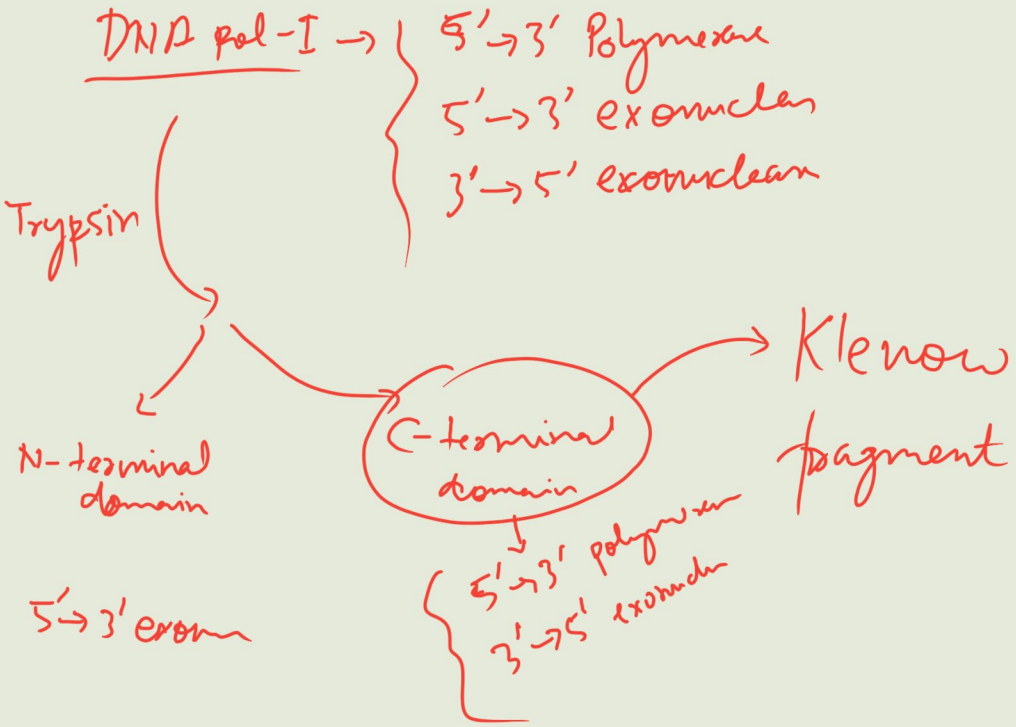
DNA polymerase



	DNA pol - I	DNA Pol II	DNA pol - III
3' → 5' exonuclear activity	✓	✓	✓
5' → 3' exonuclear activity	✓	X	X
5' → 3' Polymerase activity	✓	✓	✓
Polymerization rate	lowest rate (20nt/sec)	Modest (40nt/s)	highest (1000nt/s)
Processivity →	20 nt	1500 nt	50,000 nt
Function →	Primer removal DNA repair, Gap filling	DNA Repair	Main replicating enzyme

Mechanism of DNA polymerase

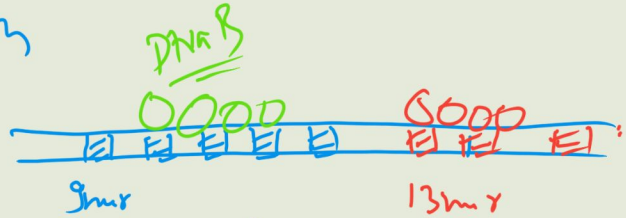
→ Template

→ Primer (3'OH free)

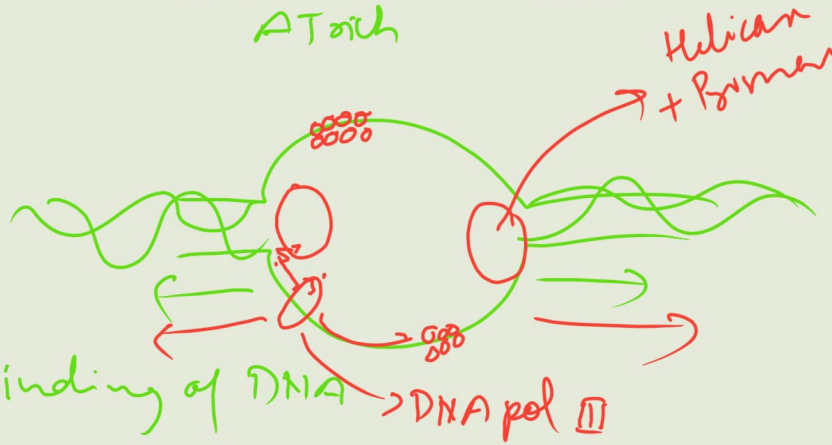
→ dNTPs (dATP, dCTP, dGTP, dTTP)

→ Mg^{2+} (divalent cation)

DNA Replication



* OriC (Origin of Replication)
  - → 9mer → 5 times
  - 13mer



Primosome

DnaA → OriC

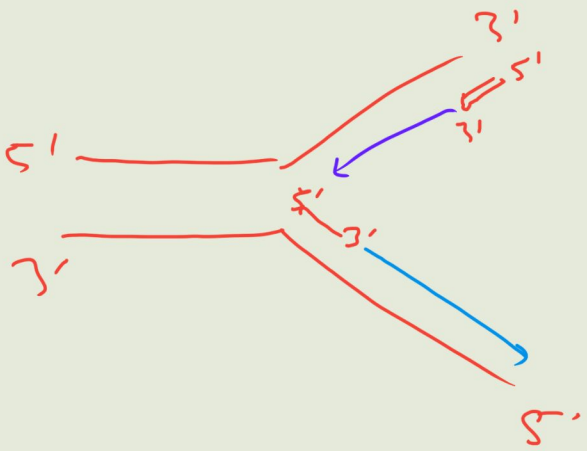
DnaB → Helicase → unwinding of DNA → DNA pol III

*

Topoisomerase → Nick in DNA and remove supercoiling

Primase → synthesize RNA primer

SSB → Single strand DNA binding protein


3'
5'
3'
5'
5'
3'
3'
5'