

# Molecular Basis of Inheritance

## CHAPTER-5

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Q. 1. Is there a termination codon in the genetic code?

- (a) UAA
- (b) UAG
- (c) UGA
- (d) all of the above

Q. 2. DNA The final proof that it is a genetic material was obtained from which of the following experiments?

- (a) Griffith
- (b) Avery
- (c) Hershey and Chase
- (d) McLeod and Carty

Q.3. A double-stranded DNA By which of the following are the bases of the two strands in the molecule joined?

- (a) Through hydrogen bonds
- (b) Through covalent bonds
- (c) By the bond S=S
- (d) through ester bond

(a)

Q. 4. Lac operon contains the sequence of structural genes?

- (A) LacA, LacY, LacZ
- (b) LacA, LacZ, LacA
- (c) LacY, LacZ, LacA

(d) LacZ, LacY, LacA  
(d)

Q. 5. What is the synthesis of m-RNA called?

- (a) transition
- (b) transformation
- (c) transcription
- (d) transfer

Q.6. Synthesis of DNA is called?

- (a) replication
- (b) transcription
- (c) translation
- (d) deamination

Q. 7. Who proposed the name genetic code?

- (a) Francis Crick
- (b) Konberg and Mathai
- (c) George Gamow
- (d) Hargobind Khurana

Q. 8. DNA inside chromosome? Gave experimental proof that replication is semi-conservative.

- (a) Maiselson and Stoll
- (b) Taylor and others
- (c) Watson and Crick
- (d) Konberg and Mathai

Q. 9. The total number of codons in the genetic dictionary is-

- (a) 3
- (b) 20
- (c) 64
- (d) 01

(c)

Q. 10. Central Dogma theory was proposed.

- (a) Beadle and Totum
  - (b) Temin and Baltimore
  - (c) Crick
  - (d) Franklin and Chargoff
- (c)

Q. 11. Nucleoside is-

- (a) Nitrogenous base + sugar
  - (b) Nitrogenous base + sugar + phosphate
  - (c) Nitrogenous alkali + phosphate
  - (d) Sugar + phosphate backbone
- (a)

Q. 12. What are those parts of DNA which are capable of changing their position called?

- (a) Axon
- (b) intron
- (c) Systron
- (d) transposon

(d)

Q. 13. Where are Okazaki blocks found?

- (a) in the transcription unit
- (b) in the leading strand
- (c) in lagging stretch

- (d) On the RNA arm
- (c)

Q. 14. The method of DNA finger printing was developed by –

- (a) Taylor
- (b) Franklin
- (c) Alec Jeffrey
- (d) Crick

(c)

Q. 15. What is the effector molecule in lac operon?

- (a) Glucose
  - (b) Repressor protein
  - (c) Parmage
  - (d) lactose
- (d)

Q. 16. DNA What is the acidic nature of?

- (a) Nitrogenous base
- (b) histone
- (c) Phosphate group
- (d) ribose sugar

(c)

Q. 17. Griffith did his experiments-

- (A) On E. Coli
- (b) On Pseudomonas species
- (c) On pneumococci
- (d) on Clostridium

(c)

Q. 18. There is a method of DNA replication.

- (a) Conservative and one-directional
- (b) Semi-conservative and one-directional

- (c) Conservative and bidirectional
- (d) Semi-conservative and bidirectional

(d)

Q. 19. If the percentage of adenine in a DNA is 30% then what will be the percentage of guanine?

- (a) 10 %
  - (b) 20 %
  - (c) 30 %
  - (d) 40 %
- (d)

Q. 20. During transcription, if the sequence of nucleotides in DNA is ATACG, then what will be the sequence of m-RNA nucleotides?

- (a) UAGCA
  - (b) UAUGC
  - (c) TATGC
  - (d) TCTGG
- (b)

Q. 21. If the number of nucleotides of guanine in a given DNA segment is 75 and that of thymine is 75, then what will be the total nucleotides in that segment?

- (a) 75
- (b) 750
- (c) 225
- (d) 300

(d)

Q. 22. DNA is not a part of the transcription unit.

- (a) Promoter
- (b) constructive
- (c) lac operon
- (d) liquidator

(c)

Q. 23. The first genetic material was.

- (a) DNA
- (b) RNA
- (c) protein
- (d) CSC

(B)

Q. 24. How many crore bases are found in Dystrophin, the largest gene known in humans?

- (a) 2.4 crores
- (b) 3.4 crores
- (c) 4.4 crores
- (d) 5.4 crores

(a)

Q. 25. DNA? It is an enzyme used to join fragments.

- (a) DNA ligase
- (b) DNA polymerase
- (c) DNA helicase
- (d) Restriction enzyme

(a)

## Fill in the blanks-

1. Those segments found in Hn RNA which do not participate in protein synthesis are called\_\_\_\_\_.

Answer: Intron

2. The credit for the development of the method to determine the sequence of amino acids in proteins goes to\_\_\_\_\_.

Answer: Frederick Segar.

