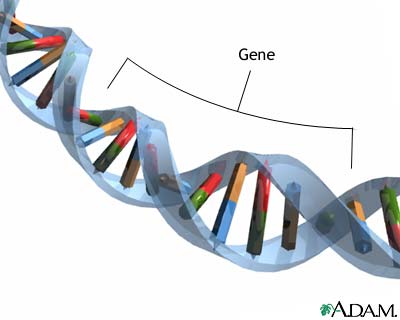
Name: \_\_\_\_\_\_\_\_\_\_\_

**Main Ideas Title: Transcription** Period: \_\_\_ Seat:\_\_

Genes: Your Most of our DNA is “junk” DNA= no instructions

Special Instructions \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Genes vary in length.

Some contain hundreds of base pairs

Some contain thousands of base pairs

19,000 human genes have been identified

The instructions in your genes are directions for synthesizing (making) specific polypeptides.

Gene Expression Gene Expression and protein synthesis are the processes of re-

& Protein writing the DNA instruction and then reading the instructions in DNA to make a Synthesis protein

To read the instructions:

-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Transcription)

-2nd read every 3 bases in the RNA (Translation)

The flow of instructions (central dogma) is symbolized as

\_\_\_\_\_ 🡪 \_\_\_\_\_ 🡪 \_\_\_\_\_

Transcription on Transcribe each of these 2 sequence of DNA into mRNA (Remember A-U, T-A, G=C)

Paper Sequence 1 – Human Insulin gene sequence

DNA: T A C G T A C A C G T T A C A A C G T G A A G G T A A

mRNA:

Sequence 2 – Cow Insulin gene sequence

DNA: T A C G T A C A T G T T A C A A C G C G A A G G C A C

mRNA:

In the cell This step takes place inside the nucleus

What happens? Basic of basics summary…

-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

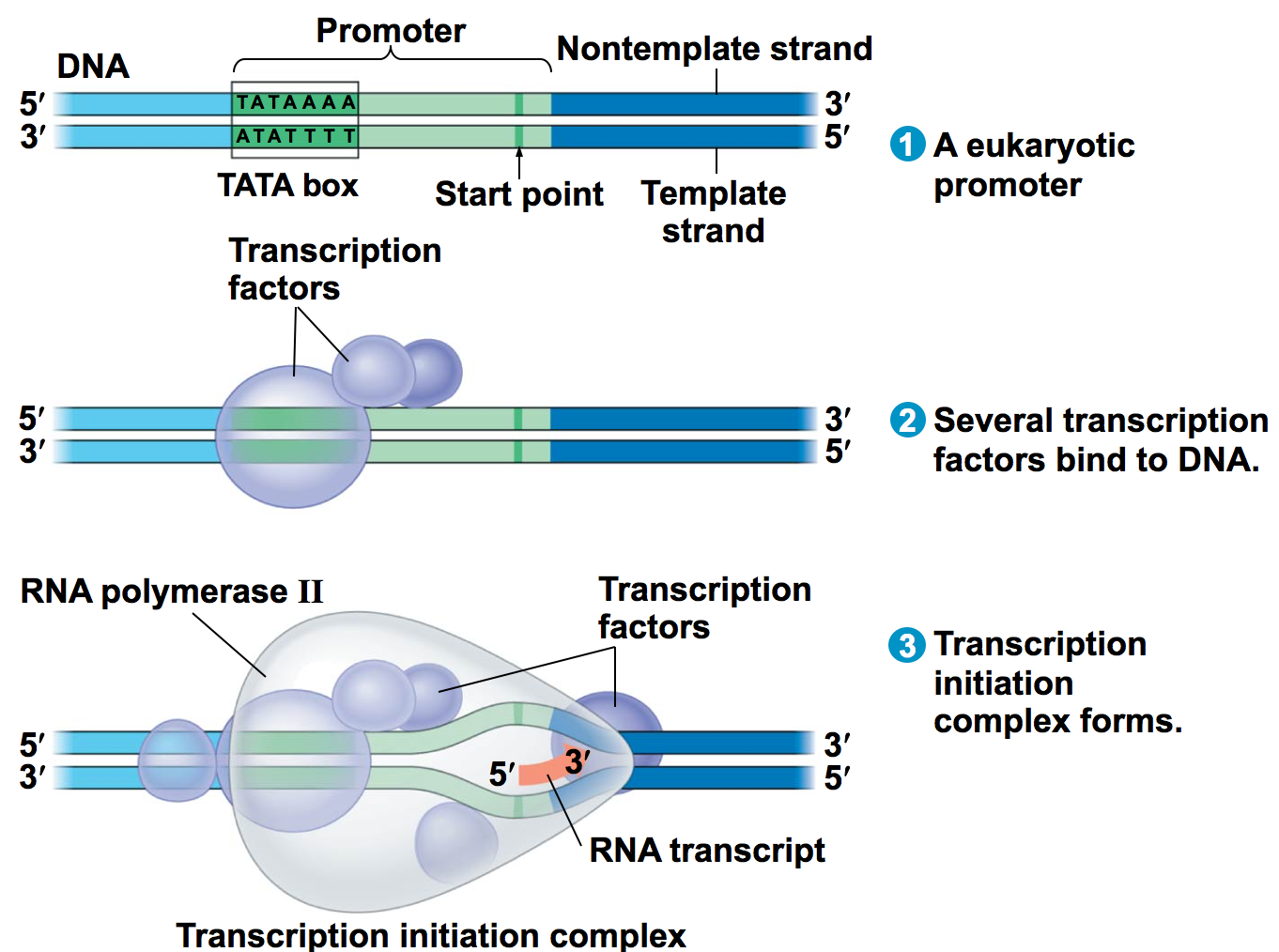
-mRNA leaves the nucleus to find a ribosome

