**Today:**

1. **Finish presentation of biotechniques from yesterday's lecture.**

2. **Finish DNA replication of the chromosomal ends (telomeres).**

3. **Finally cover DNA mutations!**

4. **Introduction of the cell cycle.**

# Consequences of Mutational Alterations

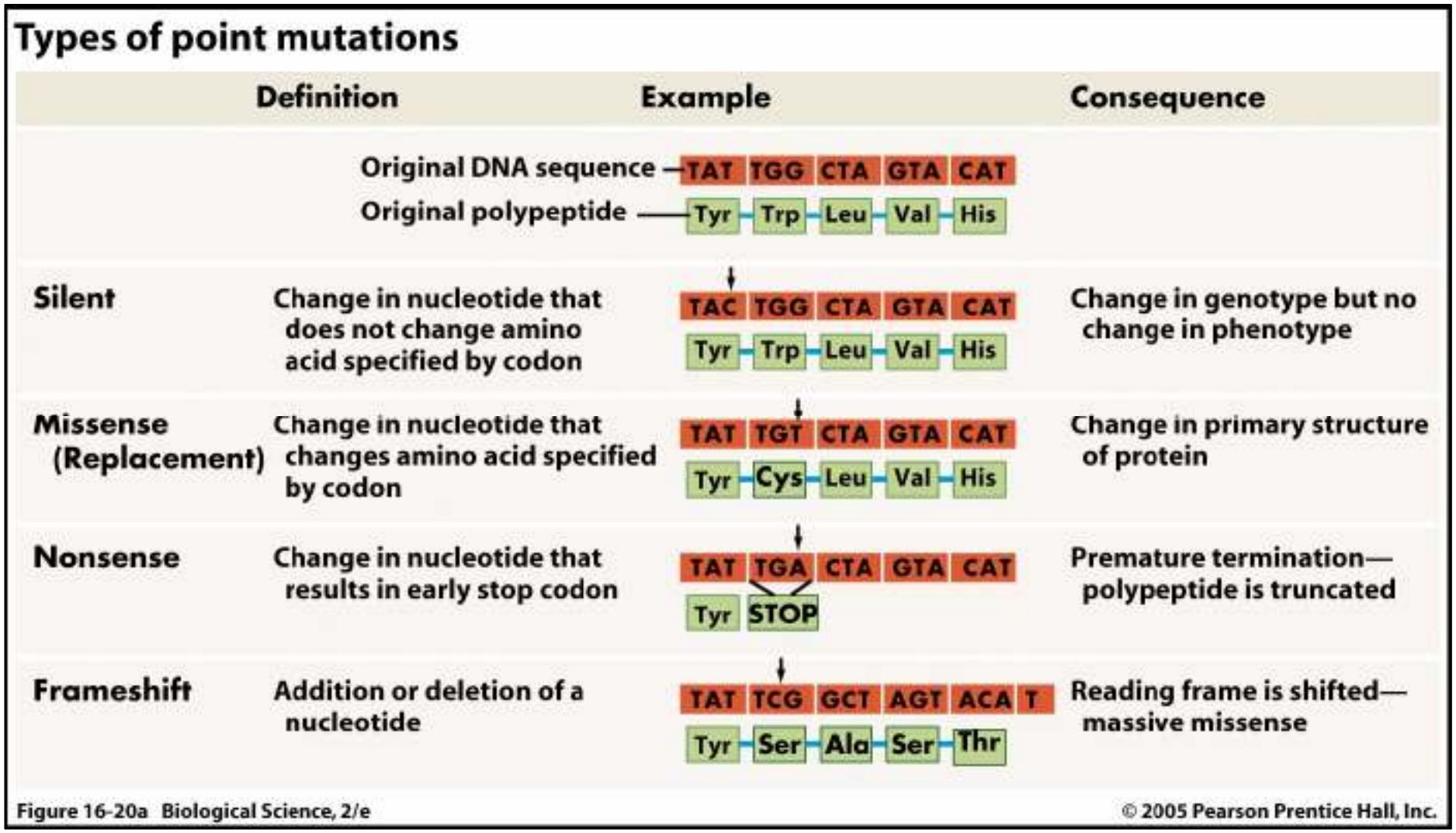



Figure 16-20a Biological Science, 2/e

