



Dr.G.R.Damodaran College of Science

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III BSC [2015 - 2018]

SEMESTER V

ELECTIVE I: MEDICAL BIOTECHNOLOGY - 509U1

Multiple Choice Questions.

1. The advantages of the structure based drug design include _____.

- A. Faster.
- B. Less expensive.
- C. More specific.
- D. All the above.

ANSWER: D

2. Example of red biotechnology is _____

- A. Antibodies
- B. Pesticides
- C. Industrial catalysts
- D. Bt corn

ANSWER: B

3. Application of biotechnology procedures in medical processes is classified as _____

- A. white biotechnology
- B. Red Biotechnology
- C. Blue Biotechnology
- D. Green Biotechnology

ANSWER: B

4. First use of biotechnology to convert food source into other form was made by _____

- A. Alexander Fleming
- B. Louis Pasteur
- C. Charles Darwin
- D. Chaim Weizmann

ANSWER: B

5. The diagnosis of a disease is usually made by _____.

- A. Recognizable signs and symptoms.
- B. Clinical history.
- C. Examination.
- D. All the above.

ANSWER: D

6. _____ vaccines are components of the pathogenic organisms.

- A. Subunit.
- B. Attenuated.
- C. Vector.
- D. Viral.

ANSWER: A

7. Which of the following terms best describes a test used detect disease before it presents clinically?

- A. Diagnostic test.

- B. Sensitive test.
- C. Screening test.
- D. Prognostic test.

ANSWER: C

8. When a drug delivery system releases the drug only in a specific organ it is called as _____.
- A. First order targeting.
 - B. Second order targeting.
 - C. Third order targeting.
 - D. Higher level targeting.

ANSWER: A

9. The second order targeting is otherwise called as _____.
- A. Organ targeting.
 - B. Cellular targeting.
 - C. Sub-cellular targeting.
 - D. Organelle targeting.

ANSWER: B

10. Which of the following is used as ligands in the active targeting?
- A. Selectins.
 - B. Integrins.
 - C. Vitamins.
 - D. All the above.

ANSWER: D

11. Genetic testing identifies changes in _____.
- A. Genes
 - B. Proteins
 - C. Chromosomes
 - D. All of above

ANSWER: D

12. _____ therapy was tried for the treatment of brain tumor.
- A. Antisense therapy.
 - B. Nucleic acid therapy.
 - C. Somatic therapy.
 - D. Germline therapy.

ANSWER: A

13. _____ is a glycoprotein present in the envelope of HIV.
- A. gp 120.
 - B. gp 125.
 - C. gp 130.
 - D. gp110.

ANSWER: A

14. The diagnosis of disease is important to _____.
- A. Give appropriate treatment.
 - B. Prevent the disease progression.
 - C. Alleviate the disease at the earliest.
 - D. All the above.

ANSWER: D

15. Antisense therapy refers to the inhibition of _____.
- A. Transcription.
 - B. Replication.
 - C. Recombination.

D. Translation.

ANSWER: D

16. The common diagnostic service include _____.

- A. Physiological function test.
- B. Pathology laboratory investigation.
- C. Radiographic examination.
- D. All the above.

ANSWER: D

17. _____ recombinant vaccines are genetically modified pathogenic organisms.

- A. Attenuated.
- B. Subunit.
- C. Vector.
- D. Viral.

ANSWER: B

18. Lymphocytes are activated by _____ antigen.

- A. Blood stream.
- B. Bone marrow.
- C. Liver.
- D. Lymph nodes.

ANSWER: D

19. In genetic engineering, a chimera is _____

- A. An enzyme that links DNA molecules
- B. A 5plasmid that contains foreign DNA
- C. A virus that infects bacteria
- D. A fungi

ANSWER: B

20. Vaccination protects us from infectious disease by generating memory _____.

- A. Antigen.
- B. Lymphocytes.
- C. Macrophages.
- D. PMNs.

ANSWER: B

21. A booster vaccine is called a(n) _____ response.

- A. Primary response.
- B. Innate response.
- C. Humoral response
- D. Secondary response.

ANSWER: D

22. Stem cells can produce which of the following cell types?

- A. Placental.
- B. Neuronal.
- C. Red blood cells.
- D. Both B and C.

ANSWER: D

23. Human embryonic stem cells are derived from _____.

- A. Morula.
- B. Egg.
- C. Inner cell mass.
- D. Trophoblast.

ANSWER: C

24. The signalling molecules that travel long distance are _____.

- A. Endocrine.
- B. Paracrine.
- C. Autocrine.
- D. Neurotransmitter.

ANSWER: A

25. Which of the following is NOT a clotting factor?

- A. Factor-I.
- B. Factor- XIII.
- C. Factor- VI.
- D. Factor- IX.

ANSWER: C

26. Cytokine family includes _____.

- A. Interleukins.
- B. Interferon.
- C. Tumor Necrosis factor.
- D. All the above.

ANSWER: D

27. The term bioinformatics was coined by _____

- A. J.D Watson
- B. Margart Dayhoff
- C. Pauline Hogeweg
- D. Frederic Sanger

ANSWER: C

28. The disease hemophilia B is caused due to the deficiency of blood clotting factor _____.

- A. VIII.
- B. IX.
- C. III.
- D. X.

ANSWER: B

29. The soft clot is stabilized by the blood clotting factor _____.

- A. XIIIa.
- B. IXa.
- C. VIIa.
- D. X.

ANSWER: A

30. The recombinant form of blood clotting factor VIIa is called _____.

- A. Novoseven.
- B. Nanoseven.
- C. Proconvertin.
- D. Microseven.

ANSWER: A

31. The human genome project began as researchers mapped _____ and sites of cytogenetic abnormalities.

- A. lods
- B. RFLPs
- C. PCRs
- D. VNTRs

ANSWER: B

32. The function of plasmin is to _____.

- A. Degrade fibrin.
- B. Form fibrin from fibrinogen.
- C. Form fibrin polymer.
- D. Degrade fibrinogen.

