國立臺灣大學95學年度碩士班招生考試試題

※ 注意：請用 2B 鉛筆作答於答案卡，並先詳閱答案卡上之「畫記說明」。

多重選擇題， 2.5points/question，每題 5 個選項，每個選項 0.5 分，答錯會倒扣至每題零分為止。

1. Eicosanoids are synthesized by phospholipid oxygenation. Which description of these lipid mediators is correct?
   (A) They can not be produced by immune-related cells
   (B) Florid effects on vascular endothelial cells
   (C) They are quite stable after synthesis
   (D) Specific eicosanoid receptors have been found
   (E) They do not accumulated in the cells
2. Which molecule is not involved in the cell apoptosis?
   (A) Fas receptor
   (B) p53
   (C) Tyrosine phosphatase
   (D) Caspase
   (E) Serine protease
3. Bacterial lipopohysaccharide (LPS, endotoxin) exhibits many biological effect including
   (A) Increased vascular permeability
   (B) Enhancing phagocytosis
   (C) Thrombocytosis
   (D) T cell activation
   (E) Neurotoxicity
4. Cancer metastasis may involve
   (A) Increase TNF-α production by cancer cells
   (B) Overexpression of MHC class I molecules on cancer cells
   (C) Decreased production of NO by cancer cells
   (D) Increase matrix degradation by cancer cells
   (E) Decreased cadherin expression on cancer cells
5. Breakdown of the oxidative reaction of amino acids is found in the organelle of
   (A) Exosome
   (B) Ribosome
   (C) Lysosome
   (D) Peroxisome
   (E) Nucleolus
6. Which property is ture for the protein molecule?
   (A) Protein only contains amino acids
   (B) Protein possesses three-dimentional structure
   (C) Protein is equal polypeptide
   (D) Protein has characteristic amino acid compositions
   (E) Carbohydrate fails to enhance the stability of protein molecule

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7. The enzyme activity can be modified by
   (A) Phosphorylation
   (B) Glycosylation
   (C) Nitrosylation
   (D) Lipoxylation
   (E) All of the above
8. The major structure component of extra-cellular matrix in connective tissue is
   (A) Cellulose
   (B) Chitin
   (C) Chondroitin sulfate
   (D) Proteoglycan
   (E) Heparan sulfate
9. Which technique can be applied to the detection of mRNA?
   (A) Real-time PCR
   (B) Northern blot
   (C) cDNA microarray
   (D) In situ hydridization
   (E) ELISA
10. Cytokine can mediate the physiological activity of
   (A) Apoptosis
   (B) Protein glycosylation
   (C) Hematopoiesis
   (D) Immunomdulation
   (E) Cell growth
11. Acute phase reactants are induced by
   (A) Allergic reaction
   (B) Hypoxia
   (C) Tissue damage
   (D) Proinflammatory cytokines
   (E) Neovasculization
12. Which environmental factor can affect the phenotypical expression of a hereditary disease?
   (A) Diet
   (B) Climate
   (C) Geographic factor
   (D) Occupation
   (E) Age
13. Serum complements mediate many biological functions except
   (A) Cell apoptosis
   (B) Anaphylactoid reaction
   (C) Immune complex solubilization
   (D) Immune adhesion
   (E) Redox

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14. Select the correct adhesion molecule from below!
    (A) C-reactive protein
    (B) Integrin
    (C) Selectin
    (D) Collagen
    (E) Gamma-globulin
15. Cellular immunity includes
    (A) Bacteriolysis
    (B) Allograft rejection
    (C) Phagocytosis
    (D) Chemotaxis
    (E) Tumoricide
16. Inflammatory reaction can be elicited by
    (A) Infections
    (B) UV irradiation
    (C) Thermal injury
    (D) PGE2
    (E) Nitric oxide
17. Major histocompatibility complex (MHC) class II molecule can restrict
    (A) suppressor T cells
    (B) Natural killer cells
    (C) Polymorphonuclear phagocytes
    (D) Delayed type T cells
    (E) Helper T cells
18. Major histocompatibility complex (MHC) class I molecule is expressed on many cells except
    (A) Hepatocytes
    (B) Red blood cells
    (C) Neurons
    (D) Osteoblasts
    (E) Platelets
19. Which molecule belongs to the category of "paracrine"?
    (A) Insulin
    (B) Estrogen
    (C) Interleukin 2
    (D) Prostaglandin E2
    (E) Adrenal corticosteroids
20. Which virus belongs to the category of DNA virus?
    (A) Hepatitis B virus
    (B) Rubella virus
    (C) Human immunodeficiency virus
    (D) Influenza virus
    (E) Hepatitis A virus

