Objective

Summarize the process of transcription.

How do we get from DNA to expression?

Traits, such as eye color, are determined by proteins that are built according to instructions coded in DNA

Proteins, however, are not built directly from DNA.Ribonucleic acid is also involved.

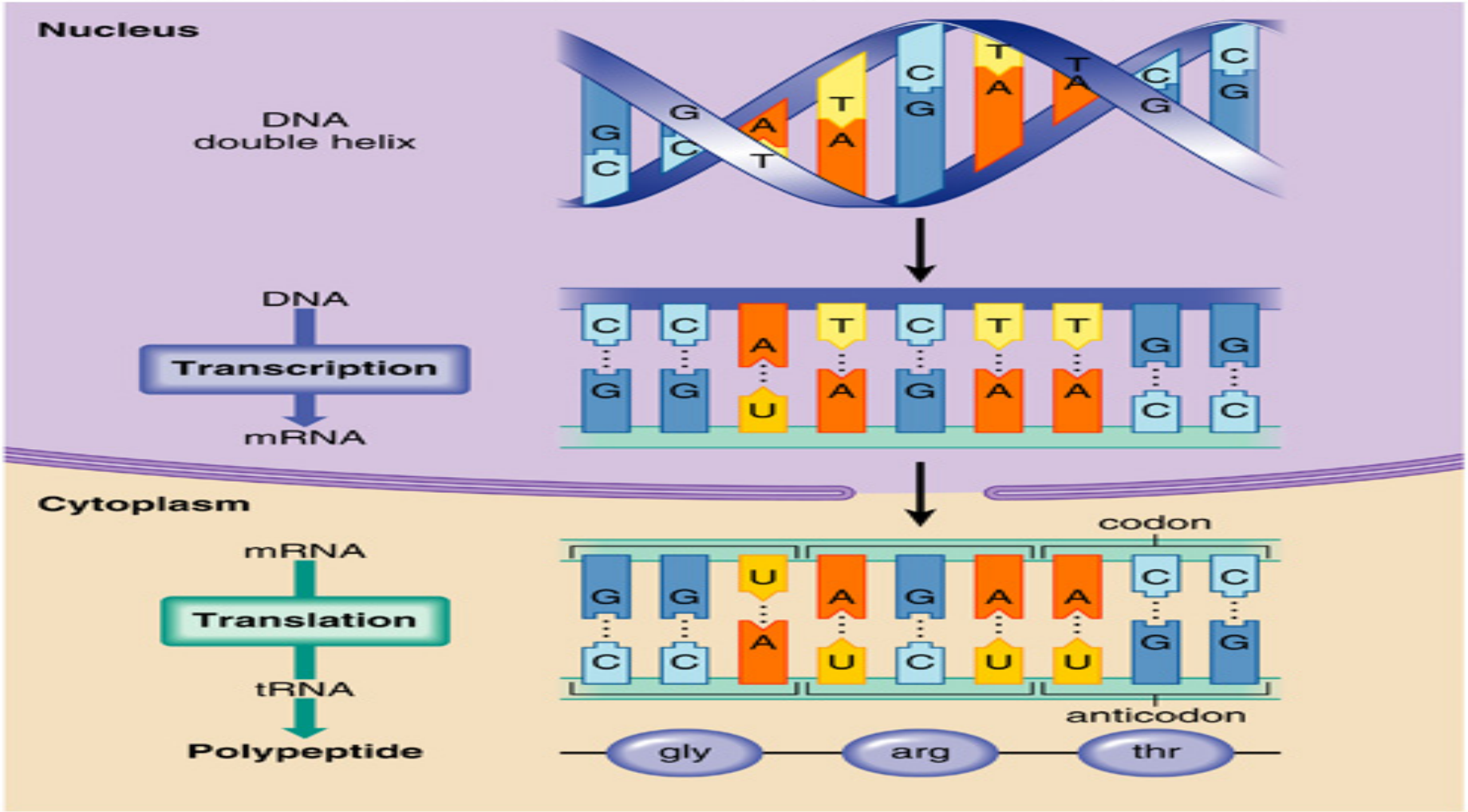
How is RNA different from DNA?

1. RNA consists of a single strand of nucleotides
2. RNA nucleotides contain the five-carbon sugar ribose
3. In addition to the A, G, and C nitrogen bases found in DNA, RNA nucleotides can have a nitrogen base called uracil (U).

