

* Transcription Cycle :-

RNA polymerase bind to DNA & locate promoter (P) DNA sequence element



once bound to promoter, RNA polymerase melts two DNA strands & form open promoter complex (pre initiation complex [PIC])



Strand separation allows polymerase to access coding information in template strand of DNA



Using coding information of template, RNAP catalyzes coupling of 1st base to 2nd template directed ribonucleoside triphosphate to form dinucleotide



After RNA chain length reaches ~10 to 20 nts polymerase undergoes conformational change & able to move away from promoter & transcribing down the transcription unit



At this phase of transcription cycle, σ factor is released from RNAP



Successive residues are added to 3'-OH terminus of nascent RNA molecule until transcription termination site (RNAP undergo DNA sequence element (T) is encountered



upon encountering transcription termination site
RNAP undergoes additional conformational
change that leads to release of completed
RNA chain, the DNA template & RNAP

↓
RNAP can rebind to DNA beginning the
promoter search process & cycle is repeated

↓
RNAP separates from DNA template
to allow transcription to proceed

↓
RNAP continues to synthesize RNA
using coding information of template
to form complementary

↓
After RNA chain length reaches 50 to 100
nucleotides, polymerase undergoes conformational change
capable to move away from promoter

↓
At this phase of transcription cycle, an
RNA gene product is released from RNAP