

Candidate

DODVPR GPCP Seminar

2014

General Pathology Final (“Miniboard”) Exam

1. You have 1 HOUR to complete this 50-question multiple choice exam.
2. Write your candidate number above and on page 1 of the exam packet.
3. For each question, select the ONE best answer and mark it on the answer sheet.
4. Credit will be given only for correct answers recorded on the answer sheet.
5. All questions for which more than one answer is marked will be recorded as incorrect.
6. No credit will be awarded or deducted for incorrect answers.
7. Turn in **BOTH** your answer sheet and the exam question packet at the conclusion of the exam.

2014 Miniboard Exam

General Pathology Blank

Candidate

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____
25. _____

26. _____
27. _____
28. _____
29. _____
30. _____
31. _____
32. _____
33. _____
34. _____
35. _____
36. _____
37. _____
38. _____
39. _____
40. _____
41. _____
42. _____
43. _____
44. _____
45. _____
46. _____
47. _____
48. _____
49. _____
50. _____

51.

**2014 Miniboard Exam
General Pathology**

1. All of the following indicate apoptosis EXCEPT ____.
 - a. Agarose gel electrophoresis: Distinct bands of oligonucleosomes
 - b. Microscopic: Pyknosis, karyolysis, and karyorrhexis
 - c. Sequelae: Stromal collapse
 - d. Ultrastructural: Zeiosis

2. Which of the following is a self-transmissible, but *not* self-replicating, mobile genetic element that encodes machinery for integration into or excision from the bacterial chromosome?
 - a. Plasmid
 - b. Bacteriophage
 - c. Pathogenicity island
 - d. Integrative and conjugative element

3. Which of the following is a platelet-derived mediator with procoagulant effects?
 - a. Plasminogen activator inhibitor-1
 - b. Tissue factor pathway inhibitor
 - c. Platelet-derived growth factor
 - d. Protease nexin II

4. In the complement cascade, plasma properdin extends the half-life of otherwise labile ____.
 - a. C4b2b
 - b. C3bBb
 - c. C3bBb3b
 - d. Activated C1

5. The CD115 ligand that controls proliferation, differentiation, and survival of monocytes is ____.
 - a. GM-CSF
 - b. TGF- β
 - c. CSF-1
 - d. IL3

6. Efferocytosis induces the generation of all of the following EXCEPT ____.
 - a. TGF- β
 - b. NF κ B
 - c. VEGF
 - d. IL-10

7. In reference to horizontal bacterial gene transfer, transformation is ____.
 - a. the transfer of a plasmid from a donor bacterium through a pilus
 - b. the uptake of free environmental DNA from dead bacteria
 - c. direct transfer of a plasmid via bacteria-bacteria contact
 - d. injection of DNA into a bacterium by a bacteriophage

8. Superantigens cross-link ___ to the T-cell receptor, resulting in ___ T-cell activation.
- MHC class I; polyclonal
 - MHC class II; polyclonal
 - MHC class I; monoclonal
 - MHC class II; monoclonal
9. Which of the following is a multiprotein complex that prevents access of DNA repair proteins to telomeres?
- Telomerase
 - Shelterin
 - Rubicon
 - Sirtuin
10. A single base pair substitution that produces a change in a single amino acid that significantly alters the function of the translated protein is a ___.
- Missense mutation
 - Nonsense mutation
 - Frameshift mutation
 - Single nucleotide polymorphism
11. A low-dose toxin that triggers beneficial effects that surpass the repair of the triggering damage and contributes to improved cellular fitness elicits a ___ response.
- Nonthreshold linear
 - Nonmonotonic
 - Threshold
 - Hormetic
12. All of the following are types of CD4⁺FoxP3⁺ regulatory T-cells EXCEPT ___ cells.
- nT_{REG}
 - iT_{REG}
 - T_{H3}
 - Tr1
13. Which is FALSE regarding ceroid and lipofuscin?
- Lipofuscin derives from autophagy, whereas ceroid derives from heterophagy
 - Both pigments autofluoresce, and are positive for, Sudan black, and oil-red-O
 - Ceroid is only intracellular, whereas lipofuscin is intra- and/or extracellular
 - Ceroid is usually deleterious, whereas lipofuscin is not
14. Which of the following promotes the phosphorylation and ubiquitination of β -catenin?
- TCF
 - WNT
 - GSK3 β
 - E-cadherin

