

# A special lecture on DNA replication process

- ❖ A process by which DNA can make exact copies of itself.
- ❖ Replication takes place during the interphase (S-phase).
- ❖ Matthew Meselson and Franklin Stahl demonstrated that the chromosome of *Escherichia coli* replicates semi-conservatively.
- ❖ In this case, newly synthesized daughter strands remain associated with their respective parental template strands.
- ❖ Replication of DNA occurs during normal cell division cycles.
- ❖ This process is complex and involves multiple enzymatic activities.

❖ Replication starts on a specific site called origin of replication (ori c).

Initiation protein wrap the DNA at ori -c site.

Strands separation begins.

Replication bubble formed.

DNA helicase and Dna C proteins (six molecules) joins the initiation complex.

Two bidirectional replication forks formed.

DNA helicase denatures the DNA into single strands.

SSB proteins bind to the single stranded DNA and stabilized it.

Gyrase enzyme relaxed the supercoiled DNA.

# PROCESS OF DNA REPLICATION

- ❖ Synthesis of DNA involves three steps-I) chain initiation (II) chain extension (III) chain termination.
- ❖ In E.coli three enzymes –DNA polymerase I, DNA polymerase II and DNA polymerase III catalyzed DNA replication.
- ❖ In Eukaryotes, 5 distinct DNA polymerase identified. These are alpha, beta, gama, delta and epsilon.