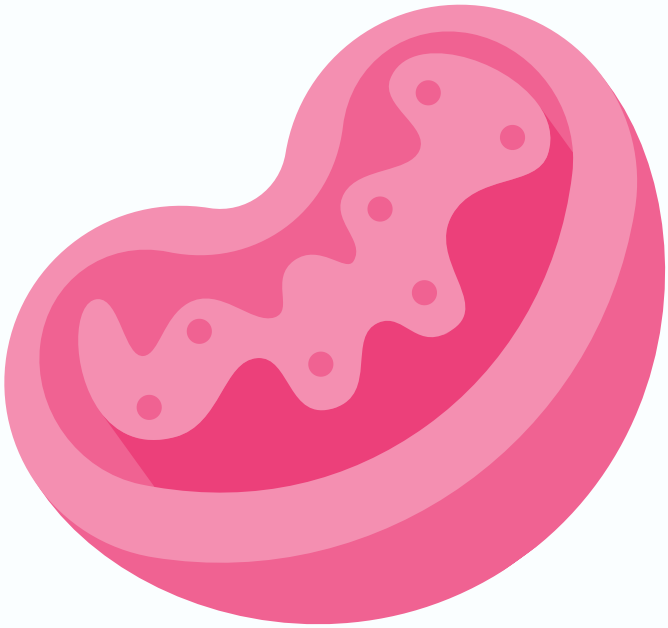
لجنة الطب والجراحة

MOLECULAR BIO ARCHIVE

MIDTERM

دفعة أثر



DONE BY REEM GHABAYEN

LECTURE 1 +2

1. Regarding genetics and medicine, one of the following statements is not correct:

a. Genetically determined diseases are a marginal group.

b. More than 3000 defined human genetic diseases are known.

c. Genetic testing may be undergone prior to marriage, during pregnancy or after birth to detect diseases.

d. None of the above is incorrect.

.ANSWER: A

2. In a virus we had: U:26%, G:24% and C: 24%, one the following is correct:

a. We can't determine the rest.

b. A: 26%

c. A: 24%

d. A: 50%

ANSWER: B

3. The genome in human beings resembles:

a. DNA and all types of RNA.

b. DNA in nucleus and mitochondria.

c. DNA, ribosomes, cells.. etc

d. none of the above

ANSWER: B

4. The following structure resembles:

a. Guanine nucleotide

b. Guanosine nucleotide

c. A nucleotide in DNA

d. A nucleotide in RNA

e. A nucleoside in DNA and RNA

ANSWER: C

LECTURE 1 +2

5. Guanosine -5'- monophosphate is:

a. A nucleotide in DNA

b. A nucleotide in RNA

c. A nucleoside in DNA

d. A nucleoside in RNA

e. A nucleotide in both DNA and RNA

ANSWER: E

6. The hydrogen bonds formed between the nitrogenous bases in DNA include all of the following except:

a. Adenine #6 with thymine #3

b. Adenine #3 with thymine #3

c. Guanine #6 with cytosine #4

d. Guanine #3 with cytosine #3

e. Guanine #2 with cytosine #2

ANSWER: E

7. Regarding Leucine Zipper Motif, one of the following is incorrect:

a. Composed of 30 to 40 amino acid residues.

b. We find a leucine every seven amino acids.

c. It contains a nucleotide recognition signal

d. Each one contacts about 5 bps of DNA

e. None is incorrect.

ANSWER:C

8. Consider having 50 bps of A-DNA, B- DNA and Z-DNA, one of the following is correct:

a. Z- DNA is the longest.

b. B- DNA is the longest.

c. A- DNA is the longest.

d. none of the above is correct.

.ANSWER: A

LECTURE 1 +2

9. Regarding Motifs, one of the following is incorrect:

a. Zinc Finger Motif has four cysteines

b. Zinc Finger Motif has two cysteines and two lysines

c. Helix- Turn- Helix Motif is composed of three antiparallel Beta sheets and three alpha helices.

d. Helix- Loop- Helix Motif can dimerize

e. None of the above in incorrect.

ANSWER: B

10. Regarding mitochondrial DNA, one of the following is incorrect:

a. We kill the mother nucleus to avoid spreading related diseases.

b. It contains 37 genes.

c. Mutations in mtDNA may increase the production of ROS.

d. We use an egg donor and we transfer the mother nucleus to it.

e. None of the above is incorrect

ANSWER: A

11. One of the following is correct regarding purines and pyrimidines binding:

a. we always bind a purine to a pyrimidine, since binding two purines give too wide structure and binding two pyrimidines give too narrow structure.

b. Purines and pyrimidines can only bind to each other in DNA and not in RNA.

C. The binding of two purines or two pyrimidines can result in a stable and functional nucleic acid structure.

D. The binding of purines and pyrimidines is solely determined by the availability of complementary base pairs.

E. None of the above is correct

ANSWER: A

LECTURE 1 +2

12. Which of the following hydrogen bond formations between nitrogenous bases in DNA is incorrect?

a. Adenine #1 with thymine #4

b. Adenine #2 with thymine #2

c. Guanine #3 with cytosine #6

d. Guanine #4 with cytosine #3

e. Guanine #5 with cytosine #2

ANSWER: C

s to avoid spreading related diseases.

