

Name \_\_\_\_\_

**AP Biology**

**TEXT: *Biology*, Campbell and Reece**

**7<sup>th</sup> Edition**

**Chapter 17**

**Gene to Protein  
Thematic Review Guide**

1. How did diseases involving metabolic pathways lead to hypotheses about the nature of genes?

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2. Identify some genetic diseases that occur along metabolic pathways.

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3. What was Beadle and Tatum's hypothesis regarding enzymes?

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4. How has that hypothesis been modified?

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5. What occurs during transcription?

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6. What occurs during translation?

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7. How does the protein process differ in prokaryotes and eukaryotes?

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8. Briefly explain how Marshall Nirenberg and Heinrich Matthaei “cracked the genetic code?”

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9. What is the genetic code and why is said to be universal?

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10. List several features about the genetic code.

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11. Give an example of what happens if reading frames are altered?

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12. List the highlights of the three stages of transcription.

a. Initiation \_\_\_\_\_

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b. Elongation \_\_\_\_\_

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c. Termination \_\_\_\_\_

13. What happens to the transcript RNA before it leaves the nucleus?

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14. What is the advantage of the 5' cap and poly A tail?

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15. Distinguish between exons and introns.

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16. Describe the mechanism for splicing RNA.

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17. What does alternative RNA processing do for cells?

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18. Identify the roles of the players of the translation process.

a. Transfer RNA \_\_\_\_\_

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b. Aminoacyl-tRNA synthetase \_\_\_\_\_

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c. Ribosomes \_\_\_\_\_

19. Identify and briefly describe the steps of translation. Initiation Elongation Termination

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20. What is the advantage of polyribosomes?

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21. Give an example of how a polypeptide gets into the ER for additional processing.

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22. How does protein synthesis differ between prokaryotes and eukaryotes?

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23. Define point mutations.

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24. Define mutations that are:

a. Missense

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b. Nonsense

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c. Insertion or deletion

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