

# DNA Replication

Biochem-501

MSc.II

Dr.Mamta Rathore

Teaching Associates

Department of Agriculture Biochemistry

- **DNA is made up of subunits called NUCLEOTIDES** or  
 ☐ each nucleotide is made up of 3 basic parts:
  - \* 5-carbon sugar: deoxyribose
  - \* nitrogenous base: A, G, C, or T
  - \* 1 phosphate group
- **a) DNA is a helix with a width of 2 nm**  
 Watson and Crick Calculations based on Franklin's work
  - a) DNA is a helix with a width of 2 nm
  - b) purine & pyrimidine bases are stacked 0.34 nm apart
  - c) the helix makes 1 full turn every 3.4 nm along its length
  - d) there are 10 layers of bases (or rungs) in each turn of the helix.

- DNA Replication-The parent molecule has two complementary strands of DNA. Each base is paired by hydrogen bonding with its specific partner, A with T and G with C. The first step in replication is separation of the two DNA strands. Each parental strand now serves as a template that determines the order of nucleotides along a new, complementary strand .“ The Beauty of the model was that the structure of DNA suggested the basic mechanism of its replication”

- Nucleotides line up singly along the template strand (A-T, G-C) (new hydrogen bonds form)
- Enzymes link the nucleotides together at their sugar-phosphate groups (phosphodiester bonds).
- Watson and Crick's proposed model is a SEMICONSERVATIVE MODEL (each of the 2 daughter molecules will have 1 old or CONSERVED strand from the parent molecule and 1 newly created strand).

# **DNA replication begins at special sites called ORIGINS OF REPLICATION**

- -DNA double helix opens at the origin & replication “forks” spread in both directions away from the central initiation site creating a REPLICATION BUBBLE. 's to 1000's of Replication origins form in eukaryotic chromosomes, which eventually fuse forming 2 continuous DNA molecules

- Thanks