-The DNA zips back up and is unchanged

Initiation 1)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with additional transcription factors forming a transcription initiation complex

3) RNA Polymerase begins to unwind the DNA

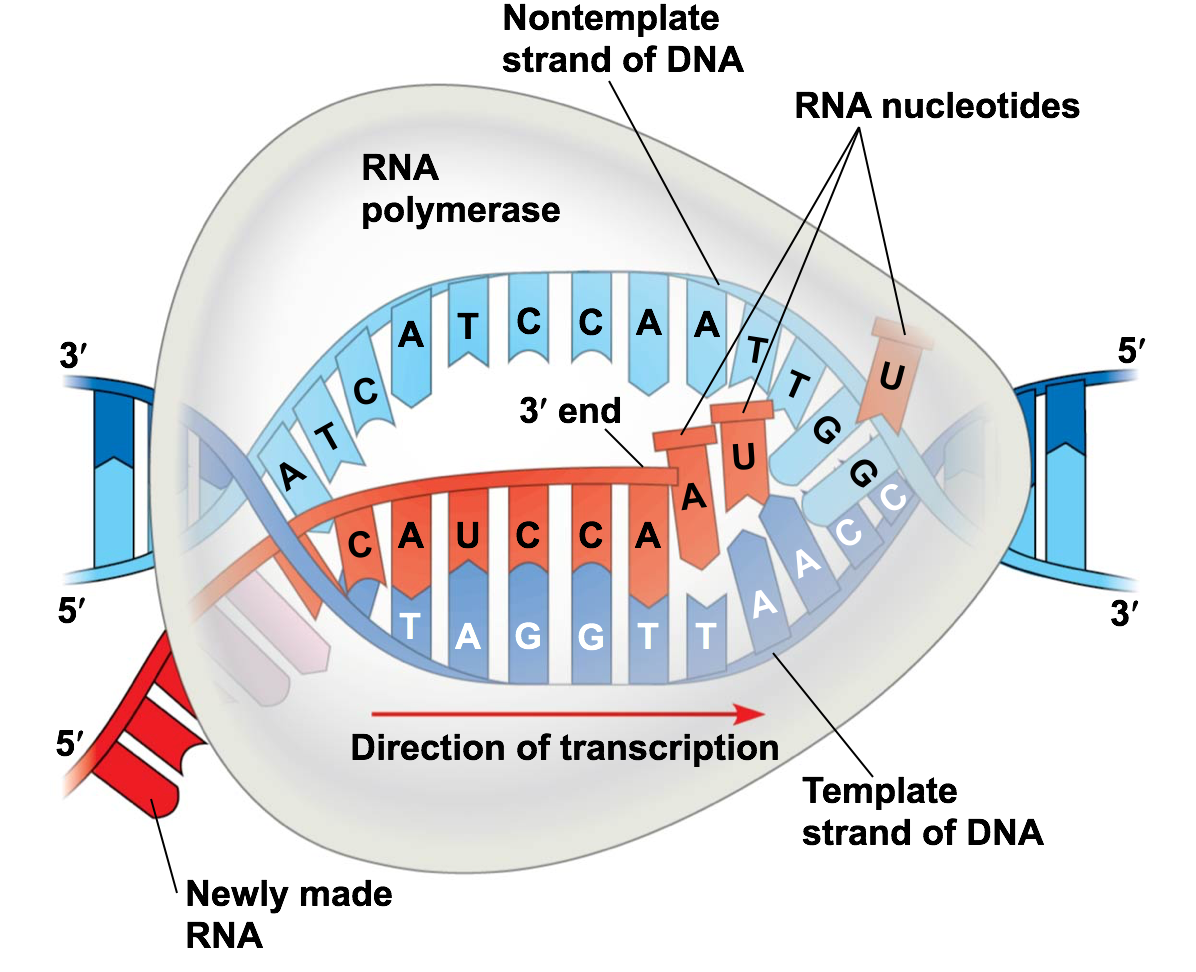


Elongation 1) RNA polymerase unwinds the DNA

2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

molecule in the 5’ 🡪 3’ direction

3) mRNA begins to peel away from the DNA and the DNA zips back up



Termination \*In prokaryotes it stops at a termination sequence

\*Eukaryotes:

1)RNA polymerase transcribes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (AAUAAA)

2) Proteins cut the pre-mRNA free