13. If there is 23% adenine in a strand of DNA, the amount of guanine in it will be:

A) 23%

B) 27%

C) 46%

D) 54%

ANSWER: B

14. The ribose in DNA is:

A) 2- deoxy- beta- D- ribose

B) 2- deoxy- alpha- D- ribose

C) 2- deoxy- beta- L- ribose

D) 2- deoxy- alpha- L- ribose

ANSWER: A

LECTURE 3

1. The human sequence telomere is:

A) TTAGGG
B) TTTAGG
C) TTTTAG
D) TAGGGG
E) None of the above

ANSWER: A

2. One of the following histones is associated with clamping the whole nucleosome:

A) H1
B) H2A
C) H2B
D) H3
E) H4

ANSWER: A

3. The following provides terminal stability to the chromosomes and ensures its survival:

A) Telomeres
B) Telomerase
C) Helicase
D) Ligase

ANSWER: A

4. Monosomy means:

A) A loss of one chromosome
B) A gain of one chromosome
C) A gain of a whole chromosomal set
D) A loss of one chromosome pair

(ANSWER: A

LECTURE 3

5. The following karyotype 47, XX, +21 best suits:

A) A female with trisomy having an extra copy on chromosome #21, Down Syndrome

B) A female with trisomy having an extra copy on chromosome #21, Turner Syndrome

C) A Male with trisomy having an extra copy on chromosome #21, Down Syndrome

D) A female with monosomy having an extra copy on chromosome #21, Down Syndrome

ANSWER: C

6. A syndrome mostly characterized with mental deficiency, cleft palate, cardiac anomalies. Best suits:

A) Patau

B) Down

C) Edwards

D) Klinefelter

E) Turner

ANSWER: A

8. Chromosomal karyotyping is done in:

A) Anaphase

B) Prophase

C) Metaphase

D) Telophase

ANSWER: C

LECTURE 4

1. One of the following is incorrect regarding DNA ligase reaction:

A) DNA ligase reaction does not require ATP.

B) DNA ligase catalyzes the formation of phosphodiester bonds.

C) DNA ligase is essential for DNA replication and repair.

D) DNA ligase joins the Okazaki fragments during lagging strand synthesis.

E) DNA ligase is an enzyme that seals nicks in the DNA backbone.

.ANSWER: A

2. One of the following resembles a major difference between prokaryotic and eukaryotic DNA replication:

A) DNA replication in eukaryotes is dispersive

B) DNA replication in prokaryotes is conservative

C) The origin of DNA replication in prokaryotes is single

D) None of the above

E) All of the above

(ANSWER: C

3. Sliding clamp is responsible for:

A) prevents DNA pol III from dissociating from the template DNA strand

B) unwinding the DNA double helix during replication

C) synthesizing RNA primers for DNA replication

D) repairing DNA damage

E) proofreading the newly synthesized DNA strand for errors

(ANSWER: A

4. DNA polymerase III activity requires energy; this energy is derived from:

A) ATP

B) CTP

C) GTP

D) The added successive nucleotides

(ANSWER: A

LECTURE 4

5. An enzyme responsible for the removal of the RNA primer from the lagging strand is:

A) DNA pol I

B) Rnase H

C) DNA pol III

D) SSBP

E) DNA ligase

ANSWER: B

6. Which of the following statements about DNA replication is incorrect?

A) The leading strand is synthesized in the 5' to 3' direction.

B) The lagging strand is synthesized in the 3' to 5' direction.

C) The leading strand is synthesized continuously.

D) The lagging strand is synthesized discontinuously in the form of Okazaki fragments.

.ANSWER: B

7. Which of the following statements about the sliding clamp in DNA replication is correct?

A) The sliding clamp is a protein that helps unwind the DNA double helix.

B) The sliding clamp is responsible for proofreading and repairing errors in DNA replication.

C) The sliding clamp helps to stabilize the interaction between DNA polymerase and the template strand.

D) Clamp- polymerase interactions are less strong and less specific than the direct interaction between polymerase- DNA structure

ANSWER: C

LECTURE 4

8. One of the following DNA repair mechanisms is used in large DNA samples:

A) BER

B) NER

C) MMR

D) none of the above

ANSWER: B

LECTURE 5

1. One of the following is the correct order of transcription initiation factors corresponding to the given sizes: 92, 27, 15, and 35:

A) TFIID-TBP, TFIIE, TAFIIS, TFIIA

B) TFIIE, TFIID-TBP, TAFIIS, TFIIA

C) TFIIE, TFIID-TBP, TFIIA, TAFIIS

D) TFIID-TBP, TAFIIS, TFIIE, TFIIA

ANSWER: B

2. One of the following is not a modification of tRNA:

A) Removal of bps

B) Addition of CCA at 5' end

C) Formation of pseudouridine

D) Excision of introns

ANSWER: B

3. If the AC was not successfully added to the 3' end of tRNA, what mutation is expected to happen:

A) tRNA can no longer bind AA.

