

2009 Miniboard Exam
General Pathology

1. The antimicrobial peptide produced by enterocytes is
 - A. Surfactant protein A
 - B. Surfactant protein D
 - C. Cathelicidins
 - D. β -defensins
 - E. α -defensins

2. Which of the following is an executioner caspase:
 - A. Caspase 2
 - B. Caspase 6
 - C. Caspase 8
 - D. Caspase 9
 - E. Caspase 12

3. All of the following are components of primary hemostasis except:
 - A. Platelet adhesion
 - B. Platelet granule release
 - C. Thrombin activation
 - D. Platelet shape change
 - E. Platelet recruitment

4. A nonhistone nuclear protein that has cytokine-like functions is:
 - A. Lysophosphatidylcholine
 - B. RANTES
 - C. HMGB-1
 - D. RAGE
 - E. MIP- β

5. All of the following are intermediate filaments, EXCEPT:
 - A. Desmin
 - B. Vimentin
 - C. Actin
 - D. Keratin
 - E. Glial

6. All of the following are antithrombotic; EXCEPT:
 - A. Nitrous oxide
 - B. PGI₂
 - C. AT III
 - D. Thrombomodulin
 - E. Thromboxane (TxA₂)

7. All of the following are components of platelet α - granules, EXCEPT:
 - A. Epinephrine
 - B. Fibrinogen
 - C. Platelet factor 4
 - D. Factor V
 - E. TGF- β

8. A cytokine that regulates differentiation and apoptotic death induced by NK cells is
 - A. TNF
 - B. IL-1
 - C. IL-12
 - D. IL-21
 - E. STAT 1

9. Activation of the unfolded protein response leads to activation of the endoplasmic reticulum- resident caspase:

- A. Caspase 3
- B. Caspase 6
- C. Caspase 7
- D. Caspase 9
- E. Caspase 12

10. The toll-like receptor (TLR) that LPS of gram negative bacteria binds is

- A. TLR7
- B. TLR4
- C. TLR9
- D. TLR3
- E. TLR5

11. Leukocyte adhesion deficiency disease type-1 is the result of defective:

- A. Selectins
- B. Integrins
- C. Cadherins
- D. Mucin-like glycoproteins
- E. Immunoglobulin family molecules

12. Which of the following is a protein expressed on the surface of apoptotic cells:

- A. Phosphatidylserine
- B. Annexin I
- C. Calreticulin
- D. Both A and B
- E. All of the above

13. Which of the following is a pro-apoptotic protein:

- A. PUMA
- B. XIAP
- C. Survivin
- D. BAG
- E. Insulin-like growth factor-1 (IGF-1)

14. Fibrillar collagens include all of the following EXCEPT

- A. type I
- B. type II
- C. type III
- D. type IV
- E. type V

15. The secretion of matrix metalloproteinases is inhibited by:

- A. PDGF
- B. TGF- β
- C. FGF
- D. TNF
- E. IL-1

16. T_H1 chronic inflammatory responses are induced by all of the following EXCEPT:

- A. IL-4
- B. IL-18
- C. IFN- γ
- D. IL-23
- E. IL-27

17. Which of the following is required for pluripotent stromal cell differentiation into osteoblasts:

- A. VEGF
- B. Sox9
- C. CBFA1
- D. PPAR γ
- E. FGF2

18. The main clotting factors inactivated by active Protein C are:

- A. Factors Xa and IXa
- B. Factors Xa and Va
- C. Factors Va and VIIIa
- D. Factors VIIIa and Xa
- E. Factors VIIa and Xa

19. Which of the following is NOT a function of Thrombin:

- A. Inhibits endothelial generation of Nitrous Oxide and PGI₂
- B. Critical in generation of cross-linked fibrin
- C. Induces platelet aggregation and secretion of TxA₂
- D. Activates endothelium to generate leukocyte adhesion molecules
- E. Induces monocytes and endothelial cells to secrete cytokine mediators