15. Under the influence of thrombin, endothelium becomes activated to produce all of the following mediators EXCEPT ____.
- PDGF
 - TXA₂
 - tPA
 - NO
16. The endothelial lateral border recycling compartment contains all of the following EXCEPT ____.
- CD99
 - JAM-A
 - Nepmucin
 - VE-cadherin
17. Prostaglandin E₂ (PGE₂) inhibits ____.
- Cell proliferation
 - Tumor angiogenesis
 - Metastatic potential
 - Normal immune response
18. Which is the most common major fibril protein type in amyloid of aging?
- AA
 - A β
 - APP
 - IAPP
19. Which of the following is a host cell receptor for foot and mouth disease virus?
- VP1
 - VP2
 - V β 3
 - NSP4
20. Which disease is the result of a primary cytotoxic hypersensitivity?
- Myasthenia gravis
 - Polyarteritis nodosa
 - Type I diabetes mellitus
 - Systemic lupus erythematosus
21. Which of the following correctly lists the major antiplasmins in order of first to bind and neutralize plasmin > second (after first is saturated) > third (after second is saturated)?
- α_1 -antitrypsin > α_2 macroglobulin > α_2 -antiplasmin
 - α_2 macroglobulin > α_2 -antiplasmin > α_1 -antitrypsin
 - α_2 -antiplasmin > α_2 macroglobulin > α_1 -antitrypsin
 - α_2 -antiplasmin > α_1 -antitrypsin > α_2 macroglobulin

22. In cancer biology, which is FALSE regarding the reprogramming of energy metabolism?
- Cancer cells limit energy metabolism largely to anaerobic glycolysis (“Warburg effect”)
 - Glycolysis provides intermediates for organelle biosynthesis and lactate for other cells
 - Both Ras oncoprotein and hypoxia independently increase levels of HIF1 α and HIF2 α
 - Cancer cells upregulate GLUT1 to compensate for low-efficiency ATP production
23. Cyanide causes toxic injury to cells by ____.
- Inactivating mitochondrial cytochrome oxidase, inhibiting oxidative phosphorylation
 - Causing membrane lipid peroxidation after conversion to a free radical by P-450
 - Binding sulfhydryl groups of cell membrane proteins, increasing permeability
 - Inhibiting sodium-potassium pumps, inhibiting ion transport
24. Osteoprotegerin ____.
- Induces the expression of RANKL by osteoblasts
 - Is produced by osteoblasts in response to TNF- α
 - Inhibits osteoclastic bone resorption by binding to RANK
 - Is produced by bone marrow stromal cells in response to TGF- β
25. All are downstream effects of Nix localization to the endoplasmic reticulum EXCEPT ____.
- Opening of mitochondrial permeability transition pores
 - Calcium release from endoplasmic reticulum
 - Formation of apoptotic bodies
 - ATP depletion
26. Which of the following is FALSE regarding regulation of autophagy?
- BCL-2 inhibits autophagy by inhibiting the Beclin 1 class III PI3 kinase complex
 - Stimuli that activate AMP-activated protein kinase promote autophagy
 - Rapamycin inhibits autophagy by activating mTOR signaling complex 1
 - Insulin inhibits autophagy by activating class I PI3 kinase
27. An inherited deficiency of which coagulation factor is least likely to cause clinical bleeding?
- Proconvertin
 - Hageman factor
 - Christmas factor
 - Stuart-Prower factor
28. In the leukocyte adhesion cascade, intraluminal crawling or “locomotion” is mediated by ____ expressed on transmigrating leukocytes.
- PECAM-1
 - L-selectin
 - Mac-1
 - LFA-1