Decoding information in DNA

The instructions for making a protein are transferred from a gene to an RNA molecule in a process called **transcription**.

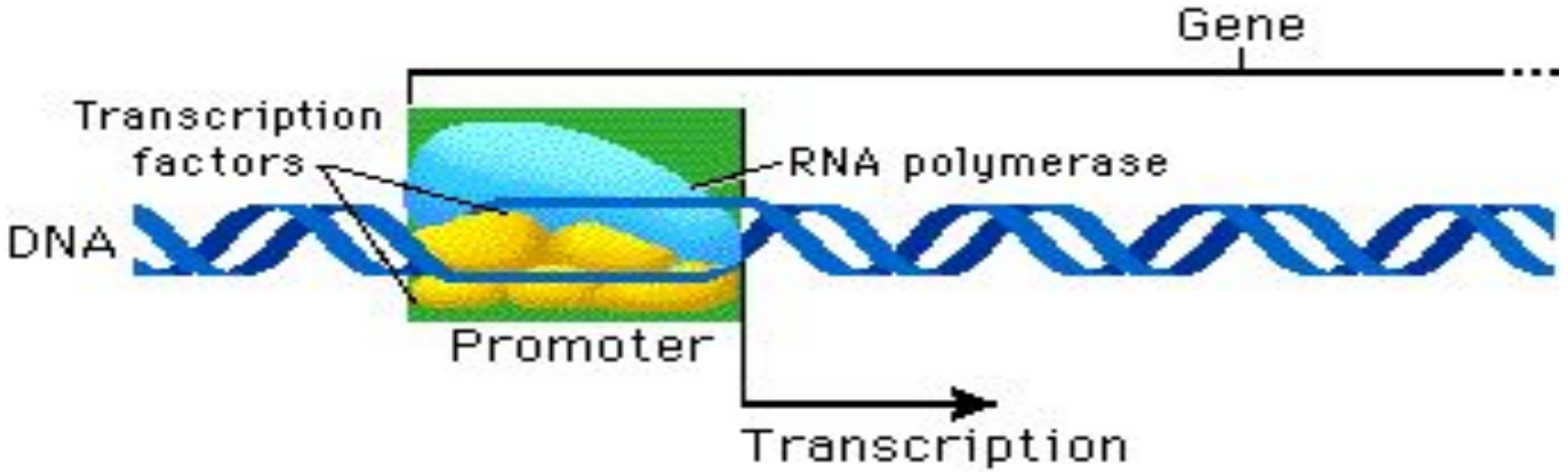
- Transcription takes the information found in a gene in the DNA and transfers it to a molecule of RNA.
- RNA polymerase, an enzyme that adds and links complementary RNA nucleotides during transcription, is required.



