Name _____ Period _____

Date _____

AP: CHAPTER 17: FROM GENE TO PROTEIN

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

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

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

4. How has that hypothesis been modified?

5. What occurs during transcription?

6. What occurs during translation?

Name _____

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

_____

_____

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

_____

_____

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

_____

_____

10. List several features about the genetic code.

_____

_____

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

_____

_____

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

a. Initiation _____

_____

b. Elongation _____

_____

c. Termination _____

Name _____

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

_____

_____

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

_____

_____

15. Distinguish between exons and introns.

_____

_____

16. Describe the mechanism for splicing RNA.

_____

_____

17. What does alternative RNA processing do for cells?

_____

_____

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

a. Transfer RNA _____

_____

b. Aminoacyl-tRNA synthetase _____

_____

c. Ribosomes _____

Name _____

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

_____

_____

20. What is the advantage of polyribosomes?

_____

_____

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

_____

_____

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

_____

_____

23. Define point mutations. _____

_____

24. Define mutations that are:

a. Missense _____

_____

b. Nonsense _____

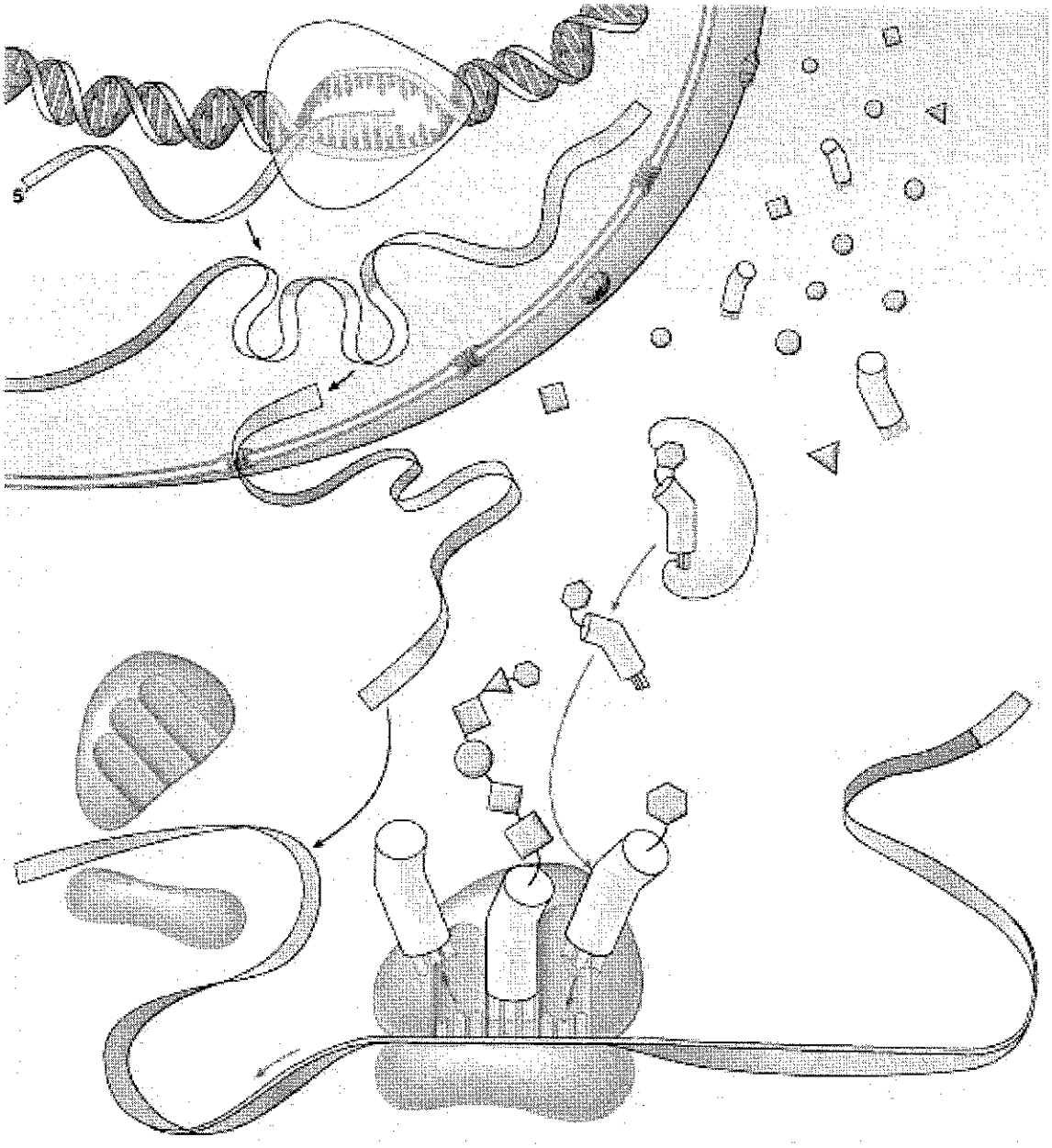
_____

c. Insertion or deletion _____

_____

Name _____

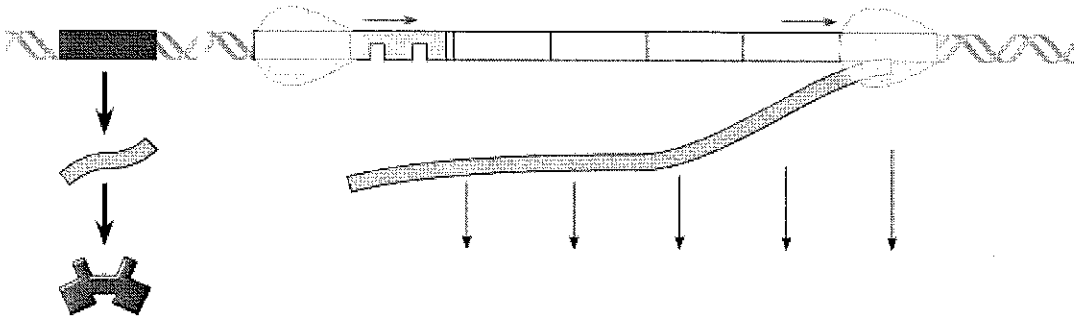
25. Use the diagram to trace the flow of chemical information from the gene to the protein product.