RNA Processing 5’ end gets a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(modified guanine nucleotide)

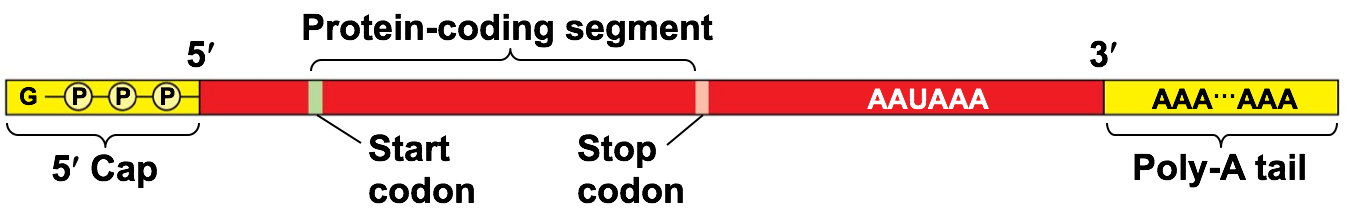
3’ end gets a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by adding 50-250 more adenines (A)

WHY???

\*Facilitates the export of mature mRNA

\*Helps protect the mRNA from degradation

\*Helps 5’ end attach to ribosome



RNA Splicing Not all parts of the pre-mRNA are needed to code for a polypeptide in eukaryotes

-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

-Exons are spliced together

\*Alternate RNA splicing – one gene can code for 2 or more polypeptides

Humans…19,000 genes…100,000 different proteins



Summary