

CHAPTER 13.1—13.5: DNA and its Role in Heredity

1. After Morgan and fellow scientists developed the Chromosomal Theory of Inheritance, the search was on for the chemical mechanism of inheritance. What are the two components of the chromosome?

2. From initial logic, which component would be the most likely candidate for the genetic material? **Why?**

3. What did Griffith accomplish with bacteria?

4. What did Avery, MacLeod and McCarty accomplish with bacteria?

5. Define transformation.

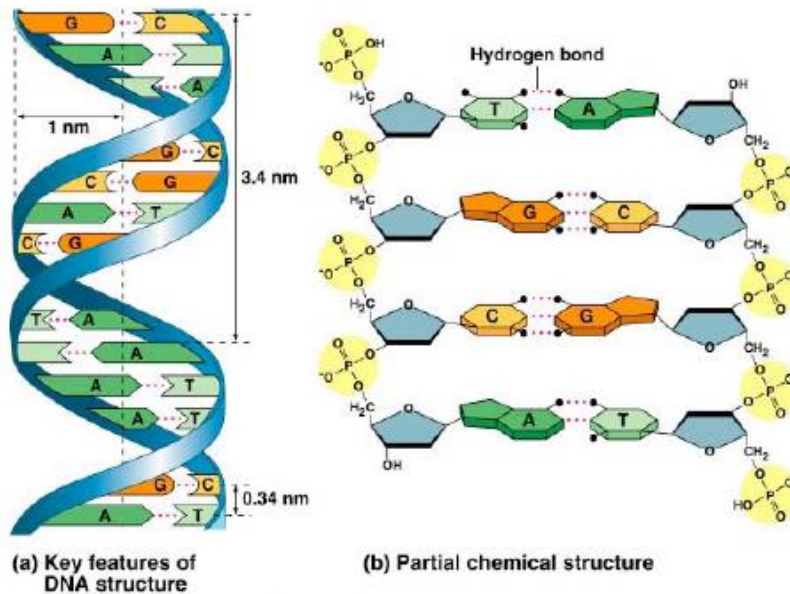
6. What did the experiments done by Alfred Hershey and Martha Chase show?

7. What are Chargaff's rules?

8. If a species has 35% adenine in its DNA, determine the percent of the other three bases.

9. What was the role of Maurice Wilkins and Rosalind Franklin in determining the structure of DNA?

10. Use the diagram to describe the structure of DNA. Include several comments.



11. What is the advantage of the double stranded aspect of the DNA?

12. Which model of DNA replication did Meselson-Stahl show is the most accurate representation of how DNA is actually copied. **Describe** this model.

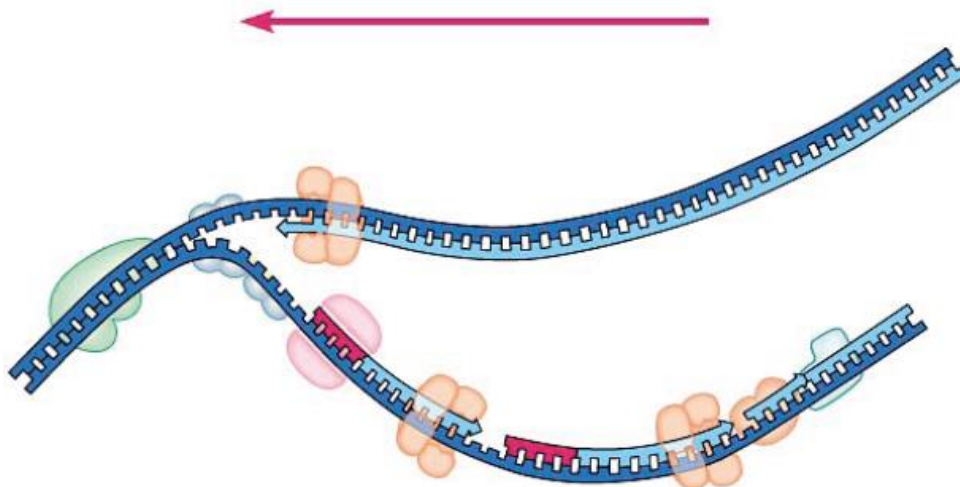
13. What enzymes work at the replication fork?

14. Make a list of the enzymes/proteins involved in replication and their role.

- a. _____ - _____
- b. _____ - _____
- c. _____ - _____
- d. _____ - _____
- e. _____ - _____
- f. _____ - _____
- g. _____ - _____

15. Why does the DNA have to add nucleotides in the 5' to 3' direction?

16. Label the diagram of DNA replication. Include the directions or replication and the terms.
(use the similar diagram on page 273 – Fig. 13.3)



Name: _____

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17. What is the problem that occurs at the ends of the chromosome during replication?

18. What is a telomere and its role in cell division.

19. Why is telomerase an active area in cancer research?

20. **Identify** and **describe** the three basic steps of PCR.

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- _____

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