CH 18 pgs. 347-351

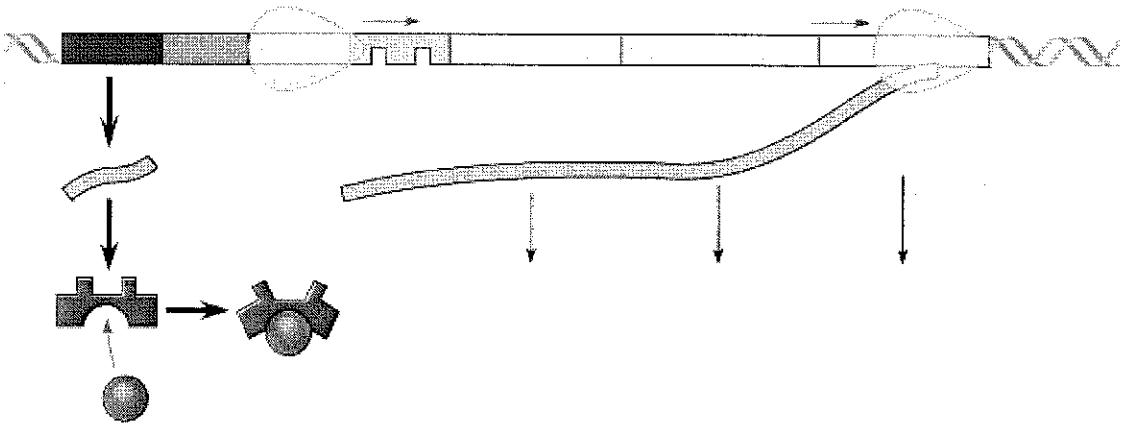
Name _____

25. Use the diagram of the Tryp operon to outline how it regulated tryptophan levels.



26. Describe how the trp operon is a repressible operon.

27. Use the diagram of the lac operon to outline how it regulates glucose levels.



Name _____

28. Does the diagram above represent the condition for the absence or presence of lactose?

_____

_____

29. Describe what happens when lactose is absent.

_____

_____

30. How is the lac operon an inducible system?

_____

_____

31. Summarize how the presence and absence of glucose influences the lac operon.

_____

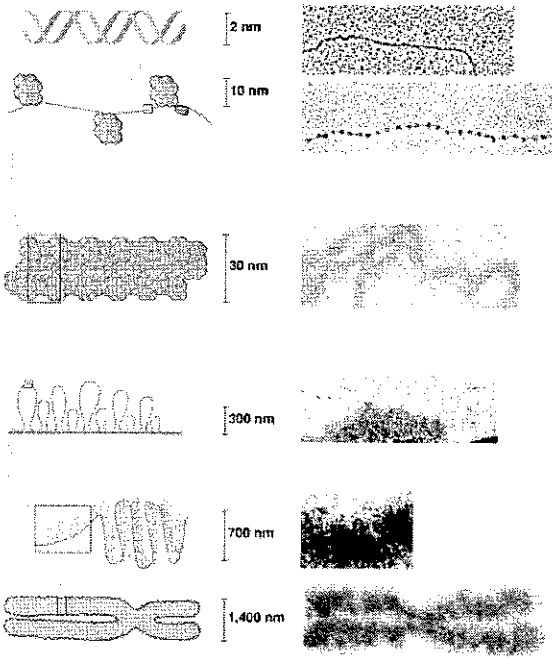
_____

Name _____ Period _____

Date _____

AP: CHAPTER 19: CONTROL OF EUKARYOTIC GENOME

1. Outline the levels of DNA packing within the eukaryote nucleus.



2. What is the difference between heterochromatin and euchromatin? Which is transcribed?

_____

_____

3. Which regions of the chromosome will typically be in the form of hererochromatin?

_____

_____

4. How do the coding regions and genome sizes of prokaryotes and eukaryotes compare?

_____

_____

Name _____

5. Much of mammalian non-coding DNA is in the form of _____

6. What is the cause of Fragile X?

_____

_____

7. What is the cause of Huntington's disease?

_____

_____

8. Discuss an example of interspersed repetitive DNA?

_____

_____

9. What is a multigene family?

_____

_____

10. Multigene families are hypothesized to have evolved from...

_____

_____

11. How is the globulin multigene family an adaptive to mammals?

_____

_____

Name _____

