

Department of Biotechnology

Class: S.Y. BSc.

Semester: III

Subject: Immunology

Sample Questions

1. Complement component C3b_____.
 - A. Is an anaphylatoxin.
 - B. Is chemotactic.
 - C. Is the inactive form of C3.
 - D. Opsonizes bacteria
2. A complement component which is strongly chemotactic for neutrophils is_____.
 - A. C3
 - B. C3b
 - C. C5a
 - D. C5b
3. The initial complement component that is bound by complement-fixing antibodies is_____.
 - A. C1q
 - B. C1s
 - C. C3b
 - D. C5a
4. What is the origin of B-cell?
 - A. Pancreas
 - B. Liver
 - C. Thymus
 - D. Bone marrow
5. Which of the following cells has a high affinity receptor for IgE?
 - A. Dendritic cell
 - B. Mast cells
 - C. Eosinophils
 - D. Basophils
6. Name the macrophages which are associated central nervous system.

- A. Alveolar macrophages
 - B. Kupffer cell
 - C. Mesangial
 - D. Microglial cells
7. Name the dendritic cell, which does not function as antigen presenting cell?
- A. Follicular dendritic cell
 - B. Langerhans cell
 - C. Myeloid dendritic cell
 - D. Lymphoid dendritic cell
8. What is the main function of T-lymphocytes?
- A. Detect self tissue from foreign tissue
 - B. Filtration
 - C. Blood reservoir
 - D. Forms antibodies
9. What is not required in the innate immune responses?
- A. Antigen
 - B. strong immunity
 - C. pathogen
 - D. previous contact
10. The phagocytes can recognize pathogens by means of _____.
- A. necrosis factor
 - B. complement activation
 - C. pattern recognition receptors
 - D. adhesion molecules
11. Which of the following is an antimicrobial peptide synthesized by lymphocytes?
- A. Adhesions
 - B. Condensins
 - C. Defensins
 - D. Complement
12. The major role of the complement system is to work in conjunction with _____.
- A. antibodies to lyse cells via the C8 and C9 components
 - B. antibodies to lyses cells via the perforing molecules
 - C. antibodies to opsonize cells
 - D. the major histocompatibility complex for cell recognition
13. Complement fixation _____.

- A. can be modified by the Cholera toxin
 - B. has intrinsic Guanylate cyclase activity
 - C. can be desensitized by phosphorylation
 - D. is an effector function of IgG and IgM following antigen binding
14. Which type of immune cells are responsible for eradicating intracellular pathogens?
- A. natural killer cells
 - B. mast cells
 - C. neurons
 - D. specific lymphocytes
15. B and T lymphocytes arise from _____.
- A. hematopoietic stem cells
 - B. germ cells
 - C. somatic cells
 - D. spermatocytes
16. B and T cells are produced by stem cells that are formed in _____.
- A. Bone marrow
 - B. The liver
 - C. The circulatory system
 - D. The spleen
17. Which of the following is a function of T lymphocytes?
- A. Ingest large particles and cells by phagocytes
 - B. Produce and secrete antibodies
 - C. Interact with infected host cells through receptors on T-cell surface
 - D. Interact with macrophages and secrete cytokines
18. Which of the following components of complement possess the binding site for the Fc portion of antibodies _____
- A. C1s
 - B. C9
 - C. C1q
 - D. C3
19. Which type of antibody is most effective in activating complement?
- A. IgG1
 - B. IgG2
 - C. IgG
 - D. IgM

20. All of the following are secondary lymphoid organs except_____.
- A. Spleen.
 - B. Lymph nodes.
 - C. Bone marrow.
 - D. Mucosa associated lymphoid tissue
21. Which type of immune cells are not responsible for eradicating intracellular pathogens?
- A. natural killer cells
 - B. B cells
 - C. neurons
 - D. T lymphocytes
22. Plasma cells are the end cells of _____.
- A. T cells
 - B. Killer cells
 - C. Nk-cells
 - D. B cells
23. Complement component C3 is cleaved by_____.
- A. C3b
 - B. C3bBb
 - C. Factor B
 - D. Factor D
24. The membrane attack complex in the complement pathway consists of:
- A. C3b3b,Bb
 - B. C5b,6,7,8,9
 - C. Colicins
 - D. OH
25. Several of the complement components are_____.
- A. Antibodies
 - B. Cytokines
 - C. Enzymes
 - D. Glycolipids
26. The classical and alternative pathways meet at complement component_____.
- A. C3
 - B. C4
 - C. C4b
 - D. C5