ANSWER: A

33. The tissue plasminogen activator is the activator of _____.

- A. Fibrinogen.
- B. Plasminogen.
- C. Kallikrein.
- D. Fibrin polymer.

ANSWER: B

34. The tPA is otherwise called as _____.

- A. Fibrinokinase.
- B. Plasminokinase.
- C. Fibrinolyase.
- D. Plasminolyase.

ANSWER: A

35. The trade name of recombinant tissue plasminogen activator is _____.

- A. Alteplase.
- B. Streptokinase.
- C. Urokinase.
- D. Staphylokinase.

ANSWER: A

36. The interferons have _____ activity.

- A. Anti-bacterial.
- B. Anti-fungal.
- C. Anti-viral.
- D. Anti-tumor.

ANSWER: C

37. The different types of interferons include _____.

- A. IFN-gamma.
- B. IFN-beta.
- C. IFN-alpha.
- D. All the above.

ANSWER: D

38. The IFN-gamma is otherwise called as _____.

- A. Leukocyte IFN.
- B. Immune IFN.
- C. Fibroblast IFN.
- D. Lymphocyte IFN.

ANSWER: B

39. Production of interferons occurs mainly in response to microbes, such as _____.

- A. viruses and bacteria, and their products.
- B. viruses and fungi, and their products.
- C. viruses and algae, and their products.
- D. fungi and algae, and their products.

ANSWER: A

40. The recombinant product of IFN is _____.

- A. Roferon A.
- B. Intron A.

- C. Alferon.
- D. All the above.

ANSWER: D

41. The recombinant IFN-beta is used in the treatment of_____.

- A. Multiple sclerosis.
- B. Hepatitis-B.
- C. Hepatitis-C.
- D. All the above.

ANSWER: D

42. The IFN-gamma is predominantly produced by_____.

- A. lymphocytes.
- B. mcells.
- C. dendrites cells.
- D. eosinophils.

ANSWER: A

43. The IFN can be produced in_____.

- A. Use of cell line.
- B. Microbial system.
- C. Mammalian system.
- D. All the above.

ANSWER: D

44. A compound that has desirable properties to become a drug is called_____

- A. Lead
- B. Find
- C. Fit
- D. Fit compound

ANSWER: A

45. All known interleukins are glycosylated EXCEPT_____.

- A. IL-6.
- B. IL-12.
- C. IL-1.
- D. IL-4.

ANSWER: C

46. Which of the following is a cytokine that acts mainly to activate B-cells to proliferate?

- A. Interleukin 1.
- B. Interleukin 2.
- C. Interleukin 4.
- D. Interleukin 10.

ANSWER: C

47. IL-2 is mainly produced by_____.

- A. B-lymphocytes.
- B. T-lymphocytes.
- C. dendritic cells.
- D. basophils.

ANSWER: B

48. IL-1 is otherwise known as_____.

- A. lymphocyte activating factor.
- B. catabolin.
- C. endogeneous pyrogen
- D. all the above.

ANSWER: D

49. Difficulties are encountered in safe gene therapy development which one of the following is most important?

- A. The need to develop methods to limit gene expression only in target tissue
- B. The need to develop methods to deliver the vector to the target cell
- C. The need to accurately control gene expression
- D. The need to develop methods to avoid immune reactions to the vector and gene expression product

ANSWER: D

50. _____ is used to treat anaemia in human beings.

- A. Antitrypsin.
- B. Glucagon.
- C. Calcitonin.
- D. Erythropoietin.

ANSWER: D

51. Erythropoietin stimulates erythropoiesis by _____.

- A. increasing the rate of hemoglobin synthesis.
- B. accelerating the rate of erythrocyte precursor differentiation.
- C. increasing the number of committed cells differentiating into erythrocytes.
- D. all the above.

ANSWER: D

52. The half life of erythrocytes is _____ days.

- A. 120 .
- B. 40 .
- C. 60 .
- D. 150 .

ANSWER: A

53. The hormone erythropoietin is produced by _____.

- A. kidneys.
- B. liver.
- C. heart.
- D. bone marrow.

ANSWER: A

54. Erythropoietin is used _____.

- A. in the treatment of anemia.
- B. in the treatment of myocardial infarction.
- C. to reduce the transfusion requirement after the surgery.
- D. all the above.

ANSWER: D

55. The virus used as vector in gene therapy include _____.

- A. oncoretrovirus.
- B. adenovirus.
- C. herpes virus.
- D. all the above.

ANSWER: D

56. What is a gene?

- A. A unit of heredity on a chromosome.
- B. A protein on the surface of a cell.
- C. A variation of a unit of heredity on a chromosome.
- D. The first generation of offspring.

ANSWER: A

57. The success on in vivo gene therapy depends on _____.
- A. efficiency of the uptake of the therapeutic gene by the target cell.
 - B. expression capability of the gene.
 - C. intracellular degradation of the gene and its uptake by nucleus.
 - D. all the above.

ANSWER: D

58. A nasal spray containing adenovirus carrying a functional human CFTR gene is used to treat cystic fibrosis is an example of which type of gene therapy?
- A. In situ.
 - B. In vivo.
 - C. Ex vivo.
 - D. Vaccine
- ANSWER: B

59. Which of the following is the genetic material?
- A. DNA.
 - B. RNA.
 - C. Protein.
 - D. It has not been identified.
- ANSWER: A

60. Which process is used to insert normal genes into human cells to correct disorders?
- A. Gene therapy.
 - B. Live vector vaccines.
 - C. Molecular cloning.
 - D. Stem cell therapy.
- ANSWER: A

61. Gene therapy _____.
- A. cannot be used to correct genetic disorders.
 - B. has proven to be beneficial to HIV patients.
 - C. involves replacement of a defective allele in sex cells.
 - D. has its greatest chance of success with bone marrow cells.
- ANSWER: D

62. Which cell type would not be a direct target for gene therapy?
- A. Red blood.
 - B. Muscle.
 - C. Liver.
 - D. Endothelium.
- ANSWER: A

63. Gene therapy targets _____.
- A. genotypes.
 - B. phenotypes.
 - C. either A (or) B depending on the application.
 - D. both genotypes and phenotypes.
- ANSWER: A

64. Which vector used in gene therapy infects nerve cells and can be used to treat brain tumors?
- A. Adeno-associated virus.
 - B. Adenovirus.
 - C. Herpes virus.
 - D. Retrovirus.
- ANSWER: C

65. Which vector used in gene therapy has proved useful in the treatment of sickle cell disease?

- A. Adeno-associated virus.
- B. Adenovirus.
- C. Herpes virus.
- D. Retrovirus.

