes (e.g., neutrophils); cell activation (e.g., basophils and mast cells); immune-complex removal; and cell lysis.

   DIF: Cognitive Level: I

7. The complement component found in all the pathways is
   a. C1.
   b. C3.
   c. C4.
   d. factor H.

   ANS: B
   C3 represents the heart of the complement system and is common to all pathways.

   DIF: Cognitive Level: I

8. The complement cascade reaches its full amplitude at the stage of.
   a. C1
   b. C3
   c. C4
   d. factor H.

ANS: B
The complement cascade reaches its full amplitude at the C3 stage.

DIF: Cognitive Level: I

9. The membrane attack complex (MAC) is characterized by all the following *except*:
   a. MAC components are the same in the final common pathway of complement activation.
   b. C5-8 complex polymerizes C9 to form a tubule known as MAC.
   c. MAC allows for the influx of Na^+ and H_2O, which produces lysis.
   d. the complement cascade reaches full amplitude at this stage.

ANS: D
The MAC is a unique system that builds up a lipophilic complex in cell membranes from several plasma proteins. When fully assembled in the correct proportions, C7, C6, C5b, and C8 form the MAC. The C5bC6C7C8 complex polymerizes C9 to form a tubule (pore), which spans the membrane of the cell being attacked, allowing ions to flow freely between the cell's interior and exterior. By complexing with C9, the osmotic cytolytic reaction is accelerated. The consequence in a living cell is that the influx of sodium (Na^+) ions and H_2O leads to the disruption of osmotic balance, which produces cell lysis.

DIF: Cognitive Level: II

10. The alternate complement pathway is initiated
    a. by formation of antigen-antibody reactions.
    b. as a nonantibody-initiated pathway.
    c. without C1, C4, and C2.
    d. Both B and C.

ANS: D
In contrast to the classic pathway, which is initiated by the formation of antigen-antibody reactions, the alternate complement pathway is predominantly a nonantibody-initiated pathway. A key feature of the alternate pathway is that the first three proteins of the classic activation pathway—C1, C4, and C2—do not participate in the cascade sequence.

DIF: Cognitive Level: I

11. Increased complement levels can be observed in
    a. inflammatory conditions.
    b. excessive activation.
    c. genetic defects.
    d. Both B and C.

ANS: A
Increased complement levels are often associated with inflammatory conditions, trauma, or an acute illness, such as myocardial infarction. Low levels of complement suggest one of the following biologic effects:

- complement has been excessively activated recently.
- complement is currently being consumed.
- a single complement component is absent because of a genetic defect.

DIF: Cognitive Level: II

12. Increased susceptibility to pyogenic infections can be caused by
    a. deficiency of the opsonic activities of complement.
    b. any deficiency that compromises the lytic activity of complement.
    c. deficient function of the mannose-binding lectin pathway.
    d. All of the above.

    ANS: D
    Increased susceptibility to pyogenic bacteria can result from a deficiency of the opsonic activities of complement, a deficiency that compromises lytic activity of complement, or deficient function of the mannose-binding lectin pathway.

    DIF: Cognitive Level: II

13. Interferons
    a. are the principal mediator of the acute inflammatory response to gram-negative bacteria.
    b. mediate interactions between leukocytes.
    c. mediate the early immune response to viral infections.
    d. stimulate cell differentiation.

    ANS: C
    A characteristic of interleukins (ILs) is that secreted peptides and proteins mediate local interactions between leukocytes but do not bind antigen. ILs include molecules that are made by and that act on lymphocytes. The interferons (IFNs) are a group of cytokines discovered in virally infected cultured cells. This interference with viral replication in the cells by another virus led to the name *interferons*. Type I IFNs mediate the early innate immune response to viral infections. Tumor necrosis factor is the principal mediator of the acute inflammatory response to gram-negative bacteria and other infectious microbes.

    DIF: Cognitive Level: II

14. Which of the following characteristics is representative of C-reactive protein (CRP)?
    a. The first acute-phase reactant to become elevated
    b. Nonspecific indicator of inflammation
    c. Acute-phase reactant
    d. All of the above.

    ANS: D
    CRP is prominent among the acute-phase proteins because its changes show great sensitivity. CRP is a direct and quantitative measure of the acute-phase reaction, and as a result of its fast kinetics, provides adequate information about the actual clinical situation. In acute inflammation, CRP levels become elevated within the first 12 hours. CRP is nonspecific in terms of causation.

    DIF: Cognitive Level: II

15. The measurement of C-reactive protein (CRP) can be used for all the following *except*:
    a. monitoring healing after acute myocardial infarction.
    b. monitoring drug therapy with nonsteroidal anti-inflammatory agents.

c. predicting risk of myocardial infarction.
d. diagnosis of viral septicemia.

ANS: D
Traditionally, CRP has been used clinically for monitoring infection, autoimmune disorders and, more recently, healing after a myocardial infarction. Levels of CRP parallel the course of the inflammatory response and return to lower undetectable levels as the inflammation subsides.

DIF: Cognitive Level: II

16. The complement component, C3, is:
a. An acute-phase protein
b. Most common complement deficiency
c. Useful with results of anti-DNA in the diagnosis of systemic lupus erythematosus (SLE)
d. Associated with Raynaud's phenomenon

ANS: A
C3 is present in the plasma in the largest quantities; fixation of C3 is the major quantitative reaction of the complement cascade.

DIF: Cognitive Level: II

17. The complement component, C4, is:
a. An acute-phase protein
b. Most common complement deficiency
c. Useful with results of anti-DNA in the diagnosis of systemic lupus erythematosus (SLE)
d. Associated with Raynaud's phenomenon

ANS: C
A decreased C4 level with elevated anti–nDNA and antinuclear antibody (ANA) titers confirm the diagnosis of SLE in a patient. In these cases of SLE, the periodic assessment of C4 can monitor the progress of the disorder.

DIF: Cognitive Level: II

18. In adaptive immunity, cytokines mediate:
a. early inflammatory reactions to microbial organisms
b. stimulate adaptive immune responses.
c. mediate antigen-antibody reactions
d. stimulate the proliferation and differentiation of antigen-stimulated lymphocytes

ANS: D
Cytokines have a variety of roles in host defense. In innate immunity, cytokines mediate early inflammatory reactions to microbial organisms and stimulate adaptive immune responses. In contrast, in adaptive immunity, cytokines stimulate the proliferation and differentiation of antigen-stimulated lymphocytes and activate specialized effector cells (e.g., macrophages).

DIF: Cognitive Level: II