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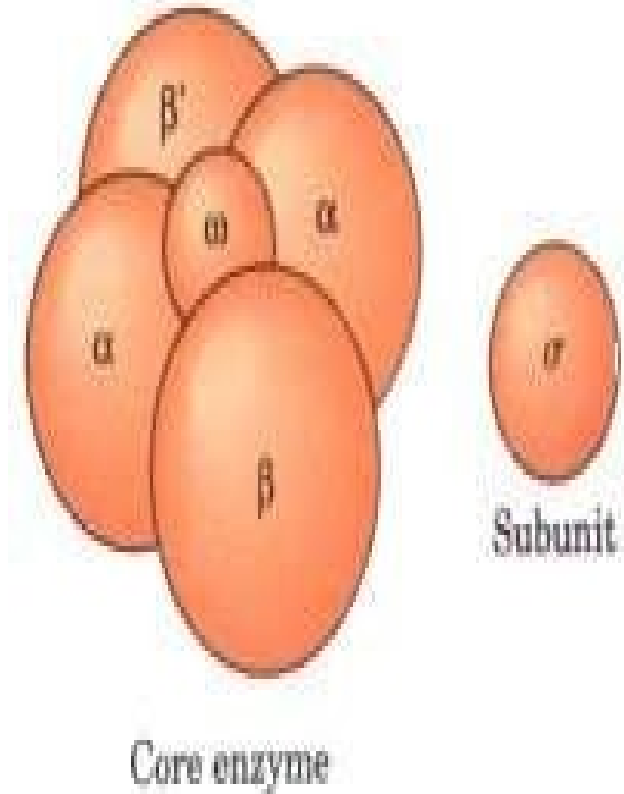
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FACULTY OF ENGINEERING & TECHNOLOGY
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Bacterial DNA-Dependent RNA Polymerase

The DNA-dependent RNA polymerase (RNAP) of the bacterium *Escherichia coli* exists as an approximately 400 kDa core complex consisting of-

- two identical α subunits,
- similar but not identical β and β' subunits, and
- an ω subunit and a sigma subunit (σ)
- Beta is thought to be the catalytic subunit.



Bacterial DNA-Dependent RNA Polymerase

- RNAP, a metalloenzyme, also contains two zinc molecules.
- The core RNA polymerase associates with a specific protein factor (the sigma σ factor) that helps the core enzyme recognize and bind to the specific deoxynucleotide sequence of the promoter region to form the preinitiation complex (PIC)
- Bacteria contain multiple factors, each of which acts as a regulatory protein.



Mammalian DNA-Dependent RNA Polymerases

Mammalian cells possess three distinct nuclear DNA-Dependent RNA Polymerases

- RNA polymerase I is for the synthesis of r RNA
- RNA polymerase II is for the synthesis of m RNA and miRNA
- RNA polymerase III is for the synthesis of tRNA/5S rRNA, snRNA

