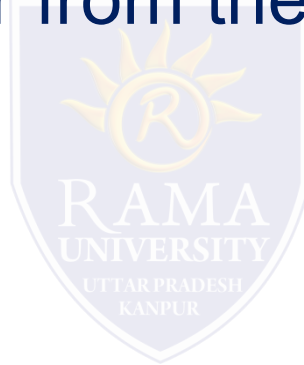




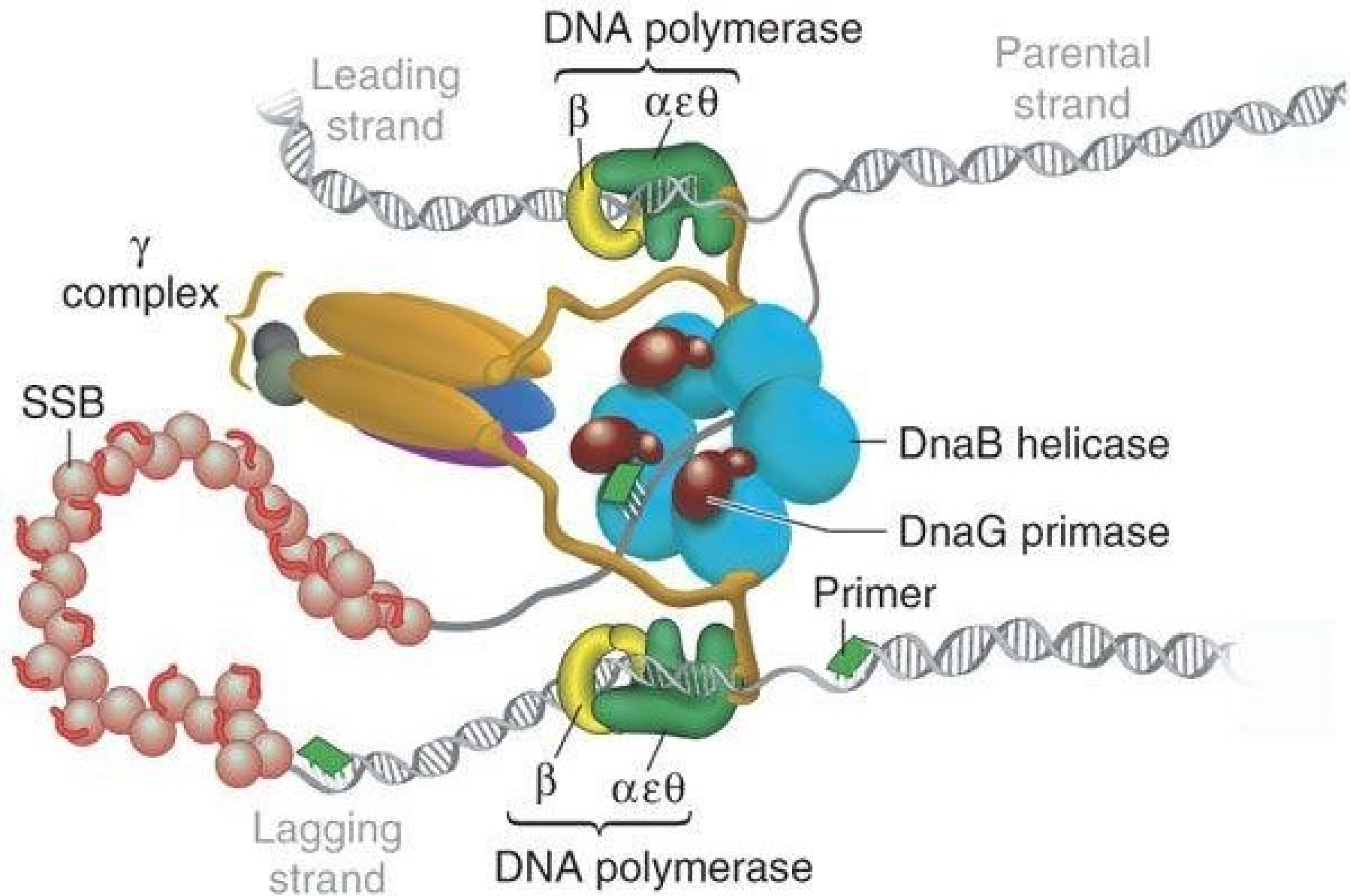
FACULTY OF ENGINEERING & TECHNOLOGY  
DEPARTMENT OF BIOTECHNOLOGY

## DNA Polymerase



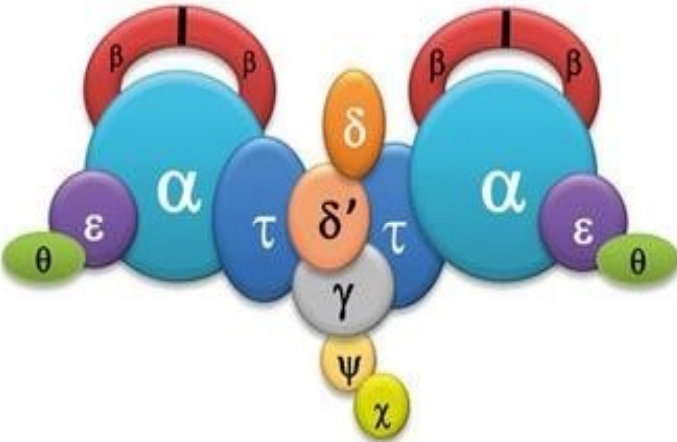


- ❖ DNA –dependent DNA polymerase catalyze DNA synthesis on DNA template during replication, following DNA damage ,recombination, after removal of the primer from the lagging strand.



## DNA Polymerase in *E. Coli*.





	Pol I	Pol II	Pol III	Pol IV	Pol V
DNA polymerase family	A	B	C	Y	Y
Activity	5'-3' polymerase 3'-5' exonuclease 5'-3' exonuclease	5'-3' polymerase 3'-5' exonuclease	5'-3' polymerase 3'-5' exonuclease	5'-3' polymerase	5'-3' polymerase
					
Number of molecules/cell					
- SOS	400	50 - 75	10 - 20	150 - 250	< 15
+ SOS	400	350 - 1000	10 - 20	1200 - 2500	200
Biological functions in the cell	DNA replication, Okazaki fragment maturation, DNA repair	DNA replication (backup DNA polymerase), DNA repair, TLS	DNA replication DNA repair	TLS	TLS

# E Coli Polymerases

**Comparison of DNA polymerases of E. coli**

	<b>Pol I</b>	<b>Pol II</b>	<b>Pol III</b>
<b>Gene</b>	polA	polB	polC, dnaE, dnaN, dnaQ etc
<b>Structure</b>	Polypeptide	Polypeptide	Multimeric complex
<b>Polymerization rate</b>	16-20	40	250-1000
<b>Processivity</b>	3-200	1500	>500000
<b>5'→3' polymerase</b>	Yes	Yes	Yes
<b>3'→5' exonuclease</b>	Yes	Yes	Yes
<b>5'→3' exonuclease</b>	Yes	No	No

## DNA POLYMERASE III