29. All of the following transcription factors are known to promote pluripotency EXCEPT ____.
- Klf4
 - Lin28
 - C-JUN
 - C-MYC
30. Which of the following *E. coli* toxins causes an increase in intracellular concentrations of cyclic adenosine monophosphate (cAMP)?
- Heat stable enterotoxin
 - Heat labile enterotoxin
 - Verotoxin
 - K99 (F5)
31. Protein kinase C activates transcription factors when it is activated in the ____ pathway.
- MAP kinase
 - PI3 kinase
 - cAMP
 - IP3
32. Natural killer T lymphocytes recognize glycolipid antigens associated with ____.
- TLR2
 - CD25
 - CD1d
 - MHC class I
33. MMP-9 derived from ____ is more readily activated than MMP-9 derived from other cell types, because it is not complexed with TIMP-1.
- Mast cells
 - Fibroblasts
 - Neutrophils
 - Endothelial cells
34. Fractalkine is the ligand for ____, expressed on monocytes..
- CX3CR1
 - CXCR3
 - CCR5
 - CCR2
35. In response to endoplasmic reticulum stress, CHOP does all of the following EXCEPT ____.
- Downregulates BCL-2
 - Inactivates GADD34
 - Upregulates TRB3
 - Upregulates BIM

36. Which of the following is most likely to result in a protein-rich exudate?
- Paraquat
 - Gastric volvulus
 - Sodium retention
 - Intestinal lymphangiectasia
37. The Bielschowsky method to demonstrate neurites is what type of histochemical stain?
- Argentaffin
 - Argyrophilic
 - Silver impregnation
 - Oxidative-methenamine silver
38. During thymic deletion, ___ stimulates the presentation of “peripheral tissue-restricted” self-antigen to naïve T cells.
- CTLA-4
 - Foxp3
 - AIRE
 - RAG
39. Which of the following inhibits signaling downstream of the TGF β receptor?
- Co-SMAD
 - R-SMAD
 - SMAD3
 - SMAD7
40. All of the following PRRs are found on the plasma membrane EXCEPT ____.
- TLR2
 - TLR7
 - TLR10
 - NOD2
41. All of the following are derived from arachidonic acid EXCEPT ____.
- Epoxyeicosatrienoics
 - Prostaglandins
 - Resolvins
 - Lipoxins
42. Which is FALSE regarding the interactions between Notch signaling and VEGF?
- Notch-ICD is released by proteolytic cleavage by ADAM
 - Endothelial tip cells express Dll4, whereas stalk cells express Notch
 - Notch signaling causes decreased endothelial sprouting and proliferation
 - VEGF blockade decreases endothelial survival and increases vascular organization

43. GTPase-activating proteins bind active ____ and stimulate its inactivation, thus negatively regulating signaling through the ____ pathway.
- PLC- γ ; IP3
 - JAKs; JAK/STAT
 - PIP3; PI3 kinase
 - RAS; MAP kinase
44. Which is FALSE regarding the LDL receptor pathway and cholesterol metabolism?
- The LDL receptor ligand is apoprotein B-100, expressed on both LDL and IDL
 - In hepatocytes, exit of cholesterol from lysosomes requires NPC1 and NPC2
 - In hepatocytes, intracellular cholesterol inhibits the activity of acyl-coenzymeA
 - In hepatocytes, intracellular cholesterol inhibits the activity of HMG CoA reductase
45. Which of the following collagen types is a fibrillar collagen?
- IV
 - V
 - VI
 - VII
46. P2Y₁ and P2Y₁₂ are platelet receptors for ____.
- ADP
 - vWF
 - CD40L
 - α IIb β 3
47. p53 upregulates the transcription of all of the following EXCEPT ____.
- GADD45
 - CDKN1A
 - MDM2
 - BCL-2
48. Which of the following epigenetic alterations is least likely to be found in cancer?
- Hypermethylation of CpG islands in the promoter region of the *BRCA1* gene
 - Hypermethylation of CpG islands in the promoter region of the *VHL* gene
 - Hyperacetylation of histones in the *p21^{WAF1}* gene
 - Global genomic DNA hypomethylation
49. Selenium is an essential component of which antioxidant?
- Glutathione peroxidase
 - Glucuronyltransferase
 - Ceruloplasmin
 - Vitamin E
50. All of the following promote movement through the G1-S cell cycle checkpoint EXCEPT ____.
- E2F
 - TGF β
 - CDK2
 - PDGF