Replication of DNA
Section 2

DNA Replication

Key Idea: In DNA replication, the DNA molecule unwinds, and the two sides split. Then, new bases are added to each side until two identical sequences result.

- DNA replication is the process of making a copy of DNA.

DNA Replication

- Each double-stranded DNA helix is made of one new strand of DNA and one original strand of DNA.

Replication Proteins

Key Idea: During the replication of DNA, many **proteins** form a machinelike complex of moving parts.

- A DNA helicase is a protein that unwinds the DNA double helix during DNA replication.
- A DNA polymerase is a protein that catalyzes the formation of the DNA molecule by moving along each strand and adding nucleotides that pair with each base.

DNA Helicase

- These enzymes wedge themselves between the two strands of the double helix and break the hydrogen bonds between the base pairs.

DNA Polymerase

- DNA polymerases also have a "proofreading" function.
- The DNA polymerase can backtrack, remove the incorrect nucleotide, and replace it with the correct one.

Prokaryotic and Eukaryotic Replication

Key Idea: In prokaryotic cells, replication starts at a single site. In eukaryotic cells, replication starts at many sites along the chromosome.

- The word distinct means distinguished as not being the same.

Prokaryotic DNA Replication

- Replication in prokaryotes begins at one place along the loop.
- Replication occurs in opposite directions until the forks meet on the opposite side of the loop.

Eukaryotic DNA Replication

- Replication starts at many sites along the chromosome. This process allows eukaryotic cells to replicate their DNA faster than prokaryotes.