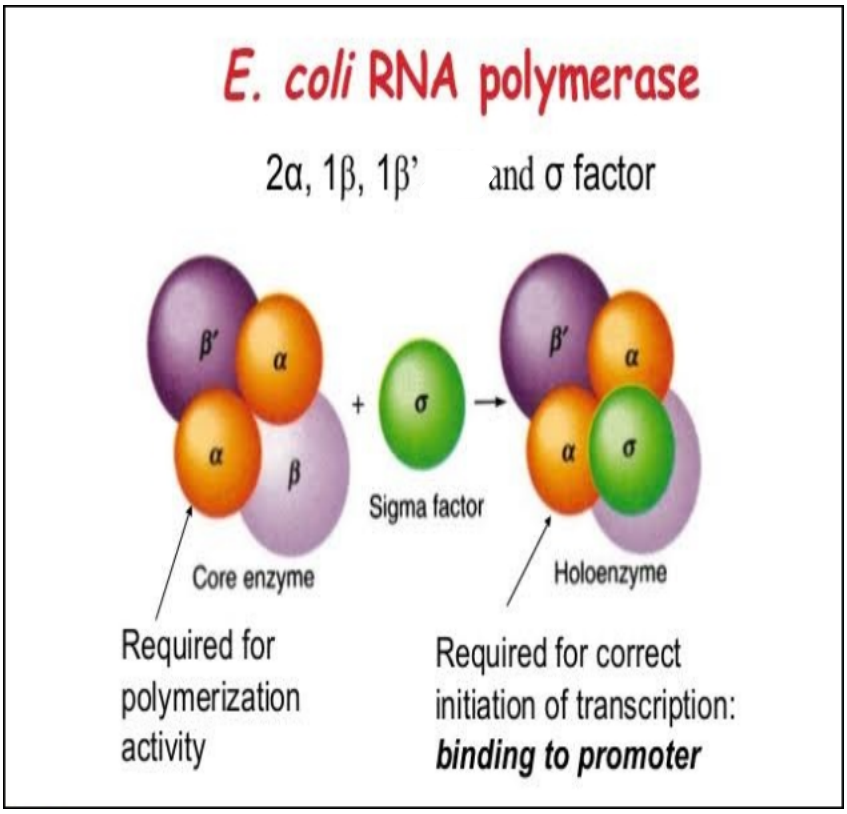
Core Course – VIII , Practical
5. Study of structures of prokaryotic RNA polymerase and eukaryotic RNA polymerase II through photograph

RNA polymerase in simple word means an enzymes that produce RNA in the cell these polymerase enzymes is very essential for existence of and moreover found in all organism ranging from bacteria to viruses and in eukaryotic organism too.

- It was discovered by Samuel B Weiss & Jerard Hurwitz in 1960.
- In prokaryotes , single single type of RNA polymerase synthesis all different type of RNA such as mRNA , tRNA & rRNA.
- Eukaryotic RNA is multi subunit enzyme.
- It has molecular mass similar to 465kDa

RNA polymerase in prokaryotes :

RNA is synthesized by a single RNA polymers enzymes which contains multiple polypeptide subunits . In *E.coli ,* the RNA polymerase has five five subunits : two α , one β , one β′ and one σ subunit . This form is called the holoenzyme . The σ subunit may dissociate from the other subunits to leave a form known as the core enzyme.These two forms of RNA polymerase have different role in transcription.



RNA polymerase II in eukaryotes :

RNA polymerase II is a multi protein complex that transcribe DNA into precursors of messenger RNA (mRNA) and most small nuclear RNA and micro RNA. It is one of the three RNAP enzymes found in the nucleus of eukaryotic cells. A 550kDa complex of 12 subunits RNAP II is the most studied type of RNA polymerase. The eukaryotic core RNA polymerase II was first purified using transcription assays. The purified enzyme has typically 10-12 subunits (12 in human and yeast). Subunits are ,

1) RPB1
2) RPB2
3) RPB3
4) RPB4
5) RPB5
6) RPB6
7) RPB7
8) RPB8
9) RPB9
10) RPB10
11) RPB11
12) RPB12