

## Terms &amp; Guide Questions for Topic: Basic Transcription

*Terms*

Gene	TBP (TATA-binding protein)
Transcription vs. Translation	TAFs (TBP-associated factors)
mRNA vs. tRNA vs. rRNA	Mediator
Prok. RNA polymerase, core polymerase, $\sigma$ subunit	RNA polymerase CTD
Euk. RNA polymerase II	Terminator
Transcription start site	mRNA processing
Promoter	5' cap
-10 & -13 elements	Poly-A site & 3' poly-A tail
Eukaryotic core promoter elements	Splicing, introns, & exons
TATA box	snRNPs, 5' splice site, & 3' splice site
General transcription factors	Alternative splicing

*Guide Questions*

1. TRUE or FALSE: All genes code for proteins.
2. What do RNA polymerase and DNA polymerase have in common?
3. How do RNA polymerase and DNA polymerase differ?
4. During transcription, the \_\_\_\_\_ strand is used as a template to direct the synthesis of a poly-RNA molecule, whereas the \_\_\_\_\_ strand is composed of an identical sequence to the poly-RNA molecule.
5. What role do promoters play in transcription of genes?
6. Two essential features of promoters that enable them to carry out their function during transcription are that they must be located \_\_\_\_\_ and they must contain \_\_\_\_\_.
7. The location in a gene where RNA synthesis begins is called the \_\_\_\_\_.
8. What do the terms “-35 element” and “-10 element” refer to within the context of *E. coli* genes? How do they contribute prokaryotic gene expression?
9. Subunits  $\alpha$ ,  $\beta$ ,  $\beta'$ , and  $\omega$  of the *E. coli* RNA polymerase constitute the “core polymerase”, which is carries out \_\_\_\_\_ during transcription. The  $\sigma$  subunit, on the other hand, is also critical because it \_\_\_\_\_.

10. What does the term “core promoter elements” refer to?
11. What do *E. coli* and eukaryotic gene promoters have in common? How do they differ?
12. What role do the General Transcription Factors play in eukaryotic gene expression?
13. Why is the protein TBP (TATA-binding protein) named as such?
14. If RNA polymerase II acquired a mutation that prevented it from forming protein-protein interactions with the General Transcription Factors, how would that impact transcription of genes?
15. Why is helicase activity critical for transcription of genes?
16. Which of the following statements is/are true of the RNA polymerase II CTD (carboxy terminal domain)?
17. During transcription, what causes RNA polymerase to stop transcribing at the end of a gene?
18. During mRNA processing, the term “5’ capping” refers to \_\_\_\_\_.
19. What does the term “polyA site” refer to?
20. What role does poly-A polymerase play in cells?
21. Which of the following distinguishes exons and introns?
22. Exons and introns have which of the following in common?
23. During splicing, \_\_\_\_\_ are excised from a \_\_\_\_\_ and \_\_\_\_\_ are ligated to each other, resulting in a \_\_\_\_\_.
24. What are snRNPs?
25. What role(s) do snRNAs play within snRNPs?
26. What does the term “alternative splicing” refer to?