

**AFIP MINIBOARD EXAMINATION
MAY 2008**

GENERAL PATHOLOGY

1. All of the following are antithrombotic EXCEPT:
 - A. Protein C
 - B. Tissue-type PA
 - C. Antithrombin III
 - D. Tissue factor pathway inhibitor
 - E. Plasminogen activator inhibitor

2. Which of the following is a hallmark of malignant transformation:
 - A. Anaplasia
 - B. Dysplasia
 - C. Hyperplasia
 - D. Increased numbers of mitotic figures
 - E. Pleomorphism

3. The binding ligand (pathogen-associated molecular pattern) of fungal cell walls which is recognized by Toll-like receptors (TLRs) on leukocytes is:
 - A. LPS
 - B. Lipoteichoic acid
 - C. Mannose
 - D. N-formylmethionine
 - E. Glucan

4. All are true regarding survivin EXCEPT:

- A. Promotes apoptosis
- B. Essential for proper cell division
- C. Absent in terminally differentiated tissues
- D. Member of IAP family
- E. Expressed in thymus

5. Which of the following does not stimulate proteasome-mediated protein degradation?

- 1. Insulin
- 2. Glucocorticoids
- 3. Thyroid hormone
- 4. Tumor necrosis factor

- A. 1
- B. 1, 2
- C. 1, 2, 3
- D. 2, 3
- E. 3, 4

6. All of the following can induce thrombosis EXCEPT:

- A. Aneurysm
- B. Endotoxemia
- C. Vitamin K deficiency
- D. Protein losing nephropathy
- E. Increased fibrin degradation products

7. All of the following are essential alterations for malignant transformation EXCEPT:
- A. Self-sufficiency in growth signals
 - B. Sensitivity to growth-inhibitory signals
 - C. Evasion of apoptosis
 - D. Defects in DNA repair
 - E. Sustained angiogenesis
8. The adhesion molecule expressed predominately on lymphocytes is a:
- A. P-selectin
 - B. β_3 -integrin
 - C. β_5 -integrin
 - D. β_7 -integrin
 - E. JAM A
9. Severe combined immunodeficiency in horses results from a mutation in:
- A. RAG1
 - B. RAG2
 - C. RAG1 and RAG2
 - D. DNA-PKcs
 - E. DNA-PKas

10. Which of the following is not a hallmark of reversible cell injury?

1. Adenosine triphosphate depletion
2. Cell swelling
3. Loss of membrane permeability
4. Severe mitochondrial damage
5. Reduced oxidative phosphorylation

- A. 1
- B. 1, 2
- C. 3
- D. 3, 4
- E. 4, 5

11. All of the following are antithrombotic products of endothelium EXCEPT:

- A. Prostacyclin
- B. Nitric oxide
- C. Thrombomodulin
- D. Adenosine diphosphatase
- E. Urokinase-like plasminogen activator

12. All of the following are CDK inhibitors EXCEPT:

- A. p21
- B. p27
- C. p53
- D. p57
- E. p16INK4a

13. In the leukocyte adhesion cascade, neutrophils and endothelial cells must be activated for the occurrence of:

- A. Tethering
- B. Rolling
- C. Slow rolling
- D. Firm adhesion
- E. Transmigration

14. The defining characteristic of the primary (or azurophil) granules in neutrophils is the presence of

- A. Myeloperoxidase
- B. Cytochrome b
- C. Lysozyme
- D. Defensin
- E. Elastase

15. Regarding apoptosis, which of the following statements are true?

1. Affected cells are smaller in size
2. Chromatin condensation is common
3. Apoptotic cells are usually phagocytized by neutrophils
4. It does not occur in pathologic conditions
5. The intrinsic pathway is initiated by activation of cell surface death receptors