12. Explain how gene amplification can regulate gene expression.

_____

_____

13. How can transposons alter gene expression?

_____

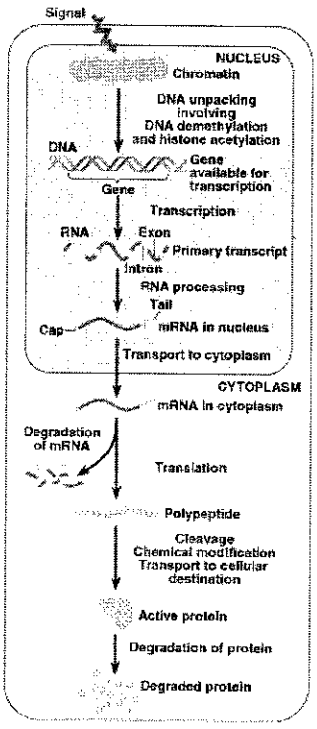
_____

14. How do immunoglobulin genes code for a seemingly infinite variety of antibodies?

_____

_____

15. Review the opportunities for gene regulation in eukaryotes in the diagram.



16. Where is the most important step in gene regulation?

_____

_____

Name _____

17. Describe the effect of each of the following control mechanisms.

    a. DNA methylation _____

    b. Histone acetylation _____

    c. Transcription factors _____

    d. Control elements _____

    e. Enhancers _____

    f. Activators _____

    g. DNA-binding domain _____

18. How does alternative RNA splicing affect gene expression?

    _____

    _____

19. How does RNA degradation affect gene expression?

    _____

    _____

    _____

20. How does protein processing and degradation affect gene expression?

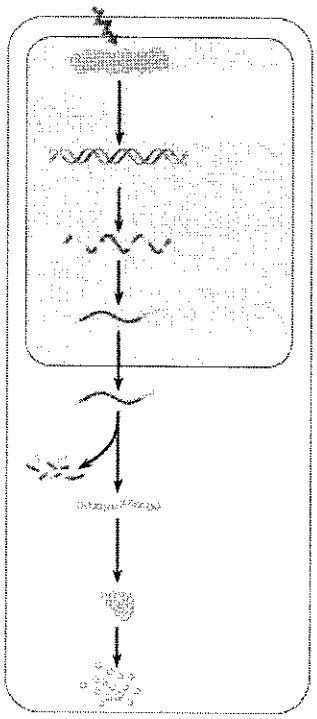
    _____

    _____

    _____

Name _____

21. Identify the opportunities to regulate gene expression in eukaryotes.



22. Typically, what happens to cell function when cells become cancerous?

_____

_____

23. What is a proto-oncogene? What happens to them when cancer occurs?

_____

_____

_____

24. List the three events that can turn proto-oncogenes into oncogenes.

_____

_____

_____

Name _____

25. Identify and describe mutations in specific proteins that can lead to cancer.

_____

_____

_____

26. What is p53?

_____

_____

_____

27. Why is it said that cancer formation is a multi-step process?

_____

_____

_____