27. Where do T-lymphocytes develop into fully competent but not activated T-cells?
- A. The thymus gland
 - B. The lymph nodes
 - C. The thyroid gland
 - D. The bone marrow
28. Which of the following presents antigenic peptide to T-cells in order to initiate an adaptive immune response?
- A. Plasma cell
 - B. Dendrite cell
 - C. Neutrophil
 - D. Epithelial cell
29. The component which is capable of lysing microorganisms is _____.
- A. C1-9
 - B. C5-9
 - C. C3-5
 - D. C8-9
30. B cells mature in the _____ while T cells mature in the _____.
- A. Thymus/bone marrow and gut associated lymphoid tissue (GALT)
 - B. Spleen/bone marrow and GALT
 - C. Bone marrow and GALT/Thymus
 - D. Liver/Kidneys
31. Which of the following is a function of B lymphocytes?
- A. Ingest large particles and cells by phagocytes
 - B. Produce and secrete antibodies
 - C. Interact with infected host cells through receptors on T-cell surface
 - D. Interact with macrophages and secrete cytokines
32. Inflammation reaction is brought about by _____.
- A. Plasma cells
 - B. Mast cells
 - C. Macrophages
 - D. Adipose cells
33. Which one engulfs foreign materials _____.
- A. Macrophages

- B. Plasma cells
 - C. Mast cells
 - D. Lymphocytes
34. Which of the following chaperones are bound to MHC class I α chain and β 2 microglobulin and facilitate the formation of MHC- class I α , β 2 microglobulin, and antigenic peptide trimers?
- A. Calnexin & Calreticulin
 - B. Calreticulin & Tapasin
 - C. Calnexin & Tapasin
 - D. Calnexin & Ubiquitin
35. Which of the following is not the function of helper T cells is _____.
- A. Produce soluble signaling proteins called cytokines, which include the interleukins
 - B. They help activate cytotoxic T cells to kill infected target cells
 - C. They help activate B cells to secrete antibodies and macrophages to destroy ingested microbes
 - D. They recognize and bind extracellular ligand
36. Which of the following statements is true about TNF alpha?
- A. Evoke T cells
 - B. Induce TGF beta production
 - C. Decrease vascular permeability
 - D. Increase expression adhesion molecule
37. Which of the following is incorrect concerning MHC class II molecules?
- A. B cells may express different MHC class II molecules on their surface.
 - B. MHC class II molecules are synthesized in the endoplasmic reticulum of many cell types.
 - C. Genetically different individuals express different MHC class II alleles.
 - D. MHC class II molecules are associated with β 2-microglobulin on the cell surface
38. Which of the following is the first step in the specific immune response to antigen?
- A. Memory cell formation
 - B. Secretion of antibody molecules
 - C. Antigen presentation to T helper cell
 - D. Secretion of cytokines by T helper cell

