Miniboard Exam- General Pathology 2010

1. *Mycobacterium avium* subsp. *Paratuberculosis* utililizes TLR2 to induce the production of which cytokine to promote survival in host mononuclear phagocytes:
A. IL-8
B. IL-10
C. IL-12
D. TNF-α
E. TGF-β

2. Which of the following results in **benign** adrenocortical tumors:
A. Dysregulated expression of the *IGF2* gene cluster
B. Activation of the Wnt/β-catenin pathway
C. Dysregulated cyclic adenosine monophosphate signaling
D. Inactivation of the p53 tumor suppressor
E. Increased expression of Cyclin B and Cyclin E

3. Caspase independent apoptosis is mediated by:
A. Granzyme A
B. Granzyme B
C. DISC (Death-inducing signaling complex)
D. c-FLIP
E. Toso

4. Leukotrienes have all of the following effects on leukocytes EXCEPT:
A. Increased production in bone marrow
B. Increased adhesion to blood vessel endothelium
C. Increased transmigration across vessel walls
D. Decreased survival in tissues
E. Increased activation in tissue

5. All of the following cause bone resorption EXCEPT:
A. Increased thyroid hormone
B. Increased glucocorticoids
C. Normal to increased estrogen
D. Increased parathyroid hormone
E. Increased PDGF (Platlet derived growth factor)

6. Which of the following are components of Bacillus anthracis toxin?
i. Ischemic factor
ii. Edema factor
iii. Lethal factor
iv. Toxin A
v. Protective antigen

A. i, iii, v
B. i, ii, iii
C. ii, iii, iv
D. ii, iii, v
E. i, iii, iv

7. All of the following are anti-apoptotic proteins except?

A. Bcl-2
B. Bax
C. Mcl-2
D. Bcl-XS
E. Bcl-XL

8. Which of the following increases mitochondrial permeability during apoptosis?
A. Bak
B. Bim
C. Bid
D. Bad
E. Cytochrome C

9. Which of the following is/are inhibited by protein C?
i. Factor Va
ii. Factor VIIIa
iii. Factor Xa
iv. Protein S
v. Thrombomodulin

A. i
B. i, ii
C. i, ii, iii
D. ii, iii, iv
E. iv, v

10. All of the following are inhibited by ATIII except?
A. Factor IIa
B. Factor VIIa
C. Factor IXa
D. Factor Xa
E. Factor XIIa

11. All are true concerning arterial thrombi EXCEPT:
A. Tend to grow retrograde from the point of attachment
B. Originate at sites of turbulence
C. Contain lines of Zahn
D. Are frequently occlusive
E. Tend to be gelatinous and are nonlaminated

12. T_H17 cells appear be most involved in which of the following hypersensitivities:
A. Type I
B. Type II

C. Type III
D. Type IV
E. T_H17 cells do not exist

13. All of the following concerning T_H17 cells are true, Except
A. Is in a subset of CD8+ T cells
B. Recruit neutrophils
C. Recruit monocytes
D. Serve as a host defense against bacteria
E. Involved in auto-immune reactions

14. The most potent eosinophil-activating cytokine known is:
A. IL-1
B. IL-2
C. IL-3
D. IL-4
E. IL-5

15. Which of the following is NOT found in platelet alpha granules:
A. Thrombospondin
B. Platelet factor 4
C. Serotonin
D. PDGF
E. Factor V

16. Firm adhesion is mediated by which of the following?
A. VCAM-1
B. PECAM-1
C. P-Selectin
D. β2 Integrins
E. β1 Integrins

17. Which of the following is not a preformed inflammatory protein?
A. Tachykinin
B. NO
C. Histamine
D. Serotonin
E. Bradykinin

18. Which of the following does NOT activate the alternate pathway of complement:
A. LPS

B. Fungal wall polysaccharides
C. Venoms
D. Plasmin
E. Activated Factor XII

19. Major leukocyte transmigration occurs in which of the following:
A. Postcapillary venules
B. Capillaries
C. Arterioles
D. Veins
E. A and B