# MUTATIONS

## Point Mutations Occur During DNA Synthesis

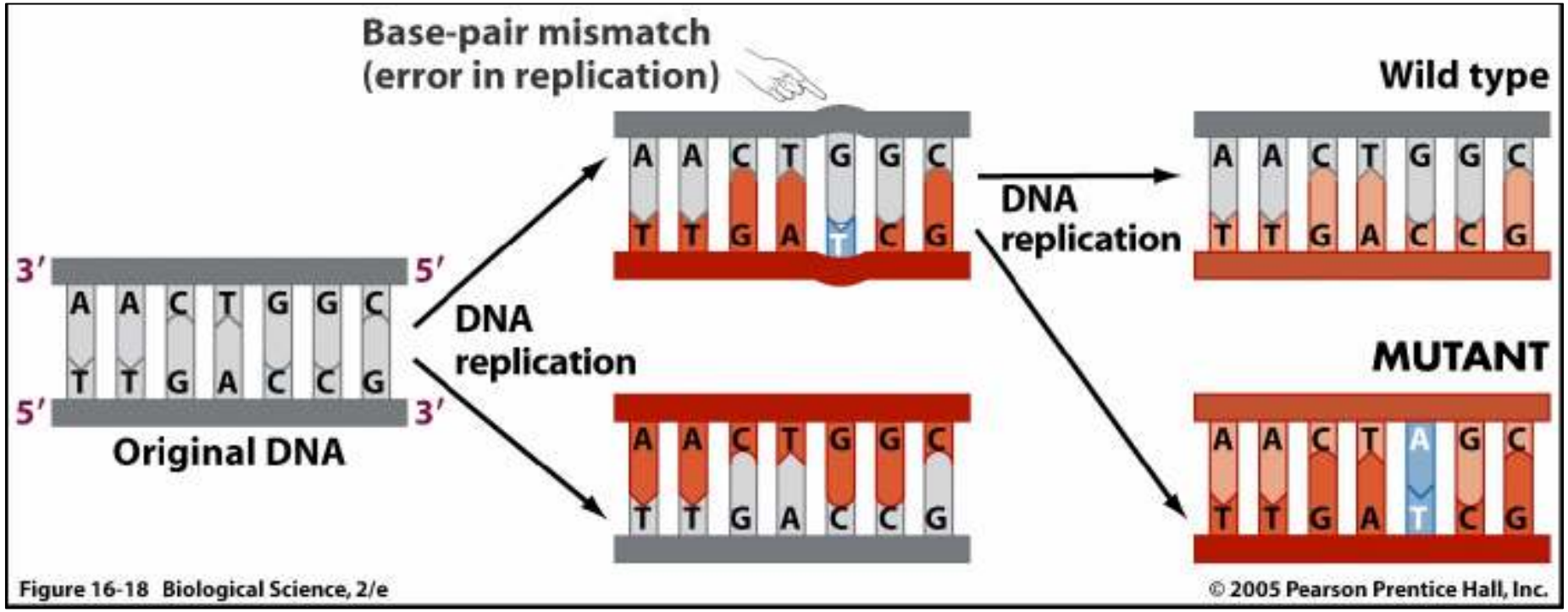


Figure 16-18 Biological Science, 2/e

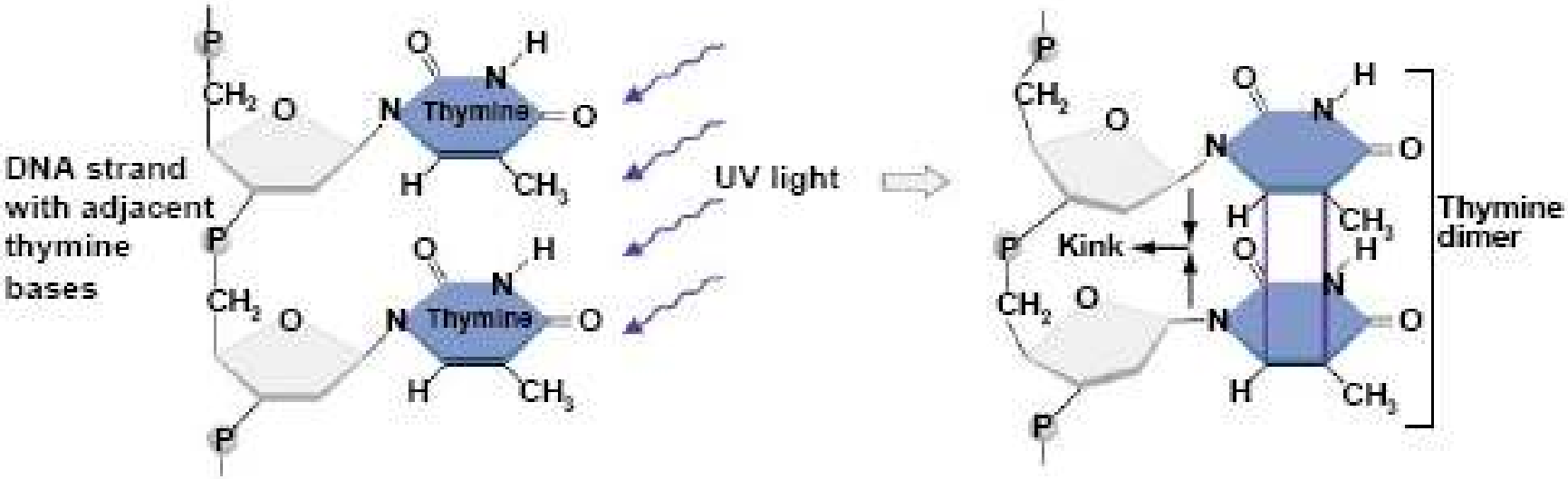