3. The acidic substance DNA found in the nucleus was discovered by\_\_\_\_\_.

Answer : by Friedrich Mescher

4. \_\_\_\_\_Functions as a start codon.

Answer : AUG

5. Okazaki fragments are joined together by an enzyme \_\_\_\_\_.

Answer : DNA ligase

6. The genetic material of bacteria and plasmids is \_\_\_\_\_.

Answer : DNA

7. Transformation was discovered by\_\_\_\_\_.

Answer : by Griffith

8. DNA in a nucleosome Base pairs are located in\_\_\_\_\_.

Answer: 200

## Very short answer questions and answers

Q. 1. What is the function of codons AUG and UGA during protein synthesis?

Answer: AUG performs the function of chain initiation. It codes for an amino acid called methionine. UGA serves to terminate the polypeptide chain.

Q. 2. What is the contribution of the genetic map to the Human Genome Project?

Answer: Genetic maps provide information about the polymorphism of the recognition site of the limiting enzyme and the fixed repetitive DNA sequence of the human genome.

Q. 3. How many base pairs are found in human haploid DNA?

Answer :-  $3.3 \times 10^9$  base pairs

Q. 4. Whose tail is found at the end of Hn-RNA?

Answer:- The tail of Poly A- (Polydehylic acid) is found at the 3' end. The tail consists of a series of 200-300 nucleotides.

Q. 5. In what is RNA found as genetic material?

Answer:- Tobacco mosaic virus and beta bacteriophage.

Q. 6. In which direction does polymerization take place by DNA dependent DNA polymerase?

Answer :- 5'-3'

Q. 7. What is called cistron or structural gene?

Answer:- That segment of DNA which codes for polypeptide.

Q. 8. What is called an exon?

Answer: Coding sequences or expressed sequences are called sequences.

Q. 9. What is splicing?

Answer:- The process of separation of intron from Hn-RNA and joining of exon (individual) in a certain sequence is called splicing.

Q. 10. Which gene is found in Lake Prachalek?

Answer :- (1) Regulatory gene  
(2) Enhancer gene  
(3) Operator gene  
(4) Structural genes

Q. 11. What is repetitive DNA?

Answer:- That part of the genome in which a small part of DNA is repeated many times. They do not transcribe RNA for protein synthesis.

Q. 12. Write the name of the longest gene.

Answer:- Dystrophin gene is the largest gene.

Q. 13. What is called palindromic sequence?

Answer:- Such sequences of base pairs which are called DNA if the reading orientation is kept the same. Both the threads are read the same.

Q. 14. Structure of DNA of a centripetal organism. Which amino acids are found in greater quantity in histone protein?

Answer :- Arginine and lysine

Q. 15. What is the bond between nitrogenous base and pentose sugar called?

Answer :- N glycosidic bond

Q. 16. In which phase of the cell cycle does DNA replicate?

Answer :- In S state

Q. 17. Who discovered DNA polymerase?

Answer:- Korenberg did it in E. coli.

drawn by them.

Q. 18. What is genetic code?

Answer:- Genetic code is a microscopic unit in which the code message for protein synthesis is contained.

Q. 19. What is called polymorphism?

Answer:- Variation on genetic basis is called polymorphism. It arises due to mutation.

### Long Questions

Q. 1. What is Nucleosome? Explain the packaging of DNA coil. Also make labeled pictures.

Q. 2. What do you mean by semi-conservative replication? Describe the experiment done by Matthew Meselson and Franklin Stahl to prove that semi-conservative replication occurs in DNA. Draw a diagram of a semiconservative DNA replication model.

Q. 3. What is repetitive DNA? Explain the experiment of Alfred Hershey and Martha Chase to show that DNA is a genetic material?

Q. 4. What is the Human Genome Project? Write the features of Human Genome Project.

Q. 5. Describe the experiment conducted by Frederick Griffith on *Streptococcus pneumoniae*. Discuss the conclusions

Q. 6. Explain how lac operon works in the presence and absence of inducer in the bacterium *E. coli*?

Q. 7. What is DNA fingerprinting? Throw light on the principle, major steps and its utility of this process.

Q. 8. Define DNA. Write the features of the structure of double helical DNA. Draw a labeled diagram of double helix DNA.

Q. 9. What is meant by transcription unit? Explain the transcription process in bacteria by drawing a labeled diagram.

Q. 10. Write a comment on the following.

1. Genetic code
2. t-RNA
3. mRNA

Q. 11. What is the Central Dogma principle? Explain the various stages of translation.

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