20. Which of the following cytokines was shown to be associated with more severe disease involving cutaneous leishmaniasis:
A. IL-2
B. IL-4
C. IL-13
D. TNF-X
E. INF Gamma

21. All of the following are endogenous PAMP ligands EXCEPT:
A. Heparan sulfate
B. Heat shock protein 60
C. Mannose
D. Fibrinogen
E. Fibronectin

22. Which of the following is classified as a CX3C chemokine?
A. Lymphotactin
B. Fractalkine
C. Eotaxin
D. RANTES
E. Monocyte chemoattractant protein (MCP-1)

23. Which of the following are NOT an execution caspases?
i. Caspase 6
ii. Caspase 9
iii. Caspase 10
iv. Caspase 8
v. Caspase 3

A. i, iv

B. ii, iv
C. ii, iii, iv
D. i, v
E. i, ii, iii

24. All of the following are anti-apoptotic EXCEPT:
i. Bcl-2
ii. Bax
iii. Cytochrome c
iv. Bcl-x
v. Mcl-1

A. i
B. ii
C. iii, iv, v
D. i, ii
E. ii, iii

25. All of the following are functions of fibroblast growth factor (FGF) except:
A. Wound repair
B. Angiogenesis
C. Hematopoiesis
D. Lung maturation
E. All of the above are functions of FGF

26. Which of the following molecules is upregulated in canine distemper and may represent a putative receptor for the virus:
A. SLAM – CD150
B. ICAM – 1
C. CD18
D. CD95
E. CD31

27. Which of the following adhesion molecules is expressed on endothelium and stored in Weibel-Palade bodies:
A. PSGL-1
B. E-Selectin
C. P-Selectin
D. L-Selectin
E. VLA-4

28. Which of the following is involved in Natural Killer cell growth:

A. STAT-1
B. STAT-2
C. STAT-3
D. STAT-4
E. STAT-5
F. STAT-6

29. Which of the following acute phase proteins decrease with inflammation?
A. Fibrinogen
B. Mannose binding protein
C. Prealbumin
D. Haptoglobin
E. α1-antitrypsin

30. MiRNA (MicroRNA) inadvertently contributes to the formation of tumors by:
A. Decreased expression of tumor suppressor genes through overexpression of microRNA activity
B. Increased expression of oncogenes through significantly increased quantity or function of microRNA
C. MiRNA family activity targets cyclins for inactivation
D. MiRNA family activity targets BCL-2 for inactivation
E. MiRNA codes for proteins that act as hyperactivated signal transduction pathways

31. The genetic defect in the Birt-Hogg-Dubé gene resulting in hereditary multifocal renal cystadenocarcinomas and nodular dermatofibrosis of German Shepherds is the result of a(an):
A. Deletion
B. Amplification
C. Missense mutation
D. Histone acetylation
E. Gene conversion

32. Which of the following statements regarding epigenetic modification is true:
A. Epigenetic modifications are non-heritable changes in gene expression
B. Epigenetic modifications are often due to DNA mutations
C. DNA adenine nucleotide methylation is a common epigenetic modification
D. Epigenetic modifications only increase gene expression
E. Epigenetic modification mediates X chromosome inactivation

33. Which of the following statements regarding genetic transcription is true:
A. Hydroxylation of histone tails causes decreased gene transcription
B. Increased methylation of CpG islands causes increased gene transcription
C. Demethylation of histones within a maternal or paternal allele is a phenomenon called genomic imprinting
D. Acetylation of histone tails causes increased gene transcription

E. Phosphorylation of histone tails causes compaction of DNA into heterochromatin

34. Which cyclin-dependent kinase (CDK) and cyclin pair is correctly matched with the part of the cell cycle it reulates:
A. CDK1/Cyclin D : S phase
B. CDK2/Cyclin B : M/G1 checkpoint
C. CDK4/Cyclin E : G1/S checkpoint
D. CDK2/Cyclin B : G2/M checkpoint
E. CDK4/Cyclin D : G1 restriction point

