Kumar: Robbins and Cotran Pathologic Basis of Disease, 9th Edition

Chapter 03: Inflammation and Repair

Test Bank

MULTIPLE CHOICE

1. Transmembrane adhesive heterodimeric proteins, composed of an α and a ß chain, are expressed on activated leukocytes during inflammation. They bind primarily to intercellular adhesion molecule 1 (ICAM-1) and vascular cell adhesion molecule 1 (VCAM-1), both of which belong to the family of proteins known as
   a. selectins
   b. integrins
   c. immunoglobulins
   d. lectins
   e. growth factors

   ANS: C, Surface proteins expressed on activated leukocytes are integrins, and they bind to intercellular adhesion molecule 1 (ICAM-1) and vascular cell adhesion molecule 1 (VCAM-1), which belong to the immunoglobulin family of proteins.

2. Which of the following mediators of inflammation has chemotactic properties and is increased in persons taking aspirin?
   a. Thromboxane A_2
   b. Prostaglandin E_2
   c. Platelet-activating factor
   d. Leukotriene B_4
   e. Interleukin-1

   ANS: D, Leukotriene B_4 is chemotactic. It is increased in persons who take aspirin, because aspirin inhibits the cyclooxygenase pathway, thus shunting more arachidonic acid early derivatives into the lipoxygenase pathway. This promotes the synthesis of leukotrienes.

3. A 2-year-old child known to suffer from recurrent bacterial infections and poor wound healing was found to have leukocyte adhesion molecule deficiency 1 (LAD-1). The leukocytes of this patient do not express CD18, a molecule classified as belonging to the family of
   a. selectins
   b. integrins
   c. lectin type of vascular adhesion molecules
   d. aminotransferases
   e. glycosidases

ANS: B, LAD-1 is characterized by a deficiency of CD18, a cell surface molecule that is a ß$_2$ integrin. The infections occur because the defective leukocytes cannot adhere to endothelial cells, cannot spread and attach, and cannot phagocytose bacteria. PBD7 62

4. Bradykinin is produced from a high-molecular weight kininogen circulating in the blood. This reaction is mediated by
   a. coagulation factor X
   b. kallikrein
   c. Hageman factor
   d. complement C3
   e. protein C

   ANS: B, Kallikrein promotes the formation of bradykinin from the high-molecular weight kininogen. PBD7 67

5. Nitric oxide synthesis is augmented in endothelial cells by a calmodulin-mediated influx of which element?
   a. Calcium
   b. Sodium
   c. Potassium
   d. Oxygen
   e. Nitrate

   ANS: A, Endothelial cell nitric oxide synthase is constitutively expressed at low levels, but it can be increased by a calmodulin-mediated influx of calcium into the endothelial cells. PBD7 72

6. Which of the following mediators of inflammation causes pain?
   a. Nitric oxide
   b. Complement C3a
   c. Bradykinin
   d. Leukotriene B$_4$
   e. Interleukin-1

   ANS: C, Bradykinin causes pain. Other pain-causing substances are substance P and prostaglandin E$_2$. PBD7 65

7. Aspirin lowers the body temperature by inhibiting the synthesis of which regulator of the central thermostat in the hypothalamus?
   a. Leukotriene B$_4$
   b. Lipoxin
   c. Thromboxane A$_2$
   d. Prostacyclin
   e. Prostaglandin E$_2$

   ANS: E, Aspirin inhibits the action of cyclooxygenase, and thus inhibits the synthesis of

thromboxane A_2, prostacyclin, and prostaglandin E_2. However, only prostaglandin E_2 is involved in thermoregulation. The synthesis of lipoxin and leukotrienes is not inhibited by aspirin. PBD7 70

8. C-reactive protein binds to the surface of microbes in tissues acting as a(n)
   a. caspase
   b. peroxidase
   c. opsonin
   d. anaphylatoxin
   e. membrane attack protein

   ANS: C, C-reactive protein, an acute phase protein produced by the liver in acute and chronic inflammation, binds to microbes acting as an opsonin. Opsonization of bacteria facilitates phagocytosis.

9. Fibrillin is important for the scaffolding and deposition of which other component of the extracellular matrix?
   a. Collagen type I
   b. Collagen type III
   c. Elastic fibers
   d. Fibronectin
   e. Laminin

   ANS: C, Fibrillin, a 350 kD glycoprotein, is part of the microfibrils that are important for the scaffolding and deposition of elastic fibers. A congenital defect of fibrillin, as seen in patients with Marfan syndrome, is associated with reduced elasticity of arteries and formation of aneurysms.

10. Which growth factor is the most potent promotor of angiogenesis in the granulation tissue?
    a. Angiotensin
    b. Platelet-derived growth factor
    c. Tumor growth factor ß
    d. Vascular endothelial growth factor
    e. Epidermal growth factor

    ANS: D, Vascular endothelial growth factor (VEGF) is the most important promotor of angiogenesis in the granulation tissue.

11. A 20-year-old woman suffered extensive burns and developed large irregular scars over her hands. These scars limited the movement of her fingers, and she was unable to fully extend them. What are these lesions called?
    a. Contractures
    b. Desmoids
    c. Aggressive fibromatoses
    d. Keloids

e. Wound dehiscences

ANS: A, Contractures are extensive scars overlying the joints that limit movements and cause permanent flexure.