Genetic Information Transfer

Central dogma

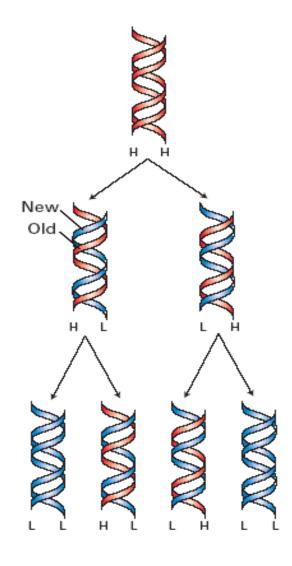
replication transcription translation

RNA protein

reverse transcription

- Replication: synthesis of daughter DNA from parental DNA
- Transcription: synthesis of RNA using DNA as the template
- Translation: protein synthesis using mRNA molecules as the template
- Reverse transcription: synthesis of DNA using RNA as the template

DNA Replication

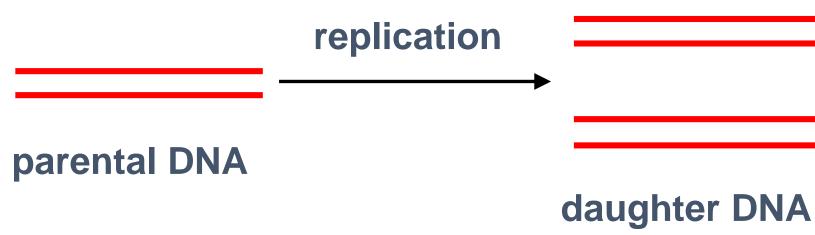


Section 1

General Concepts of DNA Replication

DNA replication

- A reaction in which daughter DNAs are synthesized using the parental DNAs as the template.
- Transferring the genetic information to the descendant generation with a high fidelity



Daughter strand synthesis

Chemical formulation:

$$(dNMP)_n + dNTP \longrightarrow (dNMP)_{n+1} + PPi$$

DNA strand substrate elongated

DNA strand

 The nature of DNA replication is a series of 3' - 5' phosphodiester bond formation catalyzed by a group of enzymes.

The DNA backbone

- Putting the DNA backbone together
 - refer to the 3' and 5' ends of the DNA

