

Comprehension Questions - Module 13: Molecular Biology

DNA Structure and Replication

1. Explain how the structure of DNA enables it to store and transmit genetic information.
2. Describe the process of DNA replication, including the enzymes involved and their functions.
3. Explain how DNA replication ensures accuracy and what happens when errors occur.
4. Compare and contrast the leading and lagging strands in DNA replication.

RNA Structure and Types

1. Compare and contrast the structure and function of DNA and RNA.
2. Describe the different types of RNA (mRNA, tRNA, rRNA) and their roles in protein synthesis.
3. Explain how RNA differs from DNA in structure and function.

Transcription

1. Describe the process of transcription, including initiation, elongation, and termination.
2. Explain how RNA polymerase recognizes where to start transcription.
3. Compare and contrast transcription in prokaryotes and eukaryotes.
4. Describe RNA processing in eukaryotes (capping, splicing, polyadenylation).

Translation

1. Explain how the genetic code translates nucleotide sequences into amino acid sequences.
2. Describe the process of translation, including the roles of mRNA, tRNA, and ribosomes.
3. Explain how the structure of tRNA enables it to carry out its function.
4. Describe the three stages of translation (initiation, elongation, termination).

Gene Expression Regulation

1. Explain how gene expression is regulated at different levels.
2. Describe how operons control gene expression in prokaryotes.
3. Compare and contrast gene regulation in prokaryotes and eukaryotes.