**DNA Polymerases have proof-reading ability and can fix these.**

# Mutagens cause other kinds of mutations

## Radiation

**eg., UV radiation causes thymine crosslinking**

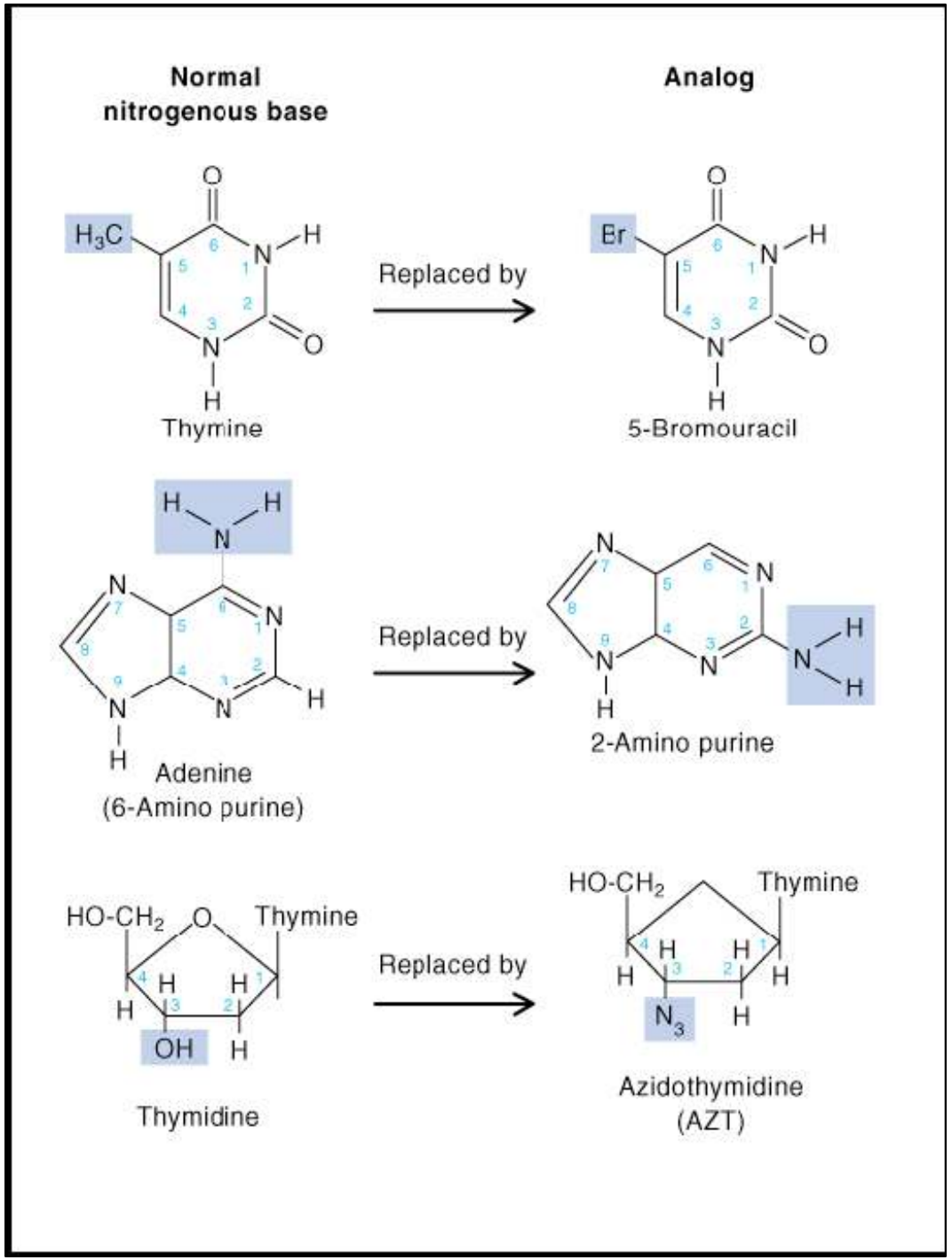


## Chemical Mutagens

- Modifying agents

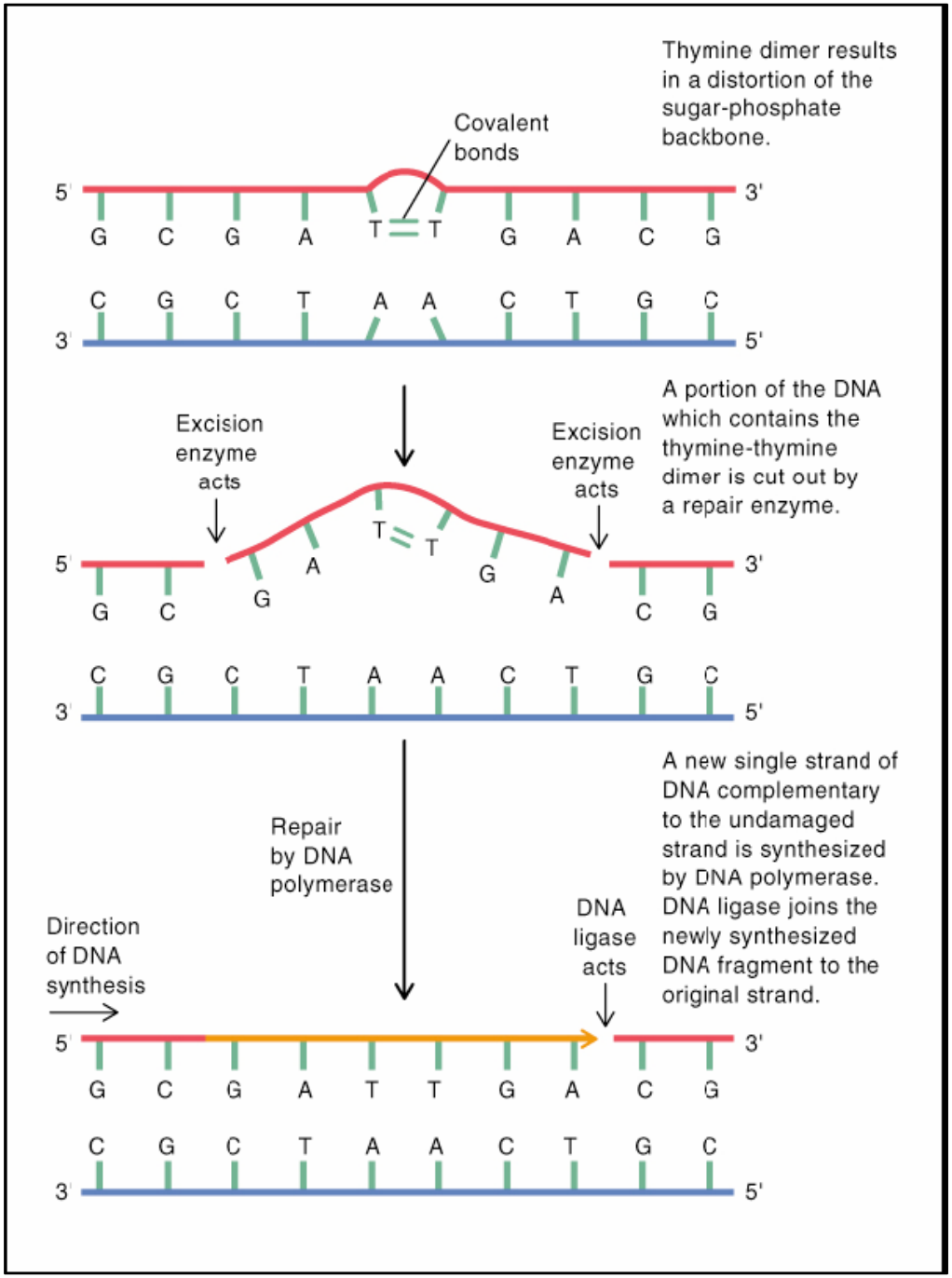
- Base analogs

- Intercalating agents (ethidium bromide)