20. Macrophages are deactivated by all of the following EXCEPT:

- A. IL-10
- B. TGF- β
- C. CD47
- D. IFN- γ
- E. IFN- β

21. The primary chemokine that influences dendritic cells to enter lymph nodes is

- A. CCL21
- B. CCL20
- C. CCL2
- D. CCL5
- E. CCL10

22. Neprilysin is associated with which of the following

- A. Hydrolysis of neuropeptides and amyloid- β peptide
- B. A nuclear membrane protein that inverts during apoptosis
- C. An enzyme involved in carbohydrate metabolism
- D. An enzyme involved in fat metabolism
- E. Cerebral water balance

23. All of the following are considered components of interstitial matrix EXCEPT:

- A. Fibrillar collagens
- B. Proteoglycan
- C. Hyaluronan
- D. Laminin
- E. Elastin

24. Which of the following is NOT an effect of LPS in septic shock:

- A. Diminished myocardial contractility
- B. Systemic vasoconstriction
- C. Endothelial injury
- D. Increased leukocyte adhesion to endothelium
- E. Activation of coagulation system

25. Genome mutations involve:

- A. Rearrangement of genetic material with resultant structural changes in the chromosome
- B. Partial or complete deletion of a gene

- C. Loss or gain of whole chromosomes (gives rise to monosomy or trisomy)
 - D. A single nucleotide being replaced by a different nucleotide
 - E. One or two base pairs being inserted or deleted from DNA with resultant alteration in reading frame
26. Which of the following best defines genomic imprinting:
- A. A mutation that occurs postzygotically during early embryonic development
 - B. Inactivation of the paternal allele by the maternal allele resulting in its transcriptional silencing
 - C. A mutation that occurs at both alleles of a given gene locus
 - D. A disorder that manifest when a mutation occurs at only one allele of a given gene locus
 - E. A mutation carried on the X chromosome
27. Mycobacterial lipoarabinomannan and phosphatidylinositol dimannoside bind to which TLR:
- A. TLR2
 - B. TLR3
 - C. TLR4
 - D. TLR5
 - E. TLR9
28. Which of the following is NOT a single gene disorder with nonclassic inheritance:
- A. Triple repeat mutations
 - B. Mutations in mitochondrial genes
 - C. X-linked disorders
 - D. Disorders associated with genomic imprinting
 - E. Disorders associated with gonadal mosaicism
29. What is the activating receptor for Natural Killer (NK) cells:
- A. KIR (killer cell Ig-like receptor)
 - B. CD94 receptor
 - C. NKG2A receptor
 - D. NKG2B receptor
 - E. NKG2D receptor
30. The peptide binding cleft of MHC I is formed by:
- A. The α_1 domain and the β_2 microglobulin
 - B. The α_2 domain and the β_2 microglobulin
 - C. The α_2 domain and the α_1 domain
 - D. The α_2 domain and the α_3 domain
 - E. The α_3 domain and the β_2 microglobulin
31. Which cell responds to LTD₄ through CysLT₁:
- A. Eosinophil
 - B. Mast Cell
 - C. T cell
 - D. Neutrophil
 - E. Macrophage
32. Which of the following is NOT a feature of the epithelioid variant of hemangioma and hemangiosarcoma in the dog, horse, and cow:
- A. Neoplastic cells with occasional cytoplasmic vacuolation
 - B. Neoplastic cells that form glandlike acini and short ducts
 - C. Positive immunoreactivity of neoplastic cells for cytokeratin
 - D. Positive immunoreactivity of neoplastic cells for CD 31
 - E. Positive immunoreactivity of neoplastic cells for von Willebrand's factor
33. Which of the following does NOT contribute to the formation of reactive oxygen species:
- A. P-450 oxidase
 - B. Peroxisome oxidase
 - C. Mitochondrial respiratory chain enzymes
 - D. Cytosolic Ceruloplasmin

E. NADPH oxidase

34. Gravitational pooling of blood to the down side of the animal best defines:

- A. Rigor mortis
- B. Algor mortis
- C. Livor mortis
- D. Postmortem clotting
- E. Pseudomelanosis

