

Supplemental Instruction – Biology 2300

SI Leader – Philipp Orbe

Session: 6 – Transcription

1. Transcription is the process in which _____ polymerase uses one strand of _____ as a template to synthesize a complementary RNA sequence.

- a. DNA; RNA
- b. DNA; DNA
- c. RNA; DNA
- d. RNA; RNA

2. True or False: A cell can express different genes and translate mRNA at different rates.

- a. What does this allow cells to do?

3. The _____ is the entire mRNA content of the cell.

- Can its composition change over time? Why might it change?

4. What are some differences between DNA and RNA, what unique qualities does each nucleic acid possess.

5. What quality of RNA allows it to form intramolecular base-pairs (with itself).

6. True or False: The coding strand is identical to the RNA product. Why or why not?

7. What similarities do DNA and RNA polymerase have, as well as what differences?

8. True or False: Synthesis of the next RNA strand often occurs before the synthesis of the first strand is completed.

9. List the three main steps of transcription:

10. _____: a specific DNA sequence in DNA located near the start of a gene that is the binding site for RNA polymerase and the place where transcription starts.

11. How does RNA polymerase know where to start transcription?
 - a) Origin of transcription

- b) Promotor region
- c) Hormone release
- d) RNA primase

12. In bacteria, RNA polymerase has a subunit for recognizing the promoter sequence of a gene, what is the subunit?

13. True or False: Promoters and terminators work to orient RNA polymerase in one direction, only occurs in prokaryotes.

14. RNA transcripts can be made from both/one strands of DNA. A specific gene is only transcribed off both/one strand.

15. _____: a nucleotide sequence that represents an “average” of a number of a related but non-identical sequence.

16. Initiation of transcription: Prokaryotes

The picture to the right depicts RNA polymerase binding to the promoter at two sequences

separated by 25 bp. Bacterial promoter recognition

relies on one factor not shown here. What is it?

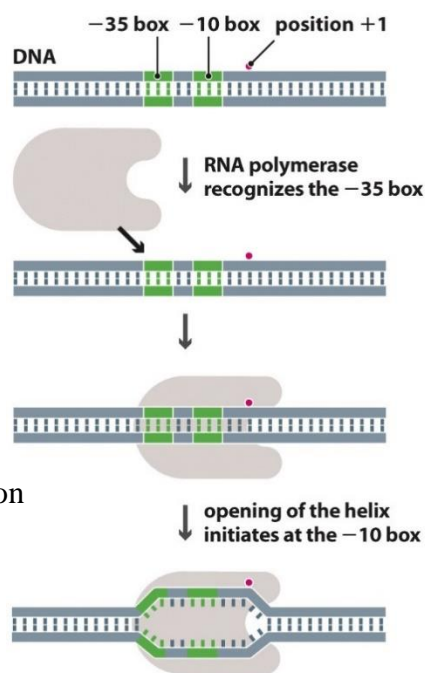


Figure 4.18 Introduction to Genetics (© Garland Science 2012)

17. Eukaryotic RNA polymerase requires general transcription factors to create a _____.

_____.

a. This complex includes:

18. _____, _____, and _____ recruit RNA polymerase II to the TATA box of the promoter.

19. RNA polymerase II is then released

from the complex after being

phosphorylated by _____.

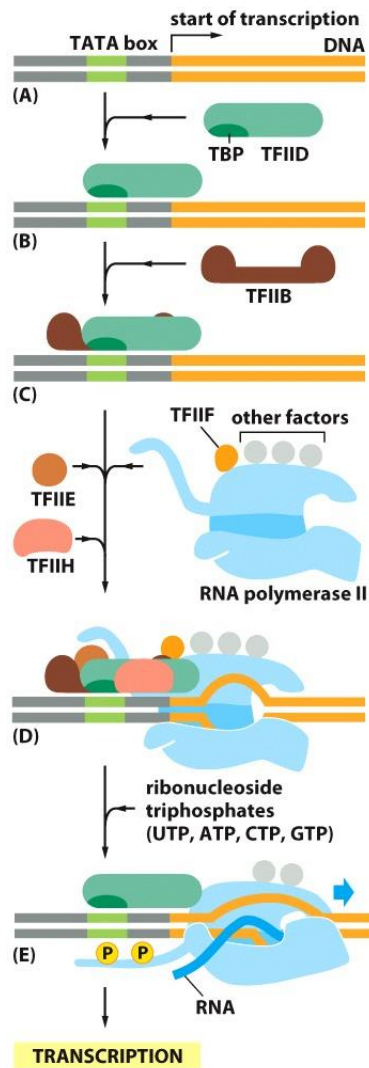


Figure 7-12 Essential Cell Biology, 4th ed. (© Garland Science 2014)

20. What are some differences between prokaryotic and eukaryotic transcription?