

Chapter 6
Gene Expression in Eukaryotes

1. Which of the following are feature of eukaryotic gene expression?
(A) Polycistronic mRNAs are very rare
(B) Many genes are interrupted by noncoding DNA sequences
(C) RNA synthesis and protein synthesis are coupled as in prokaryotes
(D) mRNA is often extensively modified before translation

2. In nucleic acid hybridization,
(A) hybridization depends on complementary base pairing
(B) a polysaccharide can hybridize with a DNA strand
(C) a DNA strand can hybridize with another DNA strand
(D) an RNA strand can hybridize with a DNA strand

3. Promoters of eukaryotic mRNA synthesis
(A) are more complex than prokaryotic promoters
(B) can require binding of a single transcription factors to form a transcription complex
(C) have specific DNA sequences such as the "TATA" box that are recognized by proteins
(D) are the stretches of DNA to which RNA polymerase binds to initiate transcription

4. Which of the following are involved in regulating the synthesis of RNA in the eukaryotic nucleus?
(A) active genes in euchromatin, and inactive genes in heterochromatin
(B) amplification of some genes such as rRNA genes
(C) use of different RNA polymerases to transcribe different classes of RNA
(D) spliceosomes that stimulate synthesis of intron-containing hnRNAs

5. Which of the following features would you expect to find in heterogeneous nuclear RNA (hnRNA)?
(A) Intron
(B) Polycistronic coding
(C) Polyadenylation at 3'-end
(D) 5-' cap structure

6. Which of the following are parts of RNA processing in eukaryotes?
(A) Reverse transcription
(B) Addition of a 5' cap
(C) Addition of a poly A tail
(D) Intron removal

7. Which of the following of these are second messenger?
(A) Inositol 1, 4,5-triphosphate
(B) ATP
(C) Ca⁺⁺
(D) cAMP

8. Which combination of the following statements with regard to gene expression are INCORRECT?

- (A) Heteronuclear RNA represents contiguous segment of genomic DNA
 - (B) UTRs are part of heteronuclear RNA but not of mRNA
 - (C) UTRs are part of exons
 - (D) Translation start codon must be in the first exon
9. Which of the following processes occur in prokaryotic gene expression, but do not occur in eukaryotic gene expression?
- (A) Transcription of mRNA, tRNA, and rRNA
 - (B) Binding of RNA polymerase to the promoter
 - (C) Addition of a poly-A tail to the 3' end and the 5' capping of an mRNA
 - (D) Translation begins as soon as transcription is initiated
10. Which of the following statements is/are TRUE about juxtacrine signaling?
- (A) The ligand and the receptor engage in reciprocal signaling
 - (B) Both the ligand and the receptor are membrane associated proteins
 - (C) The ligand gets proteolytically cleaved after binding to the receptor
 - (D) Ligands and receptor cannot associate with protein at the same time

Answer

- 1. (A), (B), (D)
- 2. (A), (C), (D)
- 3. (A), (C), (D)
- 4. (A), (B), (C)
- 5. (A), (C), (D)
- 6. (B), (C), (D)
- 7. (A), (C), (D)
- 8. (B), (C), (D)
- 9. (A), (B), (D)
- 10. (A), (B), (C)