

MOLECULAR BIOLOGY

MIDTERM EXAM

إعداد :



Molecular Biology Archive:

- 1) All of the following are PCR reaction component except:
 - a) Thermostable DNA polymerase
 - b) dNTP's
 - c) Ca^{+2}
 - d) Buffer solution
 - e) Pair of primers
- 2) Which step (phase) of PCR reaction where dNTP's were added?
 - a) Annealing
 - b) Denaturation
 - c) Extension / Elongation
 - d) Termination
- 3) One of the following is quantitative PCR modification:
 - a) Multiplex PCR
 - b) Long range PCR
 - c) Real Time PCR
 - d) Reverse transcriptase PCR
 - e) Sequence Specific PCR
- 4) All the following regarding DNA polymerase are correct except:
 - a) The optimum temperature for *Thermus aquaticus* is 72C
 - b) It has proofreading exonuclease activity
 - c) Taq polymerase is heat resistance
- 5) What is the cofactor for the polymerase enzyme?
 - a) Mg^{+2}
 - b) Ag^{+2}
 - c) Ca^{+2}
- 6) Regarding to the RNA dependent DNA polymerase choose the correct answer:
 - a) Synthesizing DNA strand from the RNA templet
 - b) Consider as reverse transcriptase
 - c) Synthesizing RNA strand from DNA templet
- 7) Telomeres are present in?
 - Human's Chromosomes

- 8) What is the repeat Sequence of the telomeres in human?
➤ TTAGGG
- 9) Female with retarded sexual development, short stature, webbing of the skin in neck regions. What disease does she is suffering from?
➤ Turner syndrome
- 10) Reason for the mutations in the mitochondrial DNA?
➤ Y chromosome is inherited from the father, so it didn't get recombined or shuffled when passed from father to son.
- 11) If the O in this sequence (ABCDEOFG) is centromere ... What sequence represents pericentric inversion?
➤ ABCFOEDG
- 12) Uridine?
a) Uracil + Ribose
b) Uracil + Deoxyribose
- 13) The cause of alkali in RNA?
➤ Cleavage of the phosphodiester bonds
- 14) Which is the bases that need lower energy to denature:
a) 25% thiamine
b) 25% guanine
c) 25% adenine
d) 40% adenine
e) 40% cytosine
- 15) Reverse transcriptase PCR use to build _____ that template to _____.
➤ c-DNA, m-RNA.
- 16) After a denaturation of a plant virus, the following results were shown:
39% G
11% A
39% C
11% T
What is the outcome?
➤ Virus controlled human DNA to build it's DNA
➤ It contains RNA + DNA
- 17) What is the alternative splicing?
➤ The use of Exons and Introns
- 18) Which of the following is false about transcription in eukaryotes and prokaryotes?
➤ Eukaryotes have sigma factor to initiate the –transcription
- 19) Why do mutations in mt-DNA accumulate?
a) because mt-DNA doesn't have a repair mechanism
b) because of very harmful reactive oxygen species
c) because there is no shuffling of gene
- 20) Regarding mRNA, one is correct:
➤ It has a short half-life

21) What is false about mt-DNA?

- a) Inherited from mother
- b) Not covered with histone
- c) Lacks exons
- d) Contains 37 genes
- e) 24 of its genes provide instruction for making enzyme
- f) 24 of its genes provide instructions for t-RNA and r-RNA

22) Which of the following will denature at lower temperature?

- a) DNA of 40% adenine
- b) DNA of 25% adenine
- c) DNA of 25% thymine
- d) DNA of 25% guanine
- e) DNA of ... cytosine

23) What is false about regulatory proteins?

- a) Protein-DNA interactions are maintained by hydrogen bonds and covalent bonds
- b) Proteins should have high affinity to specific site and low affinity to other DNA
- c) Only small region of protein make direct contact with DNA

24) What is false about Z DNA?

- a) Left handed
- b) 12 base pairs per turn
- c) Plays a role in regulating gene transcription
- d) Extremely narrow but very deep
- e) Exist when particular base sequences are present

25) Human telomere repeats sequence?

➤ TTAGGG ✓

26) Which of the following is false?

- a) Mt-DNA is circular
- b) Eukaryotes have circular chromosome
- c) Eukaryotes copies chromosomes then the cell grows....

27) Which of this doesn't have DNA?

- a) Telomere
- b) Centromere
- c) Chromatated
- d) Kinetochore

28) The zinc finger motif, choose the wrong statement:

- A) Each zinc finger contacts about 5 bp of DNA
- B) The zinc is required to maintain the tertiary structure of this domain
- C) The nucleotide recognition signal is contained within the beta-sheets
- D) Zinc either bound to four cysteine or two cysteine and two histidine
- E) A zinc finger is made up of about 20 amino acids

29) Which of the following does not play part in DNA stability:

- a) Electrostatic interactions between phosphate groups and different cations
- b) Hydrophobic interactions between nitrogen bases
- c) The absence of the 3-hydroxyl group in DNA
- d) Hydrogen bond between DNA backbone and surrounding water
- e) Hydrogen bond between purines and pyrimidines

30) One of the following is required for protein synthesis in eukaryotic cells but not required in prokaryotes:

