

Chapter 6

DNA replication, repair and recombination

This is essential to understand

- cancer
- genetic change
- evolution
- key techniques used for molecular biology/ biotechnology
- current antiviral therapeutics

Objectives

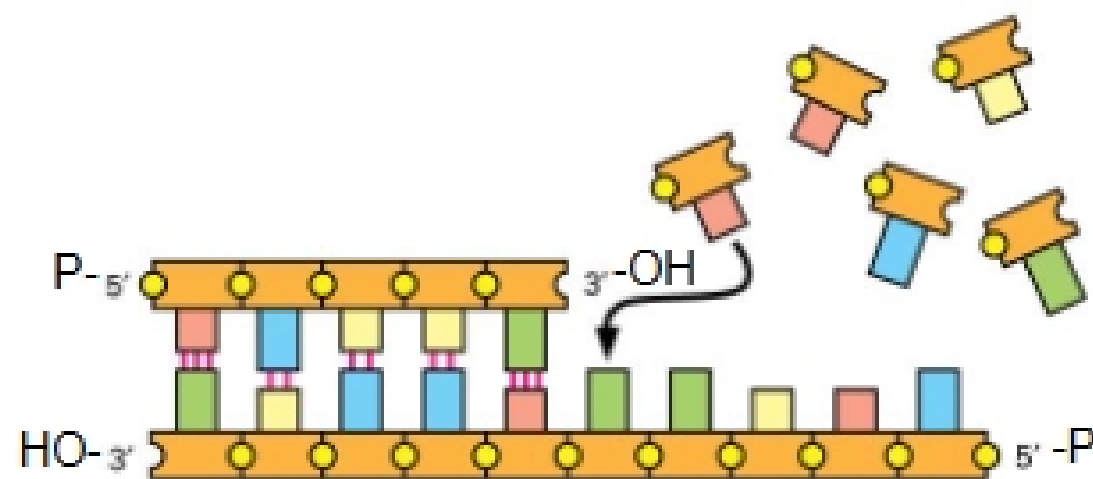
- Be able to explain how genetic information is replicated and the role of the proteins involved
- Understand the general mechanisms of DNA alteration and repair

Be able to:

- Explain the first experiment that showed that DNA replication is semi-conservative
- Draw a piece of DNA, labeling the 5' and 3' ends of each strand
- Draw the DNA opened up for replication, with the RNA primers attached, and label the 5' and 3' ends of the RNA primers
- Draw the new leading strand
- Draw the next RNA primers, labeling the 5' and 3' ends
- Draw the DNA being made on the lagging strand
- Describe how the RNA primer is removed, and explain how ligase seals the gap
- Name, and describe the function of, the key enzymes in replication
- Describe what telomerase does
- Sketch two mechanisms of DNA repair
- Outline what recombination does
- Describe what a transposon is, and how it can copy itself
- Sketch the molecular mechanism used by a retrovirus
- Describe how acyclovir and AZT work

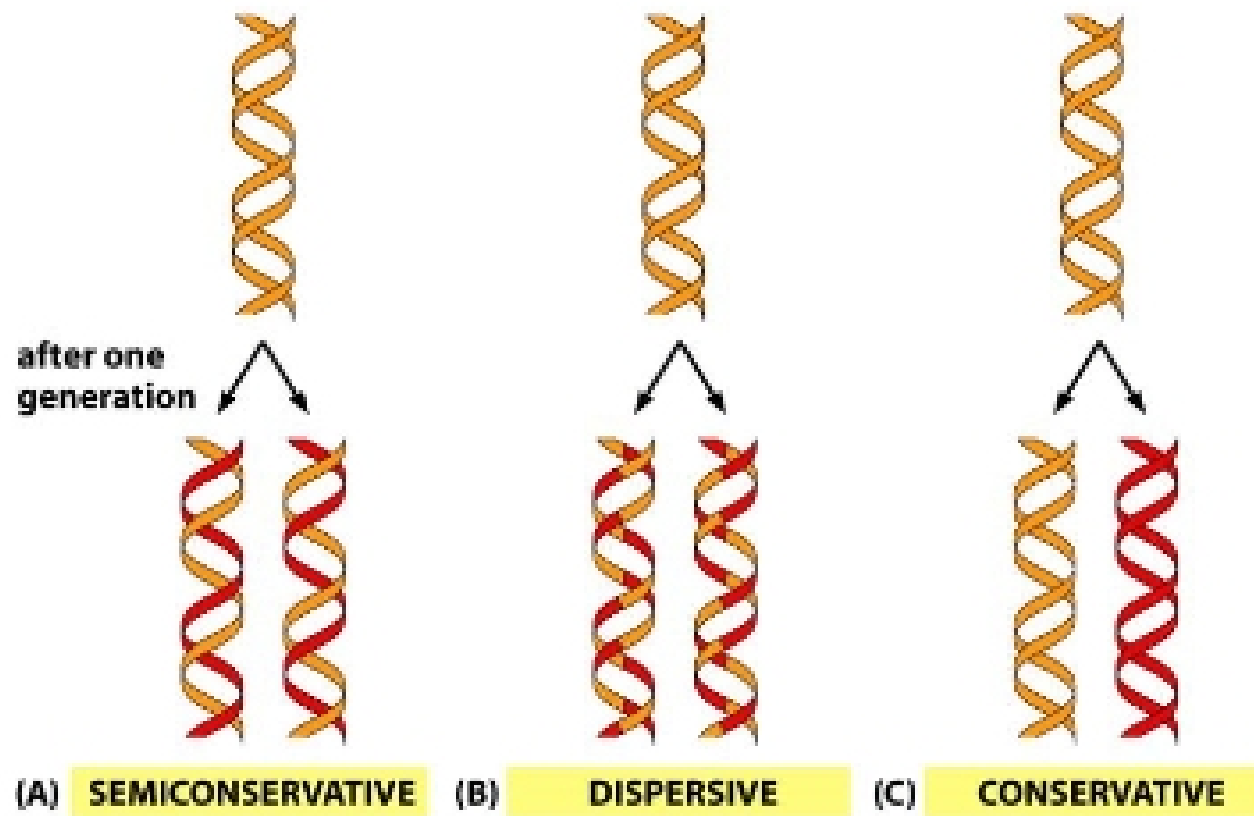
DNA Replication

Each DNA strand can serve as a template for the synthesis of a new complementary strand



A-T and G-C complementary bases

How is DNA replicated?



Meselson-Stahl Experiment DNA replication is semiconservative