ANSWER: A

66. Gene therapy would have to "fix" _____ % of the cells in the liver to be effective.

- A. 1.
- B. 5.
- C. 10.
- D. 50.

ANSWER: B

67. The first gene therapy used cells altered outside the recipient's body and is called _____ gene therapy.

- A. in situ.
- B. in vivo.
- C. ex vivo.
- D. vaccine.

ANSWER: C

68. Neurons are difficult targets for gene therapy, because they (are) _____.

- A. not easily accessible.
- B. small.
- C. do not divide.
- D. lacks nucleus.

ANSWER: C

69. ----- is the therapeutic delivery of nucleic acid polymers into a patient's cells as a drug to treat disease.

- A. Stem cell therapy.
- B. Gene therapy.
- C. Synthetic therapy.
- D. All the above.

ANSWER: B

70. Most current gene therapy trials mainly targets on_____.

- A. cancer.
- B. HIV.
- C. cystic fibrosis.
- D. A & B.

ANSWER: D

71. Which of the following is an example of a condition caused by a mutation in a single gene?

- A. Colon cancer.
- B. Heart disease.
- C. AIDS.
- D. Cystic fibrosis.

ANSWER: D

72. When was the first gene therapy patient treated?

- A. 1988.
- B. 1990.
- C. 1993.
- D. 1999.

ANSWER: B

73. Gene therapy is used to treat_____.

- A. cancer.
- B. ADA deficiency.
- C. cystic fibrosis.
- D. Cystic fibrosis.

ANSWER: D

74. Somatic gene therapy involves the usage of _____.

- A. sperm cell.
- B. egg cell.
- C. body cell.
- D. germ cell.

ANSWER: C

75. Germ cell therapy involves the usage of _____.

- A. egg.
- B. liver cell.
- C. kidney cell.
- D. fibroblast.

ANSWER: A

76. How do genetic diseases differ from other diseases?

- A. Recurrence risk is predictable.
- B. Pre-symptomatic testing is possible.
- C. Different populations have different characteristic frequencies.
- D. All of the above.

ANSWER: D

77. The most frequent type of drug-food interaction is food _____

- A. Causing increased therapeutic drug levels
- B. Affecting the metabolism of the drug
- C. Altering the volume of distribution of drugs
- D. Affecting the gastrointestinal absorption of drugs

ANSWER: D

78. Which of the following is not true regarding adeno-associated virus?

- A. It contains double-stranded DNA.
- B. It may integrate into the host chromosome.
- C. It may exist in the cell as an episome.
- D. associated with insertional mutagenesis when used as a gene therapy vector.

ANSWER: A

79. In gene therapy, in order to be successful, the healthy gene inserted into a target cell must _____.

- A. take over and kill the defective gene.
- B. be inserted manually into the cell's mitochondria.
- C. become attached to the cell's mRNA molecules.
- D. be able to make the correct amount of the protein needed.

ANSWER: D

80. Gene therapy targeting the germ-line is _____.

- A. heritable.
- B. non-heritable.
- C. sometimes heritable.
- D. unrelated to heritability.

ANSWER: A

81. Which of the following statements regarding retroviruses is/are correct?

- A. The genetic material contained within a retrovirus is DNA.
- B. Inside the host cell the viral RNA is converted to single-stranded DNA.

- C. Proviral DNA is integrated into the host chromosome.
- D. Retroviruses can be used to transfect both replicating and non-replicating cells.

ANSWER: C

82. The first transgenic plant was _____.

- A. Tobacco.
- B. Peas.
- C. Cotton.
- D. flax.

ANSWER: A

83. The transgene are introduced into an animal using _____.

- A. Retroviral vector.
- B. microinjection method.
- C. embryonic stem cell method.
- D. all the above.

ANSWER: D

84. The marker commonly used for the selection of the transgene is/are _____.

- A. dihydrofolate reductase.
- B. Neomycin phosphotransferase.
- C. thymidine kinase.
- D. All the above.

ANSWER: D

85. Identify the term used for the study of drugs and their effect on the body :

- A. Pharmacy
- B. Pharmaceutical
- C. Pharmacology
- D. Physiotherapy

ANSWER: C

86. Which of the following viral vectors are most often used in clinical gene therapy trials?

- A. Lentiviral vectors.
- B. Vaccinia vectors.
- C. Adeno-associated viral vectors.
- D. Adenoviral vectors

ANSWER: D

87. In the antisense technology DNA produced from mRNA _____.

- A. reverse transcriptase enzyme.
- B. viral protein.
- C. envelope protein.
- D. polymerase enzyme.

ANSWER: A

88. Which of the following can carry a large amount foreign DNA with them?

- A. Retrovirus.
- B. Adenovirus.
- C. Adeno-associated virus.
- D. Herpes simplex virus.

ANSWER: B

89. The types of gene therapy include _____.

- A. in vitro.
- B. in situ.
- C. ex vivo.
- D. all the above.

ANSWER: D

90. Which of the following represent obstacles to the use of retroviruses in therapeutic gene transfer?

- A. Viral receptors may not be present on target cell membranes.
- B. For integration, the host cell must undergo mitosis.
- C. Viral purification is difficult.
- D. All the above.

ANSWER: D

91. The retroviral vector can effectively carry the genes up to _____ kb.

- A. 12.
- B. 8.
- C. 20.
- D. 35.

ANSWER: B

92. Getting a new drug into the market on an average takes _____

- A. About 8-10 months and lakhs of rupees
- B. About 2-3 years and crores of rupees
- C. About 10-15 years and thousands of crores of rupees
- D. None of the above

ANSWER: C

93. The problem with the use of modified live vaccines is _____.

- A. Toxicity.
- B. Residual virulence.
- C. Encephalitis.
- D. Muscle pain.

