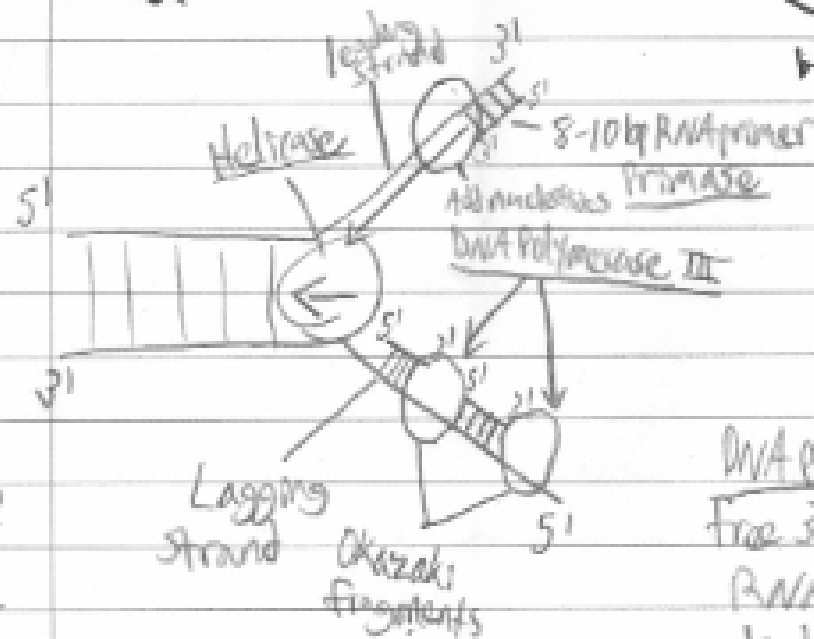
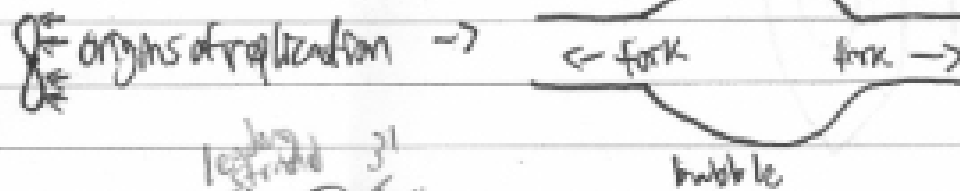


# Molecular Genetics

10/22/12

## DNA Replication



leading strand = continuous  
lagging strand = discontinuous

DNA polymerase I - adds nucleotides to free 3' end that is adjacent to 5' end of RNA primer when RNA primer begins to be removed.

DNA ligase - seals the sugar-phosphate backbone at the "nick" between fragments.



nick = break in sugar-phosphate backbone

topoisomerase - relieves over winding of DNA coil caused by helicase opening the double strand, creating a nick in one strand

SSBPs - single-stranded DNA binding proteins - keep separated strands from reconnecting before replication can occur.

DNA poly III - consists of clamp, catalytic core,

## Transcription

DNA → RNA

10/24/12

## Features of RNA

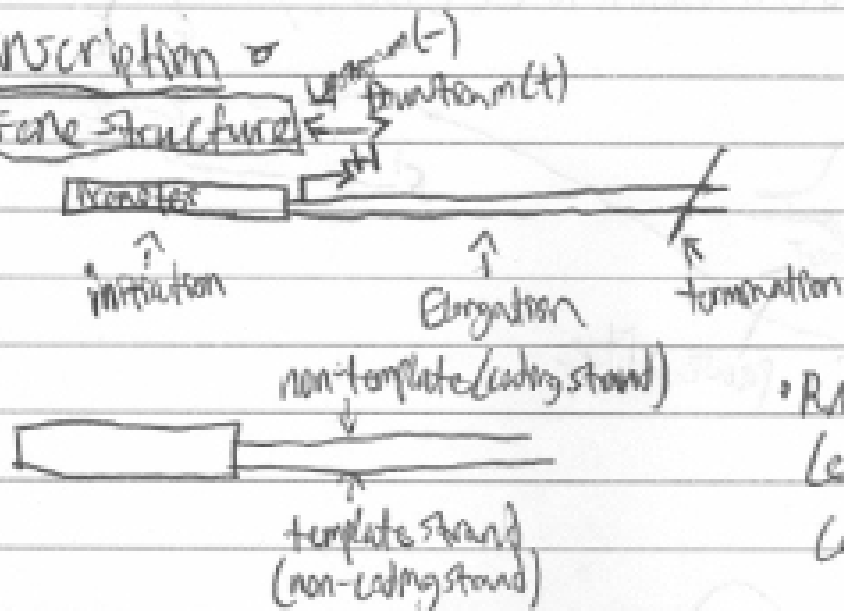
- ① single strand
- ② folding into secondary structures
- ③ has G, C, A, U (U=uracil)
- ④ ribose sugar comprises sugar phosphate backbone

