

<u>E. coli proteins</u>	<u>Eukaryotic proteins</u>	<u>Function</u>
Dna A	(Origin Recognizing) ORC protein complex	Recognizes origin of Replication
Dna B (Helicase)	MCM (Mini Chromosome maintenance)	Unwinding of DNA
Dna G (Primer)	Primase	Primer synthesis
SSB	RPA	ss DNA binding.
γ -complex (clamp loader)	RFC (Replication factor C)	Clamp loader
β -clamp (sliding clamp)	PCNA (Proliferating cell nuclear antigen) ↳ lagging	Sliding clamp.
DNA pol - III	Pol δ/ϵ ↳ leading strand	main replicating enzymes.

Eukaryotic DNA Polymerase

1) DNA pol α - $5' \rightarrow 3'$ DNA dependent DNA polymerase
 $5' \rightarrow 3'$ DNA dependent RNA polymerase

Synthesize RNA primer to ss DNA template
↳ iRNA (initiator RNA)
(8-12)

↳ 20-30 DNA

↳ iDNA

~~no $3' \rightarrow 5'$ exonuclease activity~~

∞ Main function is to start the DNA synthesis on both leading & lagging strand.

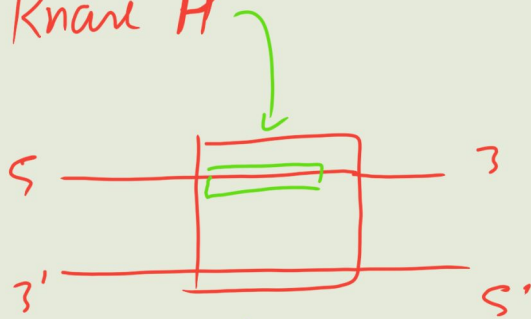
2) DNA pol β \rightarrow Base excision repair. \rightarrow $5' \rightarrow 3'$ polymerase.

3) DNA pol γ \rightarrow mitochondrial DNA replication,
 $5' \rightarrow 3'$ poly
 $3' \rightarrow 5'$ exonuclease

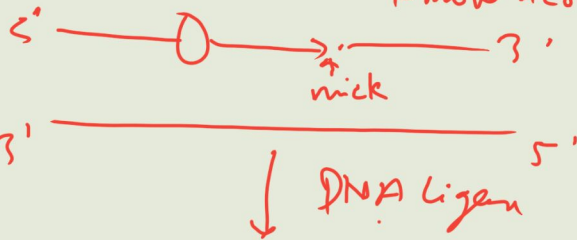
4) ^{replicating} Main DNA Polymerase \rightarrow $\delta \rightarrow$ lagging $5' \rightarrow 3'$ poly
 $\epsilon \rightarrow$ leading $3' \rightarrow 5'$ exonuclease.

Primer Removal (Eukaryotes)

1) RNase H

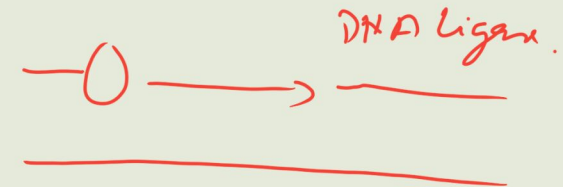
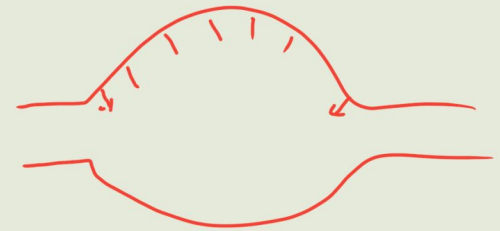


DNA Pol δ ↓ FEN1 (endonuclease)
Remove terminal RNA.



2) FLAP model

↓
Fen1 endonuclease



Fidelity

- 1) Accurate selection of nucleotide $\rightarrow 10^5 - 10^6$ nt
- 2) Proofreading \rightarrow 3' \rightarrow 5' exon \rightarrow 100 times $\rightarrow 10^7 - 10^8$
- 3) Post replicative mis match Repair \rightarrow 100 times $\rightarrow 10^9$