B) tRNA won't bind mRNA

C) No protein synthesis will happen

D) No mRNA synthesis will happen

.ANSWER: C

LECTURE 5

4. A mutation in the following can prevent hnRNA from being converted into mRNA:

A) Endonuclease mutation

B) Exonuclease mutation

C) Both endonuclease and exonuclease mutations

D) Neither endonuclease nor exonuclease mutations

.ANSWER: D

5. One of the following is incorrect regarding RNA- dependent DNA polymerase:

A) Has another name of RT

B) It is found in all viruses

C) It uses RNA template to synthesize DNA

D) None of the above

(ANSWER: B

6. One of the following best describes alternative splicing process:

A) The process of removing introns from pre-mRNA to produce mature mRNA.

B) The process of joining exons together to produce mature mRNA.

C) The process of selecting different combinations of exons from pre-mRNA to generate multiple mRNA isoforms.

D) The process of degrading mRNA molecules after translation.

.ANSWER: C

7. Regarding Wobble position, one of the following is incorrect:

A) It is two- fold degenerate site.

B) It has to do with genetic codes redundancies

C) Change of the 3rd site bp may incorporate a new AA

D) The change of the 3rd site bp is imprecise

ANSWER: D

LECTURE 5

8. One of the following is correct regarding aminoacyl tRNA synthetase activity:

A) It uses ATP and release pyrophosphate

B) It is identical to all AA

C) It differs from an AA to another, but has specificity

D) None of the above is correct

ANSWER: C

9. Ribosomes play a major role in all of the following activities except:

A) Peptide bonds formation

B) Aminoacylation of tRNA

C) tRNA binding to mRNA

D) tRNA discovery of the start codon

ANSWER: D

10. Highest percentage of possible mutations and lowest percentage of protection can be found in:

A) Synonymous degenerate site

B) Twofold degenerate site

C) Threefold degenerate site

D) Non degenerate site

(ANSWER: A

LECTURE 5

11. Consider the following events of stages in amino acids elongation on the ribosomes:

1. Peptide bond formation

2. Joining of the ribosomal subunits

3. P- site binding

4. A- site binding

5. E- site binding

6. Translocation

The correct order will be:

- **2, 4, 1, 6, 3, 5.**
- **2, 3, 1, 6, 4, 5.**
- **2, 3, 4, 1, 6, 5.**
- **2, 3, 1, 4, 6, 5.**
- **2, 4, 3, 6, 1, 5.**

.ANSWER: C

12. One of the following matches is correct regarding protein synthesis inhibiting drugs:

A) Formation of the initiation complex and binding of aminoacyl- tRNA to the ribosomal A site is blocked by streptomycin and tetracycline

B) Introduction of aminoacyl- tRNA and synthesis of a peptide bond is inhibited by puromycin and erythromycin

C) Translocation of mRNA relative to the ribosome is prevented by fusidic acid and aminoglycosides

D) all are correct.

(ANSWER: A

LAB 1

2. We can extract DNA from various samples except one of the following:

A) WBCs

B) RBCs

C) Brain cells

D) Buccal swab

Answer: B

3. Regarding Miniprep kit, one of the following is correct:

A) It is a (50- 100 microgram) kit for plasmid DNA

B) It is a (50- 100 microgram) kit for RNA

C) It is a (50- 100 microgram) kit for genomic DNA

D) It is a (50- 100 microgram) kit for protein purification

Answer: A

4. One of the following represents the correct order of the three basic steps in DNA extraction:

A) Lysis, Precipitation (inactivation), Purification

B) Purification, Precipitation, Lysis

C) Precipitation, Lysis, Purification

D) Lysis, Purification, Precipitation

ANSWER: A

5. We use EDTA in gene extraction because:

A) EDTA has a sequestering ability to Ca+2 and Mg+2 required for nuclease activity

B) EDTA acts as a catalyst in the DNA extraction process.

C) EDTA helps in breaking down the DNA molecules into smaller fragments.

D) EDTA is responsible for stabilizing the DNA samples during extraction.

ANSWER: A

LAB 1

6. Choose the terms that fit the spaces the best: we use _____ for DNA integrity testing and we use _____ to make DNA pullets.

A) Polymerase chain reaction and spectrophotometer.

B) Gel electrophoresis and centrifuge.

C) Microarray and microscope.

D) DNA sequencing and pipette.

.ANSWER: B

7. Guanidinium Hydrochloride is:

A) A chaotropic salt that is a part of binding solution

B) A chaotropic salt that is a part of eluting solution

C) A reducing agent that helps break disulfide bonds in protein

D) A pH indicator used in DNA extraction procedures

Answer: A

8. Given an OD of 0.2, DF of 10, a final volume of 50 microliters of a dsDNA, the amount (yield) of DNA is:

A) 5000 nanograms

B) 5000 micrograms

C) 5000 nanograms/ microliters

D) 500 nanograms

Answer: A