39. Which type of T cell produce cytokines that stimulate B cell differentiation and lead to antibody production?
- A. Cytotoxic T cells.
 - B. TH1 cells.
 - C. TH2 cells.
 - D. NK T cells.
40. CD8 _____.
- A. Binds directly to peptide antigen.
 - B. binds to a variable portion of MHC class II molecules.
 - C. binds to a constant portion of MHC class I molecules.
 - D. binds to CD4 on the T cell surface
41. Which of the following statements concerning T-cell development is correct?
- A. Interaction with thymic non-lymphoid cells is critical.
 - B. Maturation in the thymus requires the presence of foreign antigen.
 - C. MHC class II molecules are not involved in positive selection
 - D. Progenitor T cells that enter the thymus from the bone marrow have already rearranged their T cell receptor gene
42. The development of self-tolerance in the T-cell compartment is important for the prevention of autoimmunity. Which of the following are examples of peripheral tolerance?
- A. Ignorance
 - B. negative selection
 - C. thymocyte proliferation
 - D. positive selection
43. Which of the following non-classical MHC molecule impede the exchange of CLIP peptide with antigenic peptide
- A. HLA-DI
 - B. HLA-DM
 - C. HLA-DQ
 - D. HLA-DO
44. Which of the following acts as a coreceptor for B-cell activation?
- A. CD28
 - B. IL-2
 - C. IgA
 - D. CD19

45. Antigens that do not require the involvement of T-cells for the activation of B-cells are _____.
- A. thymus-dependent
 - B. thymus-independent
 - C. intracellular pathogens
 - D. facultative anaerobes
46. Some of the activated B-cells lead to the formation of short-lived _____.
- A. plasma cells
 - B. evanescent waves
 - C. memory cells
 - D. thymus cells
47. B-lymphocytes that do not differentiate into plasma cells are called _____.
- A. T-lymphocytes
 - B. Helper T-cells
 - C. Memory B cells
 - D. Memory T-cells
48. Which MHC molecule recognizes CD8 TC cells?
- A. MHC I
 - B. MHC II
 - C. MHC III
 - D. HLA-C
49. Mark the one, which is not a lymphoid progenitor cell.
- A. Monocyte
 - B. B-cell
 - C. T-cell
 - D. NK cells
50. The area of contact between membranes of a T cell and an antigen-presenting cell where a clustering of protein-protein interactions occur is called a(n) _____.
- A. Polarization
 - B. cross-presentation center
 - C. granuloma
 - D. immunological synapse
51. Which of the following is not produced by cytotoxic T cells?

- A. IFN- γ
 - B. CD40 ligand
 - C. TNF- α
 - D. Lymphotoxin
52. _____ of thymocytes is necessary to produce a T-cell repertoire capable of interacting with self-MHC molecules.
- A. Positive selection
 - B. Negative selection
 - C. Apoptosis
 - D. Receptor editing
53. Which of the following characteristics is common to both T-cell receptors and immunoglobulins?
- A. Somatic recombination of V, D and J segments is responsible for the diversity of antigenbinding sites.
 - B. Somatic hypermutation changes the affinity of antigen-binding sites and contributes to further diversification.
 - C. Class switching enables a change in effector function.
 - D. The antigen receptor is composed of two identical heavy chains and two identical light chains.
54. MHC class II molecules are made up of two chains called _____, whose function is to bind peptides and present them to _____ T cells.
- A. alpha and beta (β); CD4
 - B. alpha and beta2-microglobulin (β 2m); CD4
 - C. alpha and beta ; CD8
 - D. alpha and beta2-microglobulin (β 2m); CD8
55. MHC molecules have promiscuous binding specificity. This means that_____.
- A. a particular MHC molecule has the potential to bind to different peptides
 - B. when MHC molecules bind to peptides, they are degraded
 - C. peptides bind with low affinity to MHC molecules
 - D. none of the above describes promiscuous binding specificity.
56. Fragments of antigens are held at the surface of antigen presenting cells by _____.
- A. Histones
 - B. Antibodies
 - C. major histocompatibility complex
 - D. Epitope
57. Cell mediated immunity is carried out by _____ while humoral immunity is mainly carried out by_____.