ANSWER: B

94. HIV/AIDS is _____.

- A. one of the greatest challenges facing the world in the 21st century.
- B. an emergency of an unprecedented nature.
- C. such a global disaster and threat to the world population.
- D. all the above.

ANSWER: D

95. HIV/AIDS is transmitted through _____.

- A. semen, and breast milk.
- B. vaginal secretions.
- C. blood.
- D. All the above.

ANSWER: D

96. The drug that is used to treat AIDS patients is

- A. azidothymidine.
- B. tetracycline.
- C. cortisone.
- D. cyclosporine.

ANSWER: A

97. Production of vaccine against AIDS difficult because the HIV virus _____.

- A. is drug resistant.
- B. has a reverse transcriptase.
- C. shows antigenic variation.
- D. All the above.

ANSWER: D

98. On what basis is a food classified as a functional food or nutraceutical?

- A. Must provide health benefits beyond basic nutrition
- B. Must be low-calorie
- C. Must be low-fat
- D. Must be able to be manufactured into a dietary supplement product

ANSWER: A

99. Cancer is caused due to _____.

- A. hereditary.
- B. mutation.
- C. virus.
- D. all the above.

ANSWER: D

100. Which is considered the "gold standard" of existing vaccines?

- A. Purified proteins.
- B. Whole-organism.
- C. DNA-based.
- D. Inactivated exotoxins.

ANSWER: B

101. Which among the following organism is suitable for recombinant vaccine production?

- A. Influenza virus.
- B. Poliovirus.
- C. Smallpox.
- D. Vaccinia virus.

ANSWER: D

102. Nutraceutical products are _____.

- A. dietary supplement.
- B. health giving supplement.
- C. prevent disease.
- D. all the above.

ANSWER: D

103. The host cell used for the production of erythropoietin is _____.

- A. E. coli.
- B. Yeast.
- C. CHO cell lines.
- D. BHK cell lines.

ANSWER: C

104. The recombinant product of EPO is _____.

- A. Epogen.
- B. Protropin.
- C. Igef.
- D. Serostim.

ANSWER: A

105. The recombinant product used for the treatment of thrombocytopenia is _____.

- A. Neumaga.
- B. Wellferon.
- C. Betaferon.
- D. Intron

ANSWER: A

106. IFNs produced using CHO cell lines include _____.

- A. Betaferon.

- B. Avonex.
 - C. Betaseron.
 - D. Epogen.
- ANSWER: B

107. The strategies to target the tumor is based on _____.

- A. cell.
- B. gene.
- C. immune therapy methods.
- D. all the above.

ANSWER: D

108. The gene delivery is a challenging task in the treatment of _____.

- A. bacterial infection.
- B. genetic disorder.
- C. viral infection.
- D. auto-immune disorders.

ANSWER: B

109. Which of the following targeting methods are used to treat cancer?

- A. Active targeting.
- B. Passive targeting.
- C. Physical targeting.
- D. Inverse targeting.

ANSWER: A

110. The concept of vaccination was first developed by _____

- A. Louis Pasteur
- B. Edward Jenner
- C. Carl Landsteiner
- D. Joseph Miester

ANSWER: B

111. Cancer is often the result of activation of ____ to ____ and the inactivation of ____ genes.

- A. oncogenes, tumor-suppressor genes, proto-oncogenes.
- B. proto-oncogenes, oncogenes, tumor-suppressor genes.
- C. oncogenes, proto-oncogenes, tumor-suppressor genes.
- D. proto-suppressor genes, suppressors, oncogenes.

ANSWER: B

112. About 50% of all human cancers may involve an abnormal or missing _____.

- A. oncogene.
- B. proto-oncogene.
- C. p53 gene.
- D. BRCA-1 gene.

ANSWER: C

113. A Vaccine can be _____

- A. An vaccine protein
- B. Weakened protein
- C. Live attenuated pathogen
- D. All of these

ANSWER: D

114. Which type of cancer in humans is directly caused by a viral infection?

- A. acute T cell leukemia.
- B. Wilms' tumor.
- C. Rous sarcoma.

D. Burkitt's lymphoma.

ANSWER: A

115. An oncogene transcribed and translated with another gene produces a _____.

- A. transcribed protein
- B. fusion protein.
- C. fusion cell.
- D. cancer protein.

ANSWER: C

116. The p53 protein normally promotes _____.

- A. DNA repair.
- B. tumor formation.
- C. cell division.
- D. apoptosis.

ANSWER: D

117. The p53 gene is especially prone to _____.

- A. point mutation.
- B. chromosomal rearrangement.
- C. loss.
- D. gene addition.

ANSWER: A

118. Which of the following cancers develops from loss of tumor suppression?

- A. Acute T cell leukemia.
- B. Wilms' tumor.
- C. Burkitt's lymphoma.
- D. Rous sarcoma.

ANSWER: B

119. Which of the following is not a traditional cancer treatment?

- A. Blocking telomerase.
- B. Inhibiting angiogenesis.
- C. Stimulating specialization.
- D. None of the above.

ANSWER: D

120. The name Kary Mullis is associated with _____.

- A. Gel retardation assay
- B. Chain termination reaction
- C. RFLP
- D. PCR

ANSWER: D

121. Which of the following may contribute to causing cancer?

- A. A mutation in a gene that slows the cell cycle.
- B. Faulty DNA repair.
- C. Loss of control over telomere length.
- D. All the above.

ANSWER: D

122. AIDS virus has _____.

- A. single strand DNA.
- B. double strand DNA.
- C. single strand RNA.
- D. double strand RNA.

ANSWER: C

123. AIDS is due to _____.
- A. reduction in number of helper T-cell.
 - B. reduction in number of killer T-cell.
 - C. auto-immunity.
 - D. non-production of interferons.