35. In a normal cell cycle, which is the correct restriction point:
A. G0/G1 checkpoint
B. M/G1 checkpoint
C. G1/G2 checkpoint
D. G1/S checkpoint
E. S/G2 checkpoint

36. Which repair process is used for large defects in DNA:
A. Mismatch repair
B. Non-homologous end joining
C. Direct reversal
D. Nucleotide excision repair
E. Base excision repair

37. Which is the major mediator of tumor angiogenesis:
A. VEGF-A
B. PDGF
C. VEGF-C
D. Angiopoietin-1
E. Angiotstatin

38. Which of the following mediates vascular maturation:
A. VEGF-A
B. Delta-like ligand 4
C. Angiopoietin-1
D. VEGF-C
E. Angiostatin

39. Which of the following factors is the major mediateor of lymphangiogenesis:
A. VEGF-A
B. VEGF-B
C. VEGF-C
D. VEGF-D
E. Delta-like ligand 4

40. What is down-regulated in the transition of epithelial cells to mesenchymal cells:
A. FOXC2
B. E-cadherin
C. Beta-catenin
D. NF-kB

E. Snail

41. Myocardial reperfusion injury is mediated by:
A. Nitric oxide
B. IL-1
C. IL-10
D. IL-17
E. IL-23

42. Osteogenesis imperfecta affects which type of collagen:
A. Type I
B. Type III
C. Type IV
D. Type V
E. Type IX

43. Which type of collagen predominates in basement membrane:
A. Type I
B. Type III
C. Type IV
D. Type V
E. Type IX

44. Th1 cells are activated by which of the following:
A. IL-4
B. IL-5
C. IL-12
D. IL-13
E. IL-17

45. What facilitates T cell signaling after antigen binding:
A. Binding of CD3 on the T cell to CD28 on the antigen presenting cell
B. Binding of CD28 on the T cell to CD3 on the antigen presenting cell
C. Binding of CD80 or CD86 on the T cell to CD28 on the antigen presenting cell
D. Binding of CD28 on the T cell to CD80 or CD86 on the antigen presenting cell
E. None of the above

46. Which of the following is the correct order of events in ischemia:

A. Increased glycolysis → increased pH → decreased oxidative phosphorylation and ATP → influx of calcium → activation of lysosomal enzymes
B. Influx of calcium → decreased oxidative phosphorylation and ATP → increased pH → chromatin clumping → activation of lysosomal enzymes
C. Decreased pH → decreased oxidative phosphorylation and ATP → increased glycolysis → decreased protein synthesis → clumping of nuclear chromatin
D. Decreased oxidative phosphorylation and ATP → increased glycolysis → decreased pH → chromatin clumping → activation of lysosomal enzymes
E. Decreased oxidative phosphorylation and ATP → decreased glycolysis → decreased pH → activation of lysossomal enzymes

47. Which of the following is a mechanism by which infectious agents evade the immune system:
A. Molecular mimicry
B. Antigen masking
C. Imprinting
D. Receptor editing
E. Central tolerance

48. The Fenton reaction produces which of the following:
A. Hydroxyl radical
B. Water and oxygen
C. Hydrogen peroxide
D. Superoxide anion
E. Reduced glutathione

49. Cyclooxgenase (COX) produces all of the following except:
A. Prostacyclin
B. Thromboxane A2
C. Prostaglandin E2
D. Leukotriene D4
E. Prostaglandin D2

50. Which of the following is true regarding tumor development:
A. Initiated cells contain a reversible genetic change
B. Promotion increases proliferation of an initiated cell
C. Promoters are often mutagenic
D. Effects of promoters are usually irreversible
E. Initiation involves conveys metastatic potential to a malignant cell