

Chapter 24: DNA Replication, Repair and Recombination (omit repair and recombination)

Matching Or Fill In

Choose the correct answer from the list. Not all the answers will be used.

- 1) _____ Enzymes that undergo many rounds of catalysis before dissociating from the substrate are described as _____.
- 2) _____ The section of RNA to which DNA residues are added during replication is the _____.
- 3) _____ (omit red questions) The process whereby nucleotides are removed from the 5' end of one DNA segment and nucleotides are added to the 3' end of the immediately preceding DNA segment is called _____.
- 4) _____ Single-stranded DNA associates with _____ proteins, which prevent the separated DNA strands from reannealing at the replication fork.
- 5) _____ *E. coli* primer synthesis is catalyzed by the _____.
- 6) _____ Termination of replication in *E. coli* involves the binding of the _____ protein at a *Ter* site.
- 7) _____ In yeast, replication begins at sequences known as _____.
- 8) _____ G-rich polynucleotides can form G-quartets, resulting in the formation of _____.
- 9) _____ Direct reversal of pyrimidine dimers in prokaryotic cells is accomplished by the enzyme DNA _____.
- 10) _____ Genes can be moved by _____.
- A) SSB
B) Tus
C) primosome
D) ARS
E) ATS
F) primer
G) transposons
H) nick translation
I) photolyase
J) processive
K) R-loops
L) T-loops

Fill In Questions

- 11) In replicating circular DNA, the “bubble” or “eye” shapes that are observed, are called _____ structures.
- 12) Pol I synthesizes new DNA with very high fidelity, due in part to its _____ capabilities.

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- 13) DNA is unwound by _____.
- 14) *E. coli* leading and lagging strand synthesis takes place at the multisubunit _____.

Multiple Choice Questions

- 15) In most organisms, replication proceeds in a _____ manner from the _____.
- A) unidirectional, chromosome ends
 - B) bidirectional, replication origin
 - C) bidirectional, theta site
 - D) bidirectional, lagging strand
 - E) none of the above
- 16) Lagging strands are polymerized in the _____ direction, and the DNA fragments are about _____ nucleotides long in eukaryotic cells.
- A) 5' to 3', 100–200
 - B) 5' to 3', 1000–2000
 - C) 3' to 5', 100–400
 - D) 3' to 5', 1000–50000
 - E) none of the above
- 17) Which of the following statements about the fidelity of replication are untrue?
- A) Cells maintain a balance of dNTPs.
 - B) DNA polymerase catalyzes synthesis in a two-stage reaction, ensuring the proper base is added.
 - C) Cells do not survive DNA point mutations.
 - D) Pol I and Pol III detect and remove errors.
 - E) Specific repair systems repair and maintain DNA.

Short Answer Questions

Write your answer in the space provided or on a separate sheet of paper.

- 18) What is semiconservative DNA replication? How was it proven?
- 19) Explain Okazaki's model for discontinuous DNA replication.
- 20) Describe some of the accomplishments of Arthur Kornberg.
- 21) What is reverse transcriptase? How did the discovery of reverse transcriptase alter the interpretation of the Central Dogma of Molecular Biology?