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21. Antibody is indispensable for biological research. The generation of a specific antibody depends on the nature and amount of antigen used and the schedule of immunization and host animals. Which of the following statement(s) is (are) true? (A) The younger the host animal the better quality antibody may be generated. (B) The higher the titer (concentration) means the better quality of an antibody. (C) IgG is more specific than IgM. (D) More frequent immunization schedule and larger amounts of antigen can generate better antibody. (E) None of these statements is true.
22. Cellular protein-protein interactions responsible for the assembly of a multiprotein complex are usually mediated by (A) ionic interactions, (B) hydrophobic interactions, (C) disulfide linkages, (D) peptide bonds, (E) glycosylations.
23. Hemoglobulin contains 0.34% iron. A gram-atom of Fe weighs 55.85. The minimum MW of hemoglobulin is (A) 15030, (B) 15580, (C) 16210, (D) 16420, (E) 16720.
24. Which of the properties of stem cells distinguish them from cancer cells? (A) The ability to divide symmetrically, (B) The ability to reproduce themselves indefinitely, (C) The ability to divide asymmetrically, (D) The ability to survive under stress conditions, (E) none of these.
25. Ethyleneimine reacts with cysteine side chains in proteins to form S-aminoethyl derivatives. The peptide bonds on the carboxyl side of the modified cysteine residues are susceptible to hydrolysis by (A) chymotrypsin, (B) trypsin, (C) subtilisin, (D) carboxypeptidase A, (E) elastase.
26. Which of the following key enzyme is responsible for sphingolipid biosynthesis? (A) ceramidase, (B) HMG-CoA reductase, (C) sphingomyelinase, (D) serine palmitoyl transferase, (E) Stearoyl-CoA desaturase.
27. Many proteins undergo chemical modification of amino acid residues. Which of the following modification(s) may play important role in controlling the life span of proteins within cells? (A) 3-Methylhistidine, (B) 3-Hydroxyproline, (C) γ-carboxyglutamate, (D) acetyllisine, (E) acetylated N-terminus.
28. Which of the following enzymes/molecular machines is/are activated when recombinant proteins are over-expressed in the cells? (A) Spliceosome, (B) Proteasome, (C) Peptidyl-prolyl isomerase, (D) Nuclear pore complex, (E) Protein disulfide isomerase.
29. A single polypeptide may exhibit multiple types of secondary structure depending on its sequence. Which of the following statements is/are true? (A) The α-helix is exposed to the surface of a protein, (B) The β-sheet is exposed to the surface of a protein, (C) Turns allow large proteins to fold into highly compact structures, (D) Loops allow large proteins to fold into highly compact structures, (E) none of these.
30. Membrane lipids are usually distributed unequally in the exoplasmic and cytosolic leaflets. How the asymmetric distribution of phospholipids in membrane leaflets arises is still unclear. (A) Lipid binding proteins are likely involved in this process, (B) phospholipase A1 or A2 is likely involved, (C) phospholipase C is likely involved, (D) phospholipase D is likely involved, (E) none of these proteins is likely involved.
31. The life-span of a model organism (e.g., yeast or C. elegans) or mouse may be extended by feeding (A) high protein diet, (B) diet supplemented with various vitamins, (C) high carbohydrate diet, (D) low calorie diet, (E) high fat diet.
32. Organic compounds are usually oxidized in which organelles without the production of ATP: (A) lysosomes, (B) mitochondria, (C) endoplasmic reticulum, (D) endosomes, (E) peroxisomes.
33. Phospholipids are synthesized in (A) Golgi apparatus, (B) smooth endoplasmic reticulum, (C) rough endoplasmic reticulum, (D) plasma membrane, (E) nuclear membrane.
34. The half-life of a protein is governed by (A) its secondary structure, (B) its post-translational modifications, (C) its interaction with other proteins, (D) its functional activities, (E) its subcellular localizations.

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35. Hybridomas produce monoclonal antibodies (mAbs). Which of the following statements is/are true? (A) The specificities of mAbs are better than polyclonal antibodies, (B) mAbs are exclusively IgG class, (C) mAbs are better for immunoprecipitation of antigens, (D) mAbs are better for immunofluorescent staining, (E) none of these is true.
36. Which of the following statements is/are false? (A) The most energy consuming cellular process is solute transport, (B) The most energy consuming cellular process is translation, (C) The most energy generation organelle is mitochondria, (D) The most energy consuming process is transcription. (E) none of these.
37. Which of the following receptors is/are not belonging to G protein-coupled receptors (GPCRs)? (A) thrombin, (B) odorant, (C) prostaglandin, (D) rhodopsin, (E) insulin.
38. Which of the following functional groups or enzymes is/are not involved in oxidation/reduction reactions? (A) peptidyl-prolyl isomerase, (B) protein disulfide isomerase, (C) selenocysteine residue, (D) iron-sulfur center of certain enzymes , (E) none of these.
39. Which of the following statements is/are true? (A) Proteins with KDEL signal are nuclear membrane-resident, (B) Proteins with KKXX signal are ER-resident, (C) Proteins with mannose 6-phosphate signal are plasma membrane-resident, (D) Proteins with NPXY are nuclear membrane-resident, (E) none of these.
40. Stem cells play important roles in which of the following tissues/organs? (A) lung, (B) liver, (C) skin, (D) intestine, (E) brain.

試題隨卷繳回