



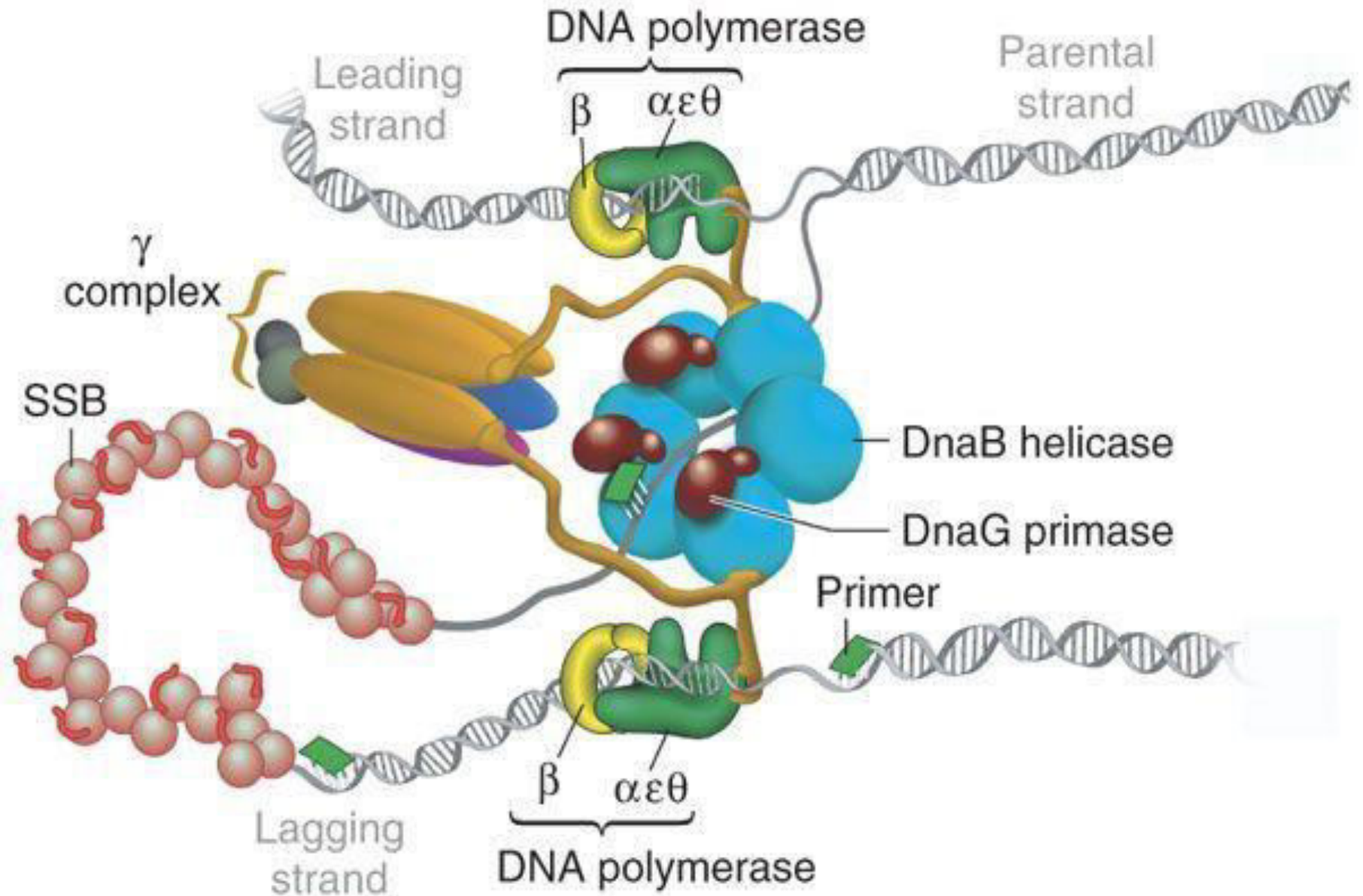
FACULTY OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY



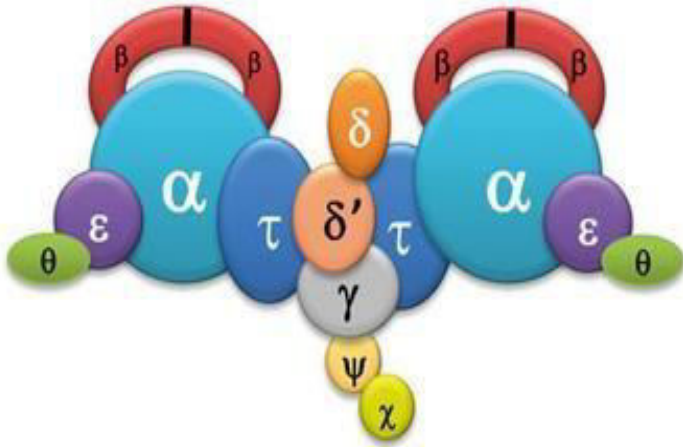


DNA Polymerase

- ❖ 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

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

DNA POLYMERASE III