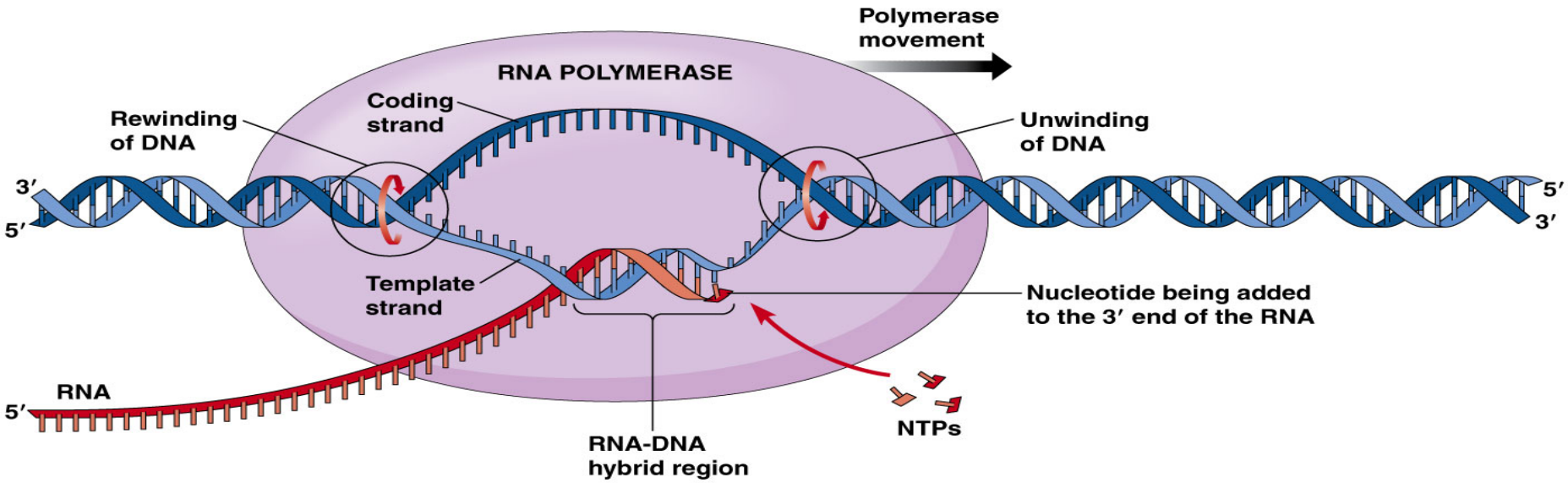
Steps of Transcription

Step 1: RNA polymerase binds to the gene's promoter using DNA as a template.

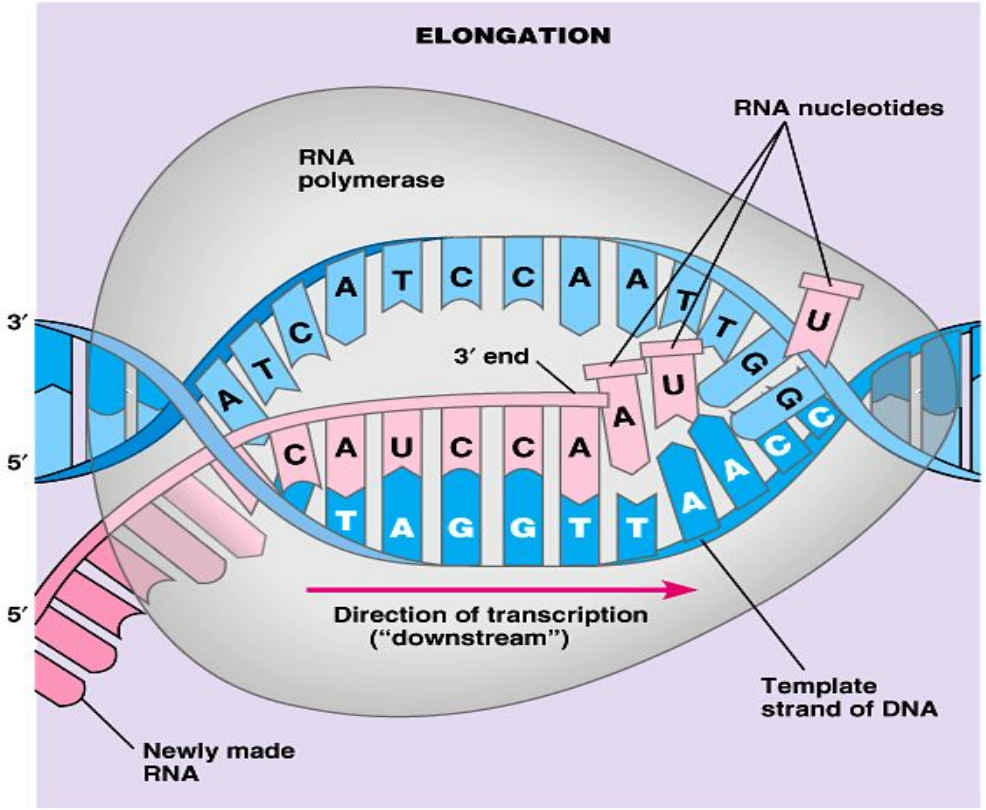
Promoter acts as a "start" signal for transcription



Step 2: The RNA polymerase unwinds and separates the two DNA strands of the double helix exposing the DNA nucleotides on each strand.



Step 3: Complementary RNA nucleotides are added.



Transcription continues until the polymerase reaches a “stop” signal in the DNA.

The “stop” signal is a sequence of bases that marks the end of each gene

Behind the polymerase the DNA closes up by forming the hydrogen bonds

Where does Transcription occur?

Eukaryotic cells- in the nucleus
Prokaryotic cells- in the cytoplasm