ANSWER: A

124. For allogenic hemopoietic stem cell transplantation in children with hemoglobinopathies, the best source of stem cells is _____.
- A. bone marrow.
 - B. umbilical cord.
 - C. peripheral blood.
 - D. bone marrow + peripheral blood.

ANSWER: A

125. What makes stem cells different from other cells in the body?
- A. Stem cells are larger in size.
 - B. Stem cells are unspecialized cells.
 - C. Stem cells have unique morphology.
 - D. Stem cells are thick.

ANSWER: B

126. When unspecialized stem cells give rise to specialized cells, what is this process called?
- A. differentiation.
 - B. de-differentiation.
 - C. elongation.
 - D. speciation.

ANSWER: A

127. Plasticity of stem cell is the property in which the _____.
- A. cells become thick and hard over the time.
 - B. cells remain quiescent.
 - C. cells from one area would become cells related to a different area.
 - D. cells acquire elasticity.

ANSWER: C

128. Cell based therapies using stem cells helps in _____.
- A. replacement of tissue and organs.
 - B. understanding signals that causes cell differentiation.
 - C. understanding growth of the cell.
 - D. medication of viral infection.

ANSWER: A

129. The process by which developing cells achieve their functional, mature identity as liver, or muscle, or nerve is called _____.
- A. cleavage division.
 - B. pattern formation.
 - C. morphogenesis.
 - D. differentiation.

ANSWER: D

130. Stem cells can be isolated from _____.
- A. embryo.
 - B. umbilical cord.
 - C. bone marrow.
 - D. all the above.

ANSWER: D

131. Embryonic stem cells are pluripotent which means that it _____.

- A. can be differentiated into any cell type.
- B. can give rise to placenta.
- C. can give rise to extra embryonic tissue.
- D. can give rise to the whole organism.

ANSWER: A

132. Stem cell can _____.

- A. self renew.
- B. give rise to any cell type.
- C. both a and b.
- D. cannot divide.

ANSWER: C

133. PCR was invented by _____.

- A. Bordet.
- B. Milsten.
- C. Cohen Beyer.
- D. Kary Mullis.

ANSWER: D

134. How many phases of clinical trials exist to approve a drug?

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

ANSWER: D

135. The source of active principle in drug discovery include _____.

- A. plant source.
- B. aquatic source.
- C. microbe source.
- D. all the above.

ANSWER: D

136. The successful source of lead (drug) is _____.

- A. natural products.
- B. synthetic oligonucleotides.
- C. readymade products.
- D. synthetic peptides.

ANSWER: A

137. The anti cancer agent include _____.

- A. taxol.
- B. docetaxel.
- C. camptothecin.
- D. all the above.

ANSWER: D

138. Funding for the Human Genome Project comes from

- A. The NIH.
- B. The DOE.
- C. The NIH and the DOE.
- D. The NIH, the DOE and ELSI.

ANSWER: C

139. The _____ can be used to design and synthesize compound that act as novel antibiotics.

- A. peptides.
- B. carbohydrates.
- C. lipids.
- D. nucleic acids.

ANSWER: A

140. The nuclear hormone receptors are the potential targets for_____.

- A. cancer.
- B. diabetes.
- C. neurological disorders.
- D. all the above.

ANSWER: D

141. The nitroimidazopyran is a potential therapeutic agent against_____.

- A. tuberculosis.
- B. leprosy.
- C. typhoid.
- D. malaria.

ANSWER: A

142. The hormone insulin helps in the regulation of_____.

- A. blood sugar.
- B. blood glucose.
- C. urine glucose.
- D. urine sugar.

ANSWER: B

143. The clinical trials are conducted to_____.

- A. establish the awareness of the drug in the market.
- B. evaluate the efficacy and safety of the drug before commercialization.
- C. check whether the drug can be sold effectively.
- D. advertise the drug to the people.

ANSWER: B

144. What are the steps taken during the clinical trials?

- A. Checking the health and giving specific instruction to the participant.
- B. Observe the various parameters of the study in the participated as indicated in the protocol.
- C. Continue to stay with the participant even after the trial is completed.
- D. All the above.

ANSWER: D

145. Which criteria allow someone to participate in the clinical trials?

- A. Exclusion criteria.
- B. Inclusion criteria.
- C. Intrusion criteria.
- D. Invasion criteria.

ANSWER: B

146. The different types of clinical trials include_____.

- A. treatment trial.
- B. prevention trial.
- C. symptoms trial.
- D. a & b.

ANSWER: D

147. In phase I trial, the drug is tested on_____volunteers.

- A. 2 to 8.
- B. 20 to 80.

- C. 200 to 800.
- D. 2000 to 8000.

ANSWER: B

148. In phase II trial, the drug is tested on _____ volunteers.

- A. 50 to 100.
- B. 300 to 600.
- C. 600 to 1000.
- D. 900 to 1100.

ANSWER: A

149. Randomization is done in _____.

- A. Phase I trial.
- B. Phase II trial.
- C. Phase III trial.
- D. Phase IV trial.

ANSWER: C

150. Phase IV trials are conducted _____.

- A. on group of specified patients.
- B. to evaluate the long term safety.
- C. to check only the safety and not side effects.
- D. to check only the efficacy and not safety.

ANSWER: B

151. Phase II trial is otherwise called as _____.

- A. clinical pharmacological evaluation.
- B. controlled clinical evaluation.
- C. extended clinical evaluation.
- D. post marketing surveillance.

ANSWER: B

152. Malaria is caused by a _____.

- A. protozoan.
- B. fungi.
- C. virus.
- D. bacteria.

ANSWER: A

153. A preservative acts as an antioxidant and can prevent _____.

- A. formation of acidity .
- B. physical change.
- C. oxidation of fats.
- D. microbial attack.

ANSWER: C

154. The new technology of food preservation where shelf life is increased 2 to 3 folds is _____.

- A. UV radiation.
- B. HELP.
- C. ionizing radiation.
- D. transgenesis.

ANSWER: C

155. The new method of food processing where by gene alteration can improve the product; such foods are referred as _____.

- A. transgenic food.
- B. nutraceuticals.
- C. genetically modified food.