- A. 1
- B. 1, 2
- C. 1, 2, 3
- D. 1, 2, 3, 4
- E. 1, 2, 3, 4, 5

16. The sequence of primary hemostasis is:

1. Platelet adhesion
2. Platelet aggregation
3. Platelet shape change
4. Platelet recruitment
5. Release of ADP and TXA₂

- A. 1, 3, 5, 4, 2
- B. 1, 2, 3, 4, 5
- C. 4, 3, 2, 1, 5
- D. 4, 2, 3, 1, 5
- E. 4, 3, 1, 2, 5

17. Which of the following are protooncogenes?

1. H-RAS
2. HGF
3. PTEN
4. C-MYC

- A. 1, 2
- B. 1, 2, 3
- C. 1, 2, 3, 4
- D. 1, 4
- E. 1, 2, 4

18. All are true about canine leukocyte adhesion deficiency (CLAD) EXCEPT:

- A. Irish Setters are affected
- B. The deficiency results in proteolysis of E-selectin
- C. CLAD causes severe clinical disease
- D. Affected dogs have significant neutrophilia
- E. The molecular defect is in CD18

19. A factor important in the differentiation of osteoblasts is

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

20. All of the following are characteristic of cellular aging, EXCEPT:

1. Oxidative phosphorylation is reduced
2. Synthesis of nucleic acids is increased
3. Protein synthesis is decreased
4. The ability to repair chromosomal damage is reduced
5. Nuclei may be irregularly lobed

- A. 1, 2
- B. 2
- C. 1, 3
- D. 2, 4
- E. 5

21. Patients with Glanzmann's thrombasthenia have

- A. Decreased fibrinogen
- B. Dysfunctional Protein C
- C. Decreased thromboxane A2 release
- D. Decreased platelet fibrinogen receptor
- E. Decreased adherence of platelets to site of vascular damage

22. Integrins serve as receptors for which of the following components of the extracellular matrix?

- 1. Fibronectin
- 2. Laminin
- 3. Collagen
- 4. Vitronectin

- A. 1
- B. 1, 2
- C. 1, 2, 3
- D. 1, 2, 3, 4
- E. 1, 3

23. A protein that is important in the bridging of membranes and the fusion of phagosomes and lysosomes is:

- A. SNARE
- B. Fc portion of immunoglobulins
- C. JAM A
- D. C3b
- E. α -defensin

24. Fibrillar collagens include all of the following EXCEPT

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

25. All of the following cytomorphologic changes characterize irreversible cell injury EXCEPT:

1. Lysosomal swelling and disruption
2. Calcium entry into the cell
3. Acute cell swelling
4. Plasma membrane damage
5. Mitochondrial swelling with large amorphous densities

- A. 1, 5
- B. 2, 3
- C. 3
- D. 4, 5
- E. 5

26. All of the following promote platelet aggregation EXCEPT:

- A. ADP
- B. Calcium
- C. ATP
- D. Thrombospondin
- E. Thromboxane A₂

27. All of the following are morphological features of apoptosis EXCEPT:

- A. Cell shrinkage and convolution
- B. Intact cell membrane
- C. Pyknosis
- D. Karyorrhexis
- E. Karyolysis

28. Activated peroxisome proliferator-activated receptors (PPARs) are important in:

- A. Classical activation of T_H1
- B. Alternate activation of T_H2
- C. Reducing inflammatory responses
- D. Down-regulation of MHC II
- E. Ig/Fc internalization

29. The secretion of matrix metalloproteinases is inhibited by:

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

30. All of the following prevent free radical injury EXCEPT:

1. Vitamin C
2. Vitamin E
3. Superoxide dismutase
4. Sodium chloride
5. Glutathione peroxidase

- A. 1, 4
- B. 2, 3
- C. 3
- D. 4
- E. 4, 5

31. Calcium plays a role in

- A. Extrinsic Pathway
- B. Common Pathway
- C. Platelet aggregation
- D. A and C
- E. B and C

32. Which of the following are true regarding tumor evolution?

1. Initiation occurs first and is reversible
2. Promotion must follow initiation
3. Promoters are generally mutagenic
4. Progression occurs before promotion

- A. 1
- B. 1, 2
- C. 2
- D. 2, 3
- E. 1, 2, 3, 4

33. The migration of dendritic cells to lymph nodes is primarily under the influence of:
- A. GM-CSF
 - B. IL-4
 - C. MIP-1- α
 - D. CCL21
 - E. Mac-1
34. 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
35. The most common type of necrosis in the central nervous system is:
- A. Liquefactive
 - B. Coagulative
 - C. Caseous
 - D. Gangrene
 - E. Apoptosis