- a) rRNA and peptidyl transferase.
- b) Elongation factors and peptidyl transferase
- c) Amino acyl tRNA and GTP
- d) GTP and initiation factors
- e) PABP

31) One of the following best describes a property of histidinyI-tRNA synthetase:

- a) Recognition and linking a particular amino acid and a tRNA for that amino acid
- b) To bind puromycin, this terminates protein synthesis
- c) To covalently link amino acids to the 5 end of a corresponding tRNA
- d) To form an aminoacyl- tRNA synthetase complex in the absence of energy
- e) To initiate transcription by interacting with the 30S ribosomal subunit

32) The leucine zipper motif, choose the wrong statement:

- a) Two helices dimerize through hydrophobic interactions to form a coiled coil
- b) Two monomers associate through the antiparallel beta 3 sheets to form a dimer
- c) Function as dimmers to regulate gene transcription
- d) Is an α -helix made up of 30 to 40 amino acids
- e) Contains a leucine every seven amino acid

33) Which of the following is true of histones?

- a) The amino acid sequences of histone proteins are very similar in different organisms
- b) All histones form part of the nucleosome core particles in chromatin
- c) Histones are widely found in prokaryotes D. Histones are acidic proteins
- d) Histones are found in animal chromatin but not in plant cells

34) Which of the following statements about G proteins is false:

- a) They become activated when bound to GDP
- b) They must be active before the cell can make needed cAMP
- c) They coupled to extracellular receptor
- d) They are involved in signal cascades
- e) They bind to and are regulated by guanine nucleotides

- 35) Some antibiotics are inhibiting protein synthesis by blocking translocation of mRNA relative to ribosomes, they include:
- Erythromycin and chloramphenicol
 - Tetracycline and fusidic acid
 - Fucidic acid and erythromycin**
 - Puromycin and fucidic acid
 - Chloramphenicol and erythromycin
- 36) True replication of DNA is possible due to:
- Phosphate backbone
 - Complementary base pairing rule**
 - London forces
 - Hydrogen bonding
 - None of the above
- 37) The direction of amino acid transfer to the growing polypeptide chain is:
- From the peptidyl tRNA site to the aminoacyl tRNA site on the ribosome**
 - From the aminoacyl tRNA site to the exit tRNA site on the ribosome .
 - From the peptidyl tRNA site to the exit tRNA site on the ribosome
 - From the aminoacyl tRNA site to the peptidyl tRNA site on the ribosome
 - From the peptidyl tRNA site to the aminoacyl tRNA site on the 30S ribosomal subunit
- 38) Which histones are associated with the linker DNA of a nucleosome?
- Histone H3
 - Histone H4
 - Histone H5
 - Histone H1**
 - Histone H2A and H2B
- 39) Okazaki fragments occur during:
- Polymerase reaction
 - Synthesis
 - Transcription
 - Transformation
 - Replication**
- 40) The holes between DNA bases, choose the wrong statement:
- When DNA twist the distance between sugar and phosphate become shorter**
 - The twisting of the two strands around one another from a double helix with a minor groove
 - The twisting of the two strands around one another from a double helix with a major groove
 - The distance between two sugars is about double that of the thickness of the nitrogen bases
 - Each base pair is twisted about 36 to the next

41) Topoisomerases:

- a) Change the degree of supercoiling of a DNA molecule but not its linking number of DNA
- b) Occur in bacteria, but not in eukaryotes
- c) Require energy from ATP
- d) Always change the linking number in increments of 1
- e) Can act on a single strandad DNA

42) 6.4 photoproduct produced due to exposure to:

- a) Base tautomers
- b) Intercalating agents
- c) Ionizing radiation
- d) Base modifying
- e) None of the above

43) Which of the following statements is not correct:

- a) Genetically determined diseases are marginal group that make up a substantial proportion of diseases
- b) Yeast are eukaryotes cells
- c) Viruses helped in proving that DNA and not proteins contain the genetic information
- d) If a bacterium can grow in a minimal medium it is called prototroph
- e) Tumor cells can grow indefinitely and are easier than normal cells to propagate in culture

44) The important functional groups participating in H-bond formation in DNA nitrogen bases include all of the following except:

- a) Nitrogens at position 1 of adenine
- b) Oxygen atom at position 2 of cytosine
- c) Oxygen atom at position 2 of thymine
- d) Nitrogens at position 3 of cytosine
- e) Nitrogens at position 3 of thymine

45) Grooves, choose the wrong statement:

- a) Most regulatory proteins and and drugs bind to DNA through the minor groove
- b) The sugar-phosphate backbones of the helix are not equally spaced along the helix axis
- c) N7 atom of the purine ring and the C5 atom of the pyrimidine ring face out into the major groove
- d) The minor groove is 12 Å wide

46) Cloning of DNA from any organism involves the following steps except:

- a) Joining two DNA fragments through hydrogen bonds using DNA ligase
- b) Moving recombinant DNA from the test tube to a host cell
- c) Selecting or identifying host cells that contain recombinant DNA
- d) Cutting DNA at precise locations using restriction enzymes
- e) Selecting cloning vectors including plasmid