- A. B cells/T cells
 - B. Epitopes/Antigens
 - C. T cells/B cells
 - D. Antibodies/Antigens
58. The first tenet of clonal selection theory relies specifically_____.
- A. combinatorial joinings.
 - B. somatic mutations.
 - C. variations in the splicing process.
 - D. B-cell clones.
59. Synthesis of antibodies takes place by which of the following cells?
- A. Bone marrow cells
 - B. T-cells
 - C. B-cells
 - D. Lymph
60. MHC class I is a cell surface molecule present on_____.
- A. B cells
 - B. all nucleated cells
 - C. APCs
 - D. T cells
61. MHC class II is a cell surface molecule present on_____.
- A. B cells
 - B. all nucleated cells
 - C. APCs
 - D. T cells
62. Which of the following describes an activated dendritic cell upon arriving in a lymph node?
- A. Located in follicles and medulla of the lymph node
 - B. Associated mainly with antigen uptake and processing
 - C. Bears highly elaborated finger-like processes called dendrites
 - D. Expresses low levels of MHC class II molecule
63. T cells recognise antigen_____.
- A. In a 3 dimensional form
 - B. In solution in the plasma
 - C. When presented on the surface of antigen presenting cells
 - D. Following presentation by pattern recognition receptors

64. CD4 T cells are generally restricted by _____.
- A. CD-1
 - B. MHC class –I
 - C. MHC class-II
 - D. β 2 microglobulin
65. Which of the following is responsible for B-cell activation?
- A. Infection
 - B. Antibody
 - C. Antigen
 - D. Allergy
66. In case of acquired immune system, a secondary immune response is generated by the _____.
- A. memory B-cells
 - B. germ cells
 - C. lymphoid tissues
 - D. antigens
67. Which is not application of RIA?
- A. It is used to assay the presence of hepatitis B surface antigen in donated blood.
 - B. In analysis of vitamin like riboflavin
 - C. T4 & T3 measurement
 - D. Digitoxin or digoxin in patients receiving these drugs and measurement its concentration.
68. For the separation of antigens the method used is _____.
- A. Immunoelectrophoresis
 - B. Flocculation
 - C. Agglutination
 - D. Precipitation
69. When a particular antigen is mixed with antibody in the presence of an electrolyte at suitable temperature and pH the particles are clumped, this is called _____.
- A. CIE
 - B. Agglutination
 - C. Precipitation
 - D. Electrophoresis
70. The widal test is a type of _____.

- A. Agglutination
- B. Precipitation
- C. Immunofluorescence
- D. Complement fixation

71. An example of complement fixation test is _____.

- A. Weil Felix reaction
- B. Wasserman's reaction
- C. Coomb's test
- D. Rose Waller test

72. What indicator system is used in complement fixation test?

- A. Protein
- B. RBC
- C. Enzyme
- D. WBC

73. The formation of _____ is a positive result in the VDRL test.

- A. Flocculant
- B. Precipitin
- C. Coagulation
- D. a bright pink colour

74. When using antisera to characterize bacteria, we will often link the antibodies to _____ to better visualize the agglutination.

- A. latex beads
- B. red blood cells
- C. other bacteria
- D. white blood cells

75. The direct Coombs' test is designed to detect when people have a disease that causes them to _____.

- A. have an excessively high fever.
- B. quit making antibodies.
- C. make too many red blood cells.
- D. produce antibodies that bind to their own red blood cells.

76. In an enzyme immunoassay, the enzyme _____.

- A. is bound by the antibody's antigen-binding site.
- B. is attached to the well of a microtiter plate.
- C. is conjugated to the suspect antigen.
- D. is bound to the constant region of the secondary antibody.

77. In a direct fluorescent antibody test, which of the following would we most likely be looking for using a fluorescently-labelled mAb?
- A. bacteria isolated from a patient and grown on agar plates
 - B. bacteria in a patient sample
 - C. antiserum from a patient smeared onto a glass slide
 - D. antiserum from a patient that had bound to antigen-coated beads
78. Hemolytic system for complement fixation reaction consist of _____.
- A. hemolytic serum
 - B. 3 per cent suspension of sheep erythrocytes
 - C. 5 per cent suspension of human erythrocytes
 - D. 3 per cent suspension of sheep erythrocytes and hemolytic serum
79. The first system of the complement fixation reaction consist of _____.
- A. an antigen, complement, sheep erythrocytes
 - B. an antibody, complement, hemolytic serum
 - C. an antigen, complement, sheep erythrocytes, hemolytic serum
 - D. an antigen, an antibody, complement
80. Standard quantitative method is a _____.
- A. slide agglutination
 - B. microagglutination
 - C. tube agglutination
 - D. microprecipitation
81. When performing an FEIA, the fluorogen replaces the _____ that is used in an EIA.
- A. Antigen
 - B. chromogenic substrate
 - C. enzyme
 - D. secondary antibody
82. Kahn test used to diagnosis of _____.
- A. AIDS
 - B. Syphilis
 - C. Typhoid
 - D. Pneumonia
83. VDRL is example of _____.
- A. Tube flocculation test
 - B. Slide flocculation test
 - C. Tube precipitation test