D. all the above.

ANSWER: D

156. The conversion of sugar into carbon dioxide in the absence of oxygen is known as _

- A. dehydration .
- B. hydrolysis.
- C. fermentation.
- D. hydration.

ANSWER: C

157. Nutraceuticals having their origin from plants are known as _____.

- A. photoceutical.
- B. phytochemicals.
- C. phytofoods.
- D. functional foods.

ANSWER: B

158. Which of the following explains stages of cancer?

- A. A genetic defect or carcinogen leads to a mutation in the DNA, which leads to cancer.
- B. A mutation in the genetic code causes carcinogens in the chromosomes, which leads to cancer.
- C. Cancer, inherited or developed by contact with toxins, causes mutation in the chromosomes, which leads to a carcinogen.
- D. A mutation in the genetic code results in the carcinogen hormone being secreted to certain cells that develop into a cancerous tumour.

ANSWER: A

159. Cytokines may exhibit _____ action, signaling the cells that produce them.

- A. paracrine.
- B. autocrine.
- C. endocrine.
- D. All the above.

ANSWER: D

160. Cytokines are NOT _____.

- A. antigen specific.
- B. capable of activating more than one cell type.
- C. made by lymphocytes.
- D. small protein molecules.

ANSWER: A

161. Several cytokines may have the same effect on the cells they bind. This is an example of _____.

- A. a cascade.
- B. antagonism.
- C. pleiotropism.
- D. redundancy.

ANSWER: D

162. Expansion of CHO is _____.

- A. Chick Hamster Ovary.
- B. Chinese Hamster Ovary.
- C. Chinese Hamster Ovum.
- D. Chinese Hen Ovary.

ANSWER: B

163. Serum is made up of _____.

- A. hormones.
- B. growth factors.
- C. nutrients.

D. All the above.

ANSWER: D

164. Which of the following method is used to introduce a foreign gene?

- A. Retroviral vector method.
- B. Microinjection method.
- C. Embryonic stem cell method.
- D. All the above.

ANSWER: D

165. Embryonic stem cells are collected at _____.

- A. blastocyst stage.
- B. gastrula stage.
- C. both a and b.
- D. none of the above.

ANSWER: A

166. _____ problem is associated with peptide based drugs.

- A. Bioavailability.
- B. Chemicals.
- C. Reagents.
- D. DNA.

ANSWER: A

167. Proteome mining helps in _____ study.

- A. drug discovery.
- B. drug delivery.
- C. proteolysis.
- D. drug target.

ANSWER: B

168. Recently _____ are used as a pro-biotic as it has beneficial bacteria.

- A. milk.
- B. curd.
- C. cheese.
- D. paneer.

ANSWER: B

169. The precursor used for tissue engineering of bones _____.

- A. hypertrophic cartilage.
- B. kidney cells.
- C. heart cells.
- D. liver cells.

ANSWER: A

170. Example of green biotechnology is

- A. Industrial Antibiotics
- B. Industrial chemicals
- C. Industrial catalysts
- D. BT corn and Pesticides

ANSWER: D

171. Immunoglobins _____.

- A. are antibodies.
- B. are classified into five major classes, i.e., IgM, IgG, IgA, IgD, IgE.
- C. have a molecular specificity to recognize unique epitope.
- D. all the above.

ANSWER: D

172. Triple antigen (D.P.T) is for _____.
- A. Tetanus, pertussis and diphtheria.
 - B. Polio, rabies and hepatitis.
 - C. Malaria, typhoid and cancer.
 - D. Mixture of virus of tetanus, diphtheria and whooping cough.

ANSWER: A

173. Which one of the following comes under cytokines family?
- A. Membrane factor.
 - B. Tumor necrosis factor.
 - C. Interferons.
 - D. both b & c.

ANSWER: D

174. A chiral molecule is _____.
- A. a non-superimposable mirror image.
 - B. a superimposable mirror image.
 - C. not a drug molecule.
 - D. not an enantiomers.

ANSWER: A

175. The two mirror images of a chiral molecule are called _____.
- A. enantiomers.
 - B. optical isomers.
 - C. both a & b.
 - D. not an enantiomers.

ANSWER: C

176. The process of finding a new drug against a chosen target for a particular disease usually involves _____.
- A. non - high-throughput screening (NHTS).
 - B. high-throughput screening (HTS).
 - C. high-throughout screening (HTS).
 - D. high-throughput searching (HTS).

ANSWER: B

177. FDA is _____.
- A. Food and Drug Adulteration.
 - B. Food and Drug Administration.
 - C. Food and Drug Alteration
 - D. Food and Drug Advice.

ANSWER: B

178. What is a genetically modified food product?
- A. Genetic characteristics altered food.
 - B. Unwanted genetic altered food.
 - C. Non genetic altered food
 - D. Pathogenic altered food.

ANSWER: A

179. Drug regulatory requirements are part of the process of _____.
- A. drug discovery.
 - B. drug development.
 - C. both a & b.
 - D. drug alteration.

ANSWER: C

180. Research experimental studies and surveillance activities undertaken after a drug is approved for marketing is called _____.

- A. Post approval Clinical trials.
- B. Clinical trials I.
- C. Clinical trials II.
- D. Clinical trials III.

ANSWER: A

181. The drug discovery and development process is assembled in _____.

- A. new Drug Application.
- B. novel Drug Application
- C. non Drug Application.
- D. none of the above.

ANSWER: A

182. License granted for products that meet standards designed to _____.

- A. safety.
- B. purity.
- C. potency.
- D. All the above.

ANSWER: D

183. Types and Features of Combinatorial Libraries:

- A. Random libraries: Drug like diverse scaffolds.
- B. Focused libraries: similar to lead complete.
- C. Targeted libraries: target-directed diverse substitution.
- D. All the above.

ANSWER: D

184. The process of finding a new drug involves _____.

- A. screening.
- B. design.
- C. both a & b.
- D. non screening.

ANSWER: C

185. Which of the following is related to genetic Engineering

- A. Plastid
- B. Plasmid
- C. Heterosis
- D. Mutation

ANSWER: B

186. A food stuff (as a fortified food or a dietary supplement) that provides health benefits is _____.

- A. Nutraceutical.
- B. Natural food.
- C. Artificial food.
- D. Non dietary food.