## Types of RNA

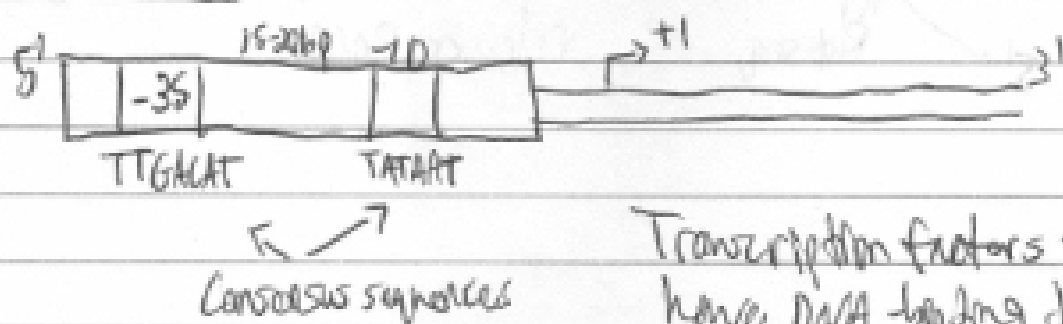
- mRNA - messenger - is deciphered into a protein (amino acid seq.)
- tRNA - transfer - functional RNA mol. - reads codon and matches appropriate amino acid to be added.
- rRNA - ribosomal - functional - part of ribosome.
  - created in nucleolus

## Transcription

\* Gene structure



## Initiation: Prokaryotes



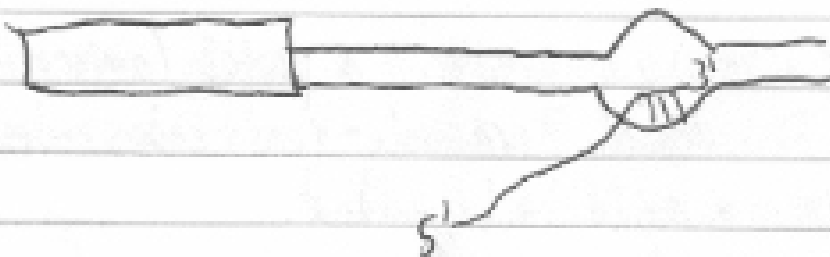
Transcription factors - proteins that typically have DNA binding domains that help initiate transcription

# prokaryotes

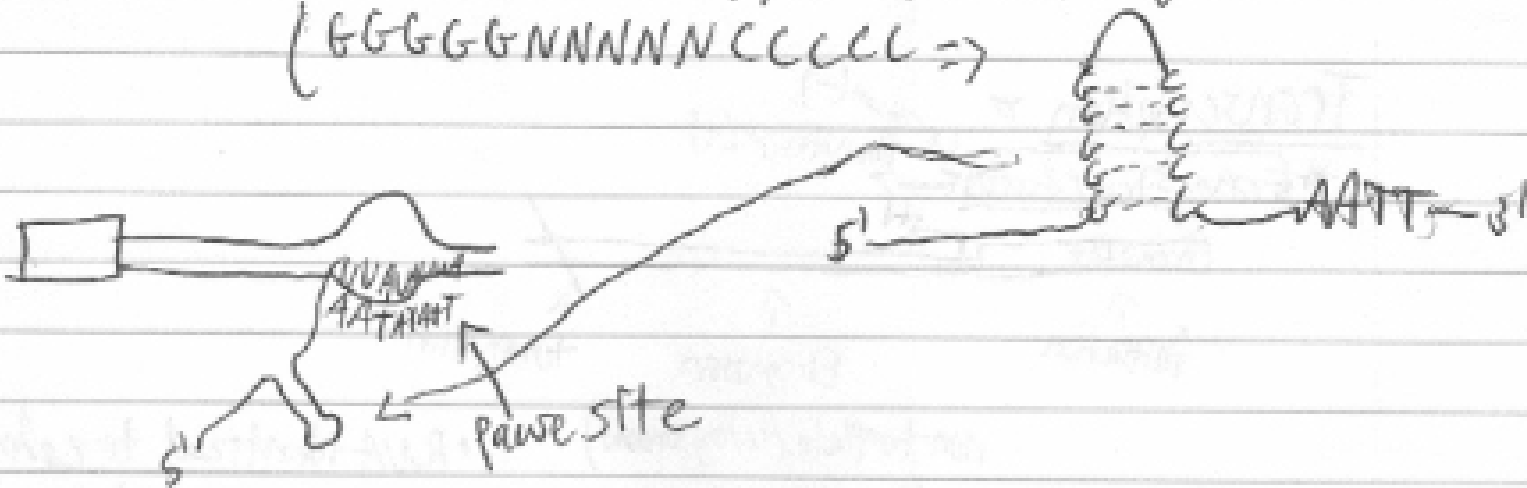
RNA polymerase  
2  $\alpha$  subunits  
B subunit  
B' subunit  
 $\sigma$  (sigma) factor



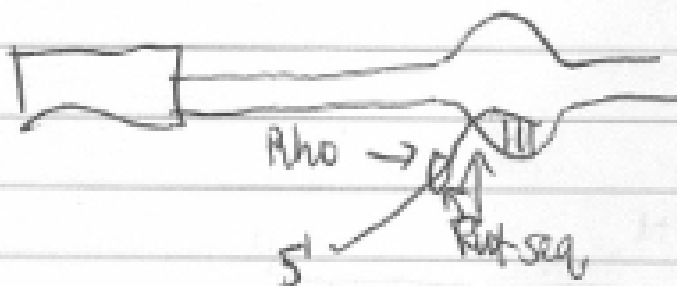
## Termination -



① Intrinsic - G-C run followed by an A-T rich seq.  
(GGGGNNNNCCCC  $\Rightarrow$ )



## Rho mediated



Rho protein binds at Rho seq. and travels to RNA pol. to release it and release RNA.