

Dna Transcription And Translation Mcq With Answers

Dna Transcription And Translation Mcq With Answers DNA Transcription and Translation MCQ with Answers The central dogma of molecular biology describes the flow of genetic information from DNA to RNA to protein This process vital for all life is achieved through two key steps transcription and translation Understanding these processes is crucial for comprehending how genes are expressed and how organisms function This article will explore these steps in detail providing a comprehensive overview of DNA transcription and translation followed by a set of multiplechoice questions MCQ with answers to assess your understanding

1 DNA Transcription

11 What is Transcription

Transcription is the process of copying genetic information from DNA into RNA This RNA molecule known as messenger RNA mRNA serves as a template for protein synthesis

12 Key Players in Transcription

DNA The genetic blueprint containing the code for protein synthesis
RNA polymerase An enzyme that reads the DNA sequence and synthesizes a complementary RNA strand
Promoter A specific DNA sequence that signals the start of a gene and allows RNA polymerase to bind
Terminator A DNA sequence that signals the end of a gene and causes RNA polymerase to detach

13 Steps of Transcription

- 1 Initiation** RNA polymerase binds to the promoter and unwinds a small portion of the DNA double helix
- 2 Elongation** RNA polymerase moves along the DNA template strand reading the DNA sequence and adding complementary RNA nucleotides to the growing mRNA molecule
- 3 Termination** When RNA polymerase reaches the terminator sequence it detaches from the DNA and releases the newly synthesized mRNA molecule

2 RNA Processing

21 mRNA Processing

Before mRNA can be translated into protein it undergoes several modifications

- Capping** Addition of a 5 cap to the mRNA molecule protecting it from degradation and facilitating ribosome binding
- Splicing** Removal of noncoding regions introns from the mRNA molecule and joining the coding regions exons together
- Polyadenylation** Addition of a polyA tail to the 3 end of the mRNA molecule providing stability and regulating translation

3 DNA Translation

31 What is Translation

Translation is the process of converting the genetic code carried by mRNA

into a sequence of amino acids which forms a protein

32 Key Players in Translation

mRNA The messenger molecule carrying the genetic code from DNA

Ribosome A molecular machine that reads the mRNA sequence and links amino acids together

tRNA Transfer RNA responsible for carrying specific amino acids to the ribosome based on the mRNA codon

Amino acids The building blocks of proteins

33 Steps of Translation

- 1 Initiation** The ribosome binds to the mRNA molecule and finds the start codon AUG
- 2 Elongation** The ribosome moves along the mRNA molecule reading each codon and adding the corresponding amino acid to the growing polypeptide chain
- 3 Termination** When the ribosome reaches a stop codon UAA UAG UGA the polypeptide chain is released from the ribosome and folds into its final three-dimensional structure
- 4 The Genetic Code** The genetic code is a set of rules that defines how the sequence of nucleotides in DNA or RNA is translated into the sequence of amino acids in a protein. Each codon, a sequence of three nucleotides, codes for a specific amino acid.

5 MCQ on DNA Transcription and Translation

- 1** What is the process of converting DNA into RNA called?
a Translation
b Transcription
c Replication
d Mutation
Answer: b Transcription
- 2** What is the role of RNA polymerase in transcription?
a It binds to the mRNA molecule and initiates translation
b It reads the DNA sequence and synthesizes a complementary RNA strand
c It carries amino acids to the ribosome
d It folds the polypeptide chain into its final structure
Answer: b It reads the DNA sequence and synthesizes a complementary RNA strand
- 3** What is the function of the 5' cap on mRNA?
a It signals the start of a gene
b It protects the mRNA from degradation
c It helps the ribosome bind to the mRNA
d All of the above
Answer: d All of the above
- 4** Which of the following is NOT a stop codon?
a UAA
b UAG
c UGA
d AUG
Answer: d AUG
- 5** What is the role of tRNA in translation?
a It carries amino acids to the ribosome
b It reads the DNA sequence and synthesizes a complementary RNA strand
c It folds the polypeptide chain into its final structure
d It unwinds the DNA double helix
Answer: a It carries amino acids to the ribosome
- 6** What is the function of the ribosome in translation?
a It reads the mRNA sequence and links amino acids together
b It synthesizes a complementary RNA strand
c It carries amino acids to the ribosome
d It folds the polypeptide chain into its final structure
Answer: a It reads the mRNA sequence and links amino acids together
- 7** What is the role of the promoter in transcription?
a It signals the end of a gene
b It binds to the mRNA molecule and initiates translation
c It carries amino acids to the ribosome
d It signals the start of a gene and allows RNA polymerase to bind
Answer: d It signals the start of a gene and allows RNA polymerase to bind
- 8** What is the name of the three-nucleotide sequence in mRNA that codes for a

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