ANSWER: A

187. Designed clinical trail guideline is _____.

- A. ILCR.
- B. ICMR.
- C. IMCR.
- D. IMRC.

ANSWER: B

188. Abbreviation for ICMR is _____.

- A. Indian Country of Medical Rearangments.
- B. Indian Council of Methodogical Research.
- C. Indian Council of Medical Rearangments.
- D. Indian Council of Medical Research.

ANSWER: D

189. AIDS is _____

- A. Endemic
- B. Epidemic
- C. Pandemic
- D. Sporadic

ANSWER: C

190. The aims of CLINICAL TRIAL INSPECTION PROGRAMME include_____.

- A. verification of GCP compliance to protect the rights, safety and well being of the subjects involved in clinical trial.
- B. verification of the credibility and integrity of clinical trial data generated.
- C. verification of the compliance with various regulatory provisions as per Drugs & Cosmetics rules.
- D. all the above.

ANSWER: D

191. Expansion of EC _____

- A. Ethical Company.
- B. Ethics Committee.
- C. Ethic Committee.
- D. Ethics Company.

ANSWER: B

192. The term used to describe the branch of law which protects the application of thoughts, ideas and information which are of commercial value is _____.

- A. International Property Right.
- B. Intellectual Property Rules.
- C. Intellectual Property Right.
- D. Intellectual Priority Right.

ANSWER: C

193. The confirmatory test used to diagnose AIDS is

- A. ELISA
- B. Western blot
- C. ESR
- D. PCR

ANSWER: B

194. Intellectual Property Rights covers_____.

- A. the law relating to patents & copyrights rights
- B. trademarks, trade secrets and other similar.
- C. both a & b.
- D. trademarks & trade secrets only.

ANSWER: C

195. A patent is a grant of exclusive rights for _____.

- A. a limited time in respect of a new and useful invention.
- B. duration differs depending on national legislation.
- C. provide a wide range of legal rights.
- D. all the above.

ANSWER: D

196. IECs is termed as_____.

- A. International Ethical Committee.
- B. Intellectual Ethical Committee.
- C. Institutional Ethics Committee.
- D. Intellectual Ethic Committee.

ANSWER: C

197. Nanobiotechnology deals with materials of the size _____ nm.

- A. 10-3.
- B. . 10-6.
- C. 10-9.
- D. 10-1.

ANSWER: C

198. Which one of the following technology is used in making memory chips?

- A. Nano design.
- B. Nano fabrication.
- C. Micro assay.
- D. Tissue engineering.

ANSWER: B

199. Nano membranes have a pore size of _____ nm.

- A. 1-10.
- B. 10 -100.
- C. 0.1-1.
- D. 100-1000.

ANSWER: A

200. The study that involves the behavior, manipulation and control of fluids that are confined to nanometers is called as _____.

- A. nanoarray.
- B. nanocapillary.
- C. nanofluids.
- D. all the above.

ANSWER: C

201. Nano needles in nano micro surgery made up of _____.

- A. silicon.
- B. iron.
- C. copper.
- D. gold.

ANSWER: A

202. The gas used in carbon nano tube manufacturing is _____.

- A. helium.
- B. argon.
- C. neon.
- D. oxygen.

ANSWER: A

203. A network or circuit of biological neurons is called as _____.

- A. neural network.
- B. neuron.
- C. neuron network.
- D. biological network.

ANSWER: A

204. A clinical study is required for an IND if it is intended to support a _____.

- A. change in the approved route of administration or dosage level.

- B. change in the approved patient population.
- C. significant change in the promotion of an approved drug.
- D. all the above.

ANSWER: D

205. The FDA reviews the IND application for _____.

- A. safety to assure that research subjects.
- B. non safety assurance.
- C. safety to assure that non research subjects.
- D. safety assurance not required.

ANSWER: A

206. Once the application is cleared, the candidate drug usually enters a _____ clinical trial.

- A. Phase I.
- B. Phase II.
- C. Phase III.
- D. Post.

ANSWER: A

207. The use of an investigational new drug in human subjects requires approval by the _____.

- A. FDA
- B. FAD.
- C. FDD.
- D. FAA.

ANSWER: A

208. The destruction of microorganisms by heating is due to _____.

- A. Denaturation of proteins.
- B. hydrolysis of carbohydrate.
- C. dehydration of fluid.
- D. autolysis of fat.

ANSWER: A

209. What is SCP?

- A. Single clone protein.
- B. Single cell protein.
- C. small cell protein.
- D. same cell protein.

ANSWER: B

210. Drug-receptor modeling may be considered based on _____.

- A. key based system.
- B. lock based system
- C. lock & key system.
- D. lock & open System.

ANSWER: C

211. Which organ is mainly involved in drug metabolic activity?

- A. Kidney.
- B. Lungs.
- C. Heart.
- D. Liver.

ANSWER: D

212. The substrates used for the production of SCP is _____.

- A. bacteria.
- B. yeasts.
- C. fungi.

D. all the above.

ANSWER: D

213. _____ trial procedures are needed to launch a drug.

- A. Screening.
- B. Treatment.
- C. Clinical.
- D. Medical.

ANSWER: C

214. Bioequivalence Guidelines include _____.

- A. documentation and Good Lab Practice.
- B. documentation only.
- C. Good Lab Practice only.
- D. non documentation and Good Lab Practice.

ANSWER: A

215. NCI Stands for _____.

- A. National Center Investigation.
- B. National Cleaning Institution.
- C. National Cancer Institute.
- D. Natural Cloning Information.

ANSWER: C

216. The abnormal gene could be repaired through _____.

- A. replication.
- B. duplication.
- C. selective reverse mutation.
- D. translation.

ANSWER: C

217. The non lymphatic white blood cells are called as _____.

- A. cancer cells
- B. natural cells.
- C. stem cells.
- D. myeloid cells.