36. The binding of high molecular weight kininogen, factor XII and prekallikrein to altered endothelial surfaces results in all of the following EXCEPT:
- A. Fibrinolysis
 - B. Platelet aggregation
 - C. Complement activation
 - D. Activation of the intrinsic pathway
 - E. Activation of the extrinsic pathway
37. All of the following are types of epigenetic changes in cancer cells EXCEPT:
- A. Recombination
 - B. DNA methylation
 - C. Imprinting
 - D. Histone methylation
 - E. Histone acetylation
38. β -arrestin's function in the cell signaling pathway is:
- A. Terminating receptor activation
 - B. Blocking transcription factor release
 - C. Down-regulating the JAK/STAT pathway
 - D. Amplifying intrinsic tyrosine kinase activity
 - E. Causing irreversible binding of RAS-GTP to RAF

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

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

40. Blue-green discoloration of tissue caused by putrefactive bacteria is called:

- A. Softening
- B. Bile imbibition
- C. Hemoglobin imbibition
- D. Bloating
- E. Pseudomelanosis

41. Thrombin results in all of the following EXCEPT:

- A. Platelet aggregation
- B. Activates complement cascade
- C. Activates endothelium to produce t-PA
- D. Thromboxane A₂ secretion from platelets
- E. Activates mononuclear inflammatory cells

42. Which of the following are oncogenic viruses of animals?

1. Jaagsiekte sheep retrovirus
2. SV40 virus of primates
3. Feline immunodeficiency virus
4. Bovine leukosis virus
5. Avian reticuloendotheliosis virus complex

- A. 2, 3, 4
- B. 1, 2, 3, 4
- C. 1, 2, 3, 4, 5
- D. 1, 3, 4
- E. 2, 3, 4, 5

43. The cytosolic protein cryopyrin (also known as NALP3) is involved in:

- A. Pro-inflammatory host cellular defense response
- B. Cell cycle inhibition
- C. Anti-apoptotic activity in neoplasms
- D. Complement activation
- E. Oxygen-derived free radical generation

44. The initial tethering of platelets at sites of vascular injury is mediated by:

- A. Glycoprotein Ib/V/IX
- B. ADP
- C. Thrombin
- D. Epinephrine
- E. Thromboxane A₂

45. Concerning amyloidosis which of the following statements is true:

1. The most common form of amyloidosis in animals is immunocyte dyscrasia
2. A common site of amyloid deposition in old dogs is the kidney
3. The heart is the most frequent site of reactive amyloidosis
4. Deposition of amyloid-B has not been documented in dogs
5. Bence-Jones proteins are present in the urine with reactive amyloidosis

- A. 1, 2
- B. 2
- C. 3
- D. 2, 4
- E. 1, 5

46. The binding of heparin-like molecules to antithrombin III results in:

- A. Protein C activation
- B. Inactivation of factors Xa and IXa
- C. Proteolysis of factors Va and VIIIa
- D. Prostacycline release from endothelium
- E. Inactivation of tissue factors VIIa and Xa

47. Following DNA damage in a cell, transcription of what gene results in DNA repair?

- A. p53
- B. p21
- C. BAX
- D. GADD45
- E. p16INK4a

48. One chemical mediator which is associated with pain is:

- A. Nitric oxide
- B. C5a
- C. Bradykinin
- D. IL-1
- E. Leukotriene C₄

49. All of the following are considered components of interstitial matrix EXCEPT

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

50. Concerning fibronectin, which of the following statements is not true:

- 1. It binds to collagen
 - 2. It plays no role in neoplastic invasion
 - 3. It is not involved in wound healing
 - 4. It binds to fibrinogen
 - 5. It may play a role in opsonizing material for phagocytosis
- A. 1
 - B. 1, 2
 - C. 1, 2, 3
 - D. 2, 3
 - E. 2, 4, 5