- D. Slide precipitation test
84. Ring test is not used for _____.
- A. Typing of streptococci and pneumococci
 - B. C-reactive protein test
 - C. Ascoli's thermoprecipitation test
 - D. Widal test
85. Widal test is used to diagnose _____.
- A. Syphilis
 - B. Typhus fever
 - C. Typhoid
 - D. AIDS
86. Direct immunofluorescence test is used to detect _____.
- A. Ag
 - B. Ab
 - C. Ag-Ab complex
 - D. T cell
87. _____ not type of ELISA.
- A. Direct ELISA
 - B. Indirect ELISA
 - C. Competitive ELISA
 - D. Sandwich ELISA
88. Which technique is used to assay drug concentration in plasma?
- A. IR spectroscopy
 - B. UV spectroscopy
 - C. Non aqueous titration
 - D. RIA
89. Which sentence is not true about RIA?
- A. The most commonly used radiolabels in RIA are tritium and iodine.
 - B. Centrifugation rpm is 1200-2500.
 - C. This technique is very sensitive it can detect 0.001 $\mu\text{g/ml}$
 - D. This technique is very sensitive it can detect 0.01 $\mu\text{g/ml}$
90. RIA was developed by _____.
- A. Berson & Yalow
 - B. Chalk & Wastone
 - C. Vector & Logan
 - D. Lewis & Bronstead

91. How many microgram antigen detected in sample by RIA?
- A. 0.1 $\mu\text{g/ml}$
 - B. 0.0001 $\mu\text{g/ml}$
 - C. 0.001 $\mu\text{g/ml}$
 - D. 0.01 $\mu\text{g/ml}$
92. Ascoli's thermoprecipitin test is a example of _____.
- A. Ring test
 - B. Tube flocculation test
 - C. Slide agglutination test
 - D. Flask test
93. How many systems does include the complement fixation reaction_____.
- A. 2 systems
 - B. 4 systems
 - C. 3 systems
 - D. 5 systems
94. Amount of various immunoglobulin classes can be measured by_____.
- A. Double diffusion in one dimension
 - B. Single diffusion two dimension
 - C. Single diffusion two dimension
 - D. Double diffusion two dimension
95. The direct Coombs' test is designed to detect when people have a disease that causes them to _____.
- A. have an excessively high fever.
 - B. quit making antibodies.
 - C. make too many red blood cells.
 - D. produce antibodies that bind to their own red blood cells.
96. The bond involved in antigen antibody interaction are _____.
- A. Weak hydrogen bond and vanderwall's forces
 - B. Weak covalent bond
 - C. Strong covalent bond
 - D. Strong disulphide bond
97. Precipitation reaction is relative less sensitive for detection of_____.
- A. Antigen
 - B. Antibody
 - C. Complement
 - D. Antigen –antibody complex

98. Agglutination reaction is more sensitive than precipitation for detection of _____.

- A. Antigen
- B. Antibody
- C. Complement
- D. Antigen –antibody complex

99. Opsonization refers to _____.

- A. adherence to mucosal epithelial cells.
- B. antibody mediated viral inactivation.
- C. coating of microorganisms or other particles by antibody and/or complement.
- D. parasitic lysosomal degranulation.

100. ELISA (enzyme-linked immunosorbent assay) allows for rapid screening and quantification of the presence of _____ in a sample.

- A. Amino acid
- B. DNA
- C. Antigen
- D. Proteins