

Try These: Transcription Questions

Questions

1. List and describe the three stages of transcription. K/U
2. If the DNA template strand has the sequence 3'-CAAATTGGCTTATTACCGGATG-5', what would be the sequence of an RNA molecule transcribed from it? T/I
3. Explain the role of each of the following in transcription. K/U
 - (a) promoter
 - (b) RNA polymerase
 - (c) spliceosomes
4. Differentiate between introns and exons. K/U
 5. What are the key differences between transcription in eukaryotes and prokaryotes? K/U
6. Compare and contrast DNA replication and transcription. How are they similar? How are they different? Present your answer in table form. T/I C
7. How is it possible for an organism to produce more proteins than it has genes for? K/U
 8. As a graduate student in a university laboratory, you have been challenged with the problem of determining whether a sample of mRNA is from a eukaryotic cell or a prokaryotic cell. You have been provided with a nucleotide sequencer, which will help you determine the DNA sequence. What features in the sequence will you look for to determine whether the mRNA is eukaryotic or prokaryotic? T/I

9. Suppose that you are provided with a sample of eukaryotic DNA. You divide the sample into three separate reaction mixtures and perform an experiment. Once transcription is complete, you analyze the base composition of mRNA from each mixture. You obtain the results in **Table 2**. Based on these results, answer the questions below. T/I

Table 2 Experimental Results

	A	G	C	T	U
DNA Strand I	19.1	26.0	31.0	23.9	0
DNA Strand II	24.2	30.8	25.7	19.3	0
mRNA Strand A	19.7	25.9	30.8	0	24.0
mRNA Strand B	24.1	30.9	25.9	0	19.0

- (a) Which strand of DNA served as the template for the synthesis of mRNA strand A? Which strand served as the template for the synthesis of mRNA strand B? Explain your reasoning.
 - (b) Explain why the percentage of adenine is higher in the mRNA strands than in the DNA strands.
10. How does the absence of a nucleus in prokaryotes prevent prokaryotes from controlling gene expression by modifying RNA after transcription? T/I