35. Which protein inhibits the extrinsic pathway of apoptosis:

- A. FLIP
- B. Bcl-2
- C. IAPs
- D. p53
- E. Sphingolipid ceramide

36. Which of the following is NOT a characteristic of Ceroid:

- A. Accumulates rapidly
- B. Often has a deleterious effect on the cell
- C. Forms both intracellularly and extracellularly
- D. Forms mainly by autophagy
- E. Forms in response to severe malnutrition (e.g. - Vitamin E deficiency)

37. Which of the following is a prothrombotic property of endothelium:

- A. Tissue plasminogen activator
- B. PGI₂
- C. ADPase
- D. Plasminogen activator inhibitor-1
- E. Protein S

38. Which of the following mediators is responsible for leukocyte chemotaxis and activation:

- A. Substance P
- B. C5a
- C. C3a
- D. LTC₄
- E. Platelet-activating factor

39. Which of the following cell cycle inhibitors blocks *MDM2* and *MDM2*'s feedback regulation of *p53*:

- A. p21
- B. p14ARF
- C. p16INK4
- D. p27
- E. p57

40. Which cyclin/cdk is matched with the appropriate phase of the cell cycle:

- A. Cyclin E/cdk 3 with G₁ phase
- B. Cyclin E/cdk 2 with S phase
- C. Cyclin D/cdk 3 with S phase
- D. Cyclin D/cdk 4 with S phase
- E. Cyclin B/cdk 1 with G₂ phase

41. Which of the following is the correct sequence for the leukocyte adhesion cascade:

- A. Tethering→Margination→Rolling→Slow rolling→Activation by chemokines→Firm adhesion→Migration through endothelium
- B. Tethering→Margination→Rolling→Slow rolling→ Firm adhesion→ Activation by chemokines→ Migration through endothelium
- C. Margination→ Tethering→ Rolling→Slow rolling→Activation by chemokines→Firm adhesion→Migration through endothelium

D. Margination → Tethering → Rolling → Activation by chemokines → Slow rolling → Firm adhesion → Migration through endothelium
E. Margination → Tethering → Activation by chemokines → Rolling → Slow rolling → Firm adhesion → Migration through endothelium

42. Which of the following molecules specifically mediates transendothelial cell migration:

- A. PECAM-1
- B. P-selectin
- C. E-selectin
- D. Sialyl-Lewis X
- E. PSGL-1

43. Which of the following is a component of Neutrophil azurophil (primary) granules:

- A. Lysozyme
- B. Alkaline phosphatase
- C. Type IV collagenase
- D. Phospholipase A₂
- E. Myeloperoxidase

44. Which component of the complement cascade functions as an opsonin for phagocytosis

- A. C3a
- B. C5a
- C. C3b
- D. C4b2b
- E. MAC (C5b6789)

45. CD80 or CD86 (B7-1 and B7-2, respectively) on Antigen presenting cells binds to what molecule on CD4⁺ T cells to generate Signal 2:

- A. CD4
- B. CD3 proteins
- C. TCR heterodimers
- D. CD28
- E. ζ chains

46. The two primary cell types involved in a type III hypersensitivity reaction are

- A. Neutrophils and macrophages
- B. Neutrophils and T lymphocytes
- C. T lymphocytes and macrophages
- D. B lymphocytes and T lymphocytes
- E. Natural killer cells and macrophages

47. Which of the following is NOT a Type II hypersensitivity:

- A. Autoimmune hemolytic anemia
- B. Neonatal isoerythrolysis
- C. Myasthenia gravis
- D. Bullous pemphigoid
- E. Arthus reaction

48. The major fibril protein of cerebral amyloid angiopathy (amyloid of aging) is:

- A. AL
- B. AA
- C. A β
- D. IAPP
- E. A Cal

49. Which of the following will most likely result in the formation of a tumor:

- A. Application of multiple sequential promoters only
- B. Application of an initiator followed by multiple applications of sequential promoters

- C. Application of multiple sequential initiators only
- D. Application of a promoter followed by multiple applications of sequential initiators
- E. Application of a promoter followed by multiple applications of widely spaced initiators

50. Which target gene functions in both DNA repair and initiation of apoptosis (if repair fails):

- A. p21
- B. p16INK4a
- C. GADD45
- D. Cyclin D
- E. CDK 4