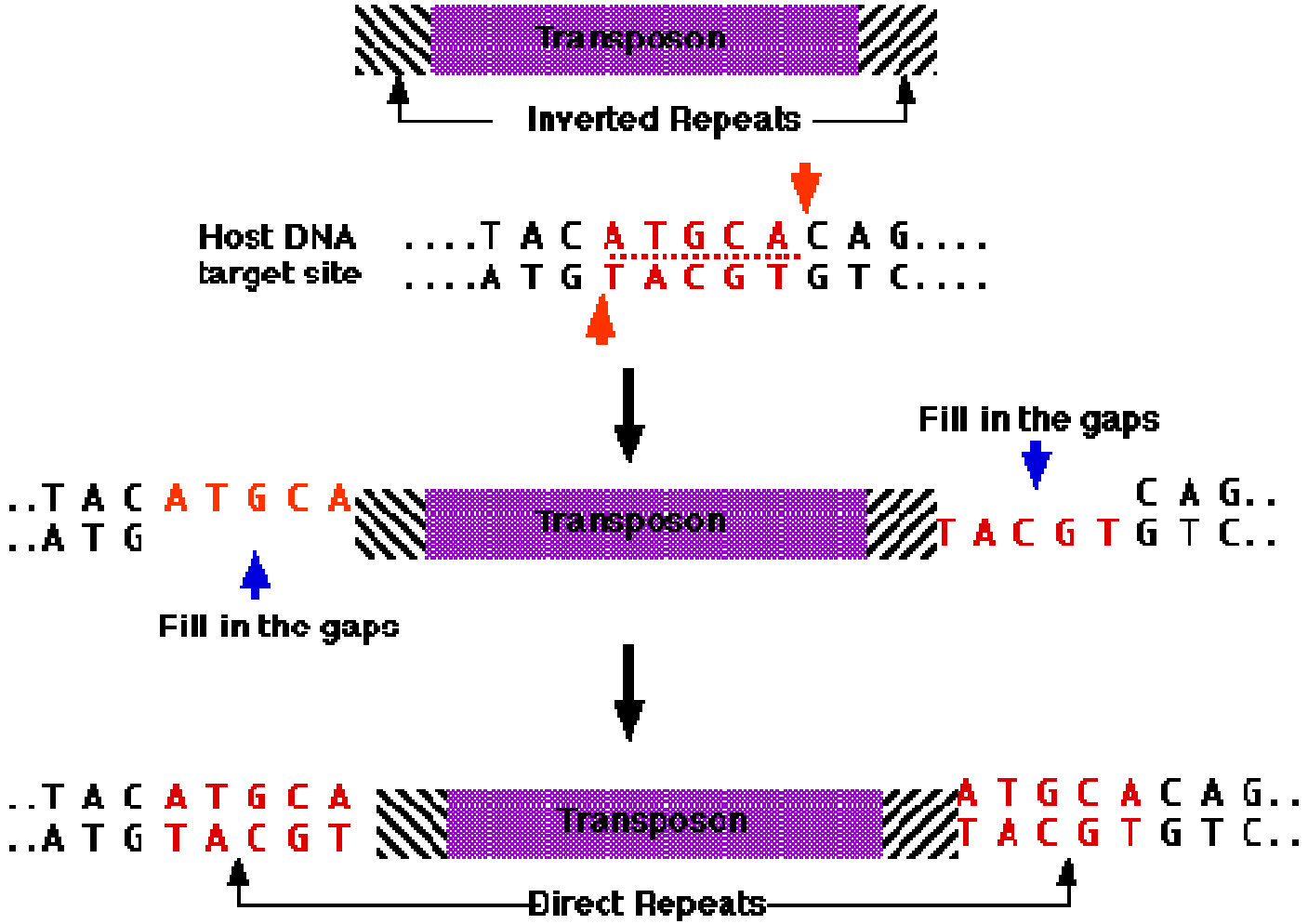


**Mutations of these kind can be fixed by excision repair**

**Proteins recognize kink in DNA and cut out the damaged section so that DNA polymerase and ligase can fix it.**



# Biological Mutagens
# Transposable Elements “Jumping Genes”



# Other Types of Mutations

## Other types of mutations

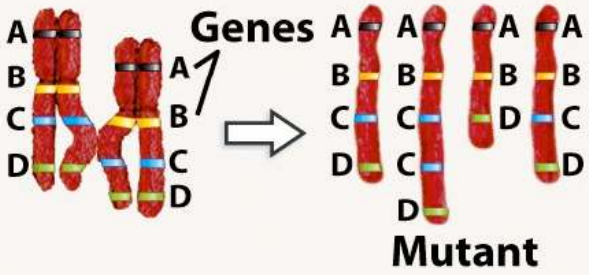
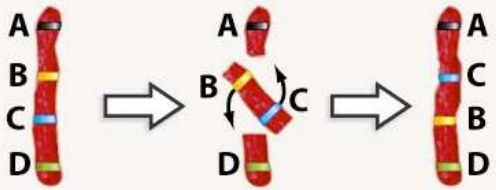
| | Definition | Example | Consequence |
|---|---|---|---|
| **Gene duplication** | Addition of a small chromosome segment due to an error during crossing over at meiosis I—homologs do not align correctly |   | Produces an extra copy or deletion of one or more genes. Families of related genes arise by gene duplication. |
| **Chromosome inversion** | Change in a chromosome segment when DNA breaks in two places, flips, and rejoins |   | Changes gene order along chromosome. Other types of chromosome breaks can lead to deletion or addition of chromosome segments. |

Figure 16-20b Biological Science, 2/e