

1. The large ribosome subunit in prokaryotes consists of ribosomal proteins and:
 - A) 16S rRNA
 - B) 18S rRNA
 - C) 23S rRNA and 5S rRNA
 - D) 28S rRNA, 5S rRNA, and 5.8S rRNA
2. Messenger RNA is different from other types of RNA because messenger RNA has:
 - A) a 3' poly(A) tail
 - B) introns and exons
 - C) a 3' methylated cap
 - D) a cruciform structure
3. In an RNA molecule, adenine always base-pairs with:
 - A) thymine
 - B) cytosine
 - C) uracil
 - D) guanine
4. In transcription, what is the starting material, ending material, and the major enzyme that catalyzes the process?
 - A) DNA, RNA, DNA polymerase
 - B) RNA, protein, peptidyl transferase
 - C) RNA, DNA, reverse transcriptase
 - D) DNA, RNA, RNA polymerase
5. If the following oligonucleotide of double-stranded DNA was transcribed, what would be the sequence of the RNA?
5'TGCTAGCTA3'
3'ACGATCGAT5'
 - A) 5'UGCUAGCUA3'
 - B) 5'ACGAUCGAU3'
 - C) 3'ACGATCGAT5'
 - D) 3'ACGAUCGAU5'
6. Which of the following enzymes performs transcription in bacteria?
 - A) RNA-dependent DNA polymerase
 - B) DNA-dependent RNA polymerase
 - C) DNA-dependent DNA polymerase
 - D) RNA-dependent RNA polymerase

7. Which of the following types of RNA is directly involved in removing introns from RNA in eukaryotes?
- A) Micro
 - B) Transfer
 - C) Small nuclear
 - D) Small interfering
8. The loop of transfer RNA that interacts with the codon on mRNA in translation is called the:
- A) D loop
 - B) T ψ C loop
 - C) variable loop
 - D) anticodon loop
9. The RNA polymerase holoenzyme consists of which of the following?
- A) α 2, β , β'
 - B) α 2, β , β' σ
 - C) α , α' , β , β'
 - D) α 2, β , β' , ρ
10. Which component of RNA polymerase is responsible for initiating transcription at the right site?
- A) α
 - B) β
 - C) β'
 - D) ρ
 - E) σ
11. DNA sequences that are involved in the regulation of gene expression are called:
- A) cis factors
 - B) trans factors
 - C) attenuators
 - D) repressors
12. Which of the following is the binding site for the repressor protein of the lactose operon?
- A) P site
 - B) Operator
 - C) A site
 - D) Promoter
13. Which of the following would prevent transcription of the lactose operon?
- A) Loss of promoter
 - B) Presence of inducer
 - C) Loss of the repressor protein
 - D) RNA polymerase binding to the promoter

14. Which of the following is a cis factor of the lactose operon?
- A) Inducer
 - B) Operator
 - C) Repressor
 - D) Polymerase
15. In the lactose operon, which of the following configurations would result in gene expression?
- A) Promoter +, Operator +, Repressor +, no inducer present
 - B) Promoter -, Operator +, Repressor +, no inducer present
 - C) Promoter -, Operator -, Repressor +, inducer present
 - D) Promoter +, Operator +, Repressor -, no inducer present
16. Genomic imprinting is accomplished primarily through:
- A) methylation
 - B) acetylation
 - C) transcription
 - D) cis and trans factor interactions
17. When gene expression is regulated by mechanisms other than the interaction of cis elements and trans factors, the regulation is called:
- A) induction
 - B) epigenetics
 - C) attenuation
 - D) combinatorial control
18. RNA and DNA are structurally similar because they both:
- A) have ribose as their sugar moiety
 - B) consist of a single strand that folds on itself
 - C) consist of two complementary strands
 - D) are polymers of four different nucleotide bases
19. RNA is degraded by:
- A) helicases
 - B) polymerases
 - C) ribonucleases
 - D) methylases

Answer Key

1. C
2. A
3. C
4. D
5. A
6. B
7. C
8. D
9. B
10. E
11. A
12. B
13. A
14. B
15. D
16. A
17. B
18. D
19. C