ANSWER: D

218. Abnormal gene is swapped through _____ to regain normal function.

- A. Hormone therapy.
- B. Gene therapy.
- C. Non hormonal therapy.
- D. Mutational therapy

ANSWER: B

219. Diseases can be detected by _____.

- A. Screening.
- B. Prevention.
- C. Treatment.
- D. Medicine.

ANSWER: A

220. The migration of cancerous cells to other tissues via circulatory or transport systems is called _____.

- A. mitosis.
- B. metastasis.
- C. megatasis.
- D. microtasis.

ANSWER: B

221. Risk Factors of Cancer include _____.

- A. tobacco use.
- B. cigarette Smoking.
- C. radiation.
- D. all the above.

ANSWER: D

222. Characteristics of Cancer Cells include _____.

- A. immortalization.
- B. loss of contact inhibitions.
- C. Increased rate of glycolysis.
- D. all the above.

ANSWER: D

223. Vaccines are prepared from killed microbes ,they are

- A. Inactivated (killed) vaccines
- B. Attenuated vaccines
- C. Autogenous vaccines
- D. None of these

ANSWER: A

224. The study of the spread of disease is called as _____.

- A. etiology .
- B. Population Genetics.
- C. Phytopathology.
- D. Pathology.

ANSWER: D

225. Adenovirus infects _____.

- A. higher plants.
- B. animals.
- C. humans.
- D. lower animals.

ANSWER: C

226. The cross linkage of antigens by antibodies is known as _____.

- A. agglutination.
- B. complement fixation.
- C. a cross reaction.
- D. all of these.

ANSWER: A

227. The first vaccine was developed by _____.

- A. Louis Pasteur
- B. Edward Jenner
- C. Carl Landsteiner
- D. Joseph Miester

ANSWER: A

228. The microorganisms involved in food spoilage is _____.

- A. Pseudomonas fluorescens.
- B. yeast
- C. Lactobacillus.
- D. all the above.

ANSWER: D

229. Which one is a food preservation technique?

- A. Antibiotics.
- B. Boiling at low temperature.
- C. Drying in moisture environment.
- D. Canning.

ANSWER: D

230. Antibiotics are mostly obtained from _____.

- A. Fungi.
- B. Actinomycetes.
- C. Cyanobacteria.
- D. a and b.

ANSWER: D

231. Drug design processed with computer modeling techniques are referred as _____.

- A. computer-aided drug design.
- B. computer related drug design.
- C. Non computer-aided drug design.
- D. Relational drug design.

ANSWER: A

232. Traditional methods of drug discovery which rely on trial-and-error testing of chemical substances are referred as _____.

- A. rational drug design.
- B. computer aided drug design.
- C. relational drug design.
- D. combinatorial drug design.

ANSWER: A

233. What is the abbreviation for CADD?

- A. Computer aided drug designing.
- B. Combinatorial aided drug designing.
- C. Computer aided drug development
- D. Combinatorial aided drug development.

ANSWER: A

234. Minicells vaccine is derived from _____.

- A. bacteria.
- B. virus.
- C. fungi.
- D. algae.

ANSWER: A

235. Clinical Trial in ICMR Clinical Trial Registry was initiated after 15th June _____.

- A. 2000.
- B. 2010.
- C. 2009.
- D. 2001.

ANSWER: C

236. The multitude of different parameters are currently measured in the clinical laboratory by means of _____ based methods.

- A. physiological.
- B. biosensor.
- C. chemical.
- D. computer.

ANSWER: B

237. The spatial unity of physical transducer and a biological recognition is system termed as _____.

- A. biosensor.
- B. chemical sensor.
- C. affinity sensor.
- D. analytical sensor.

ANSWER: A

238. The biological recognition component in sensors may be _____.

- A. enzyme, antibody.
- B. cell, receptor.
- C. nucleic acid.
- D. All the above.

ANSWER: D

239. Structure-based drug design relies on knowledge of the three dimensional structure of the biological target obtained by _____.

- A. x-ray crystallography .
- B. NMR spectroscopy.
- C. a and b.
- D. UV ray crystallography.

ANSWER: C

240. Tissue typing is a group of procedures that determines the type of _____.

- A. histocompatibility antigens on a person's cells.
- B. histocompatibility antigens on a person's tissues.
- C. histocompatibility antigens on a person's cells or tissues.
- D. non- histocompatibility antigens on a person's cells or tissues.

ANSWER: C

241. A cytokine that stimulates the activity of B and T cells is _____.

- A. lymphotoxin.
- B. interleukin-2.
- C. interleukin-1.
- D. all of these.

ANSWER: B

242. The Human Genome Project officially began in

- A. 1988.
- B. 1990.
- C. 1992.
- D. 1995.

ANSWER: B

243. A molecule that causes the body to produce an immunological response is _____.

- A. antigen.
- B. antibody.
- C. microgen.
- D. microbody.

ANSWER: A

244. Small simple molecules are _____.

- A. poor antigens.
- B. rich antigens.
- C. moderate antigens.
- D. heterophilic antigens.

ANSWER: A

245. Tissue typing is a procedure in which the tissues of a prospective donor and recipient are tested for compatibility prior to tissue _____.

- A. transplantation.
- B. transduction.
- C. transformation.
- D. translation.

ANSWER: A

246. First cloned animal _____

- A. Dolly sheep
- B. Dog
- C. Mule
- D. Cat

ANSWER: A

247. The modern popularity of the immunoassay is almost directly related to the development of _____.

- A. recombinant mAb technology.
- B. recombinant mAg technology.
- C. restriction mAb technology.
- D. recombinant rDNA technology.

ANSWER: A

248. In molecular biology, hybridization is used in DNA or RNA samples to detect the presence of _____ sequences.

- A. new.
- B. nuclear.
- C. nucleotide.
- D. multiple.

ANSWER: C

249. TC cells are important in controlling _____.

- A. virus infections .
- B. allergy.
- C. autoimmunity.
- D. all of these.

ANSWER: D

250. Which type of cell actually secretes antibodies?

- A. plasma cells.
- B. T cells.
- C. macrophages.
- D. dendritic cells.

ANSWER: A

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