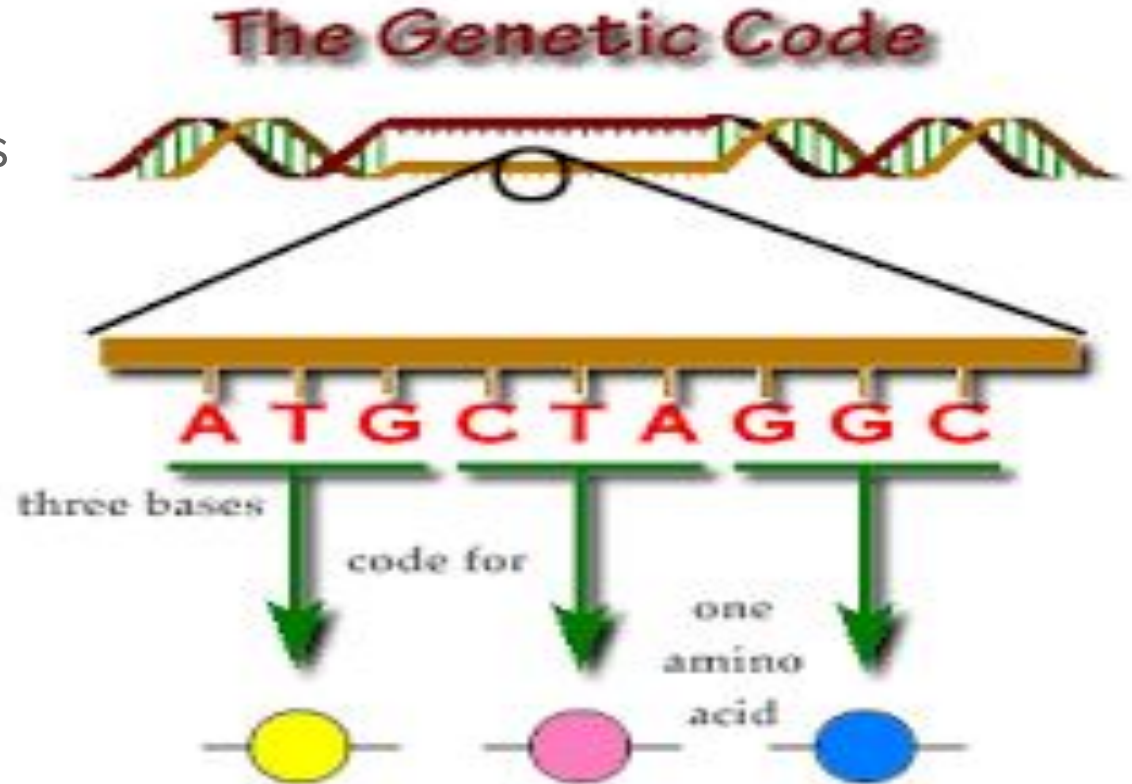


Chapter 12.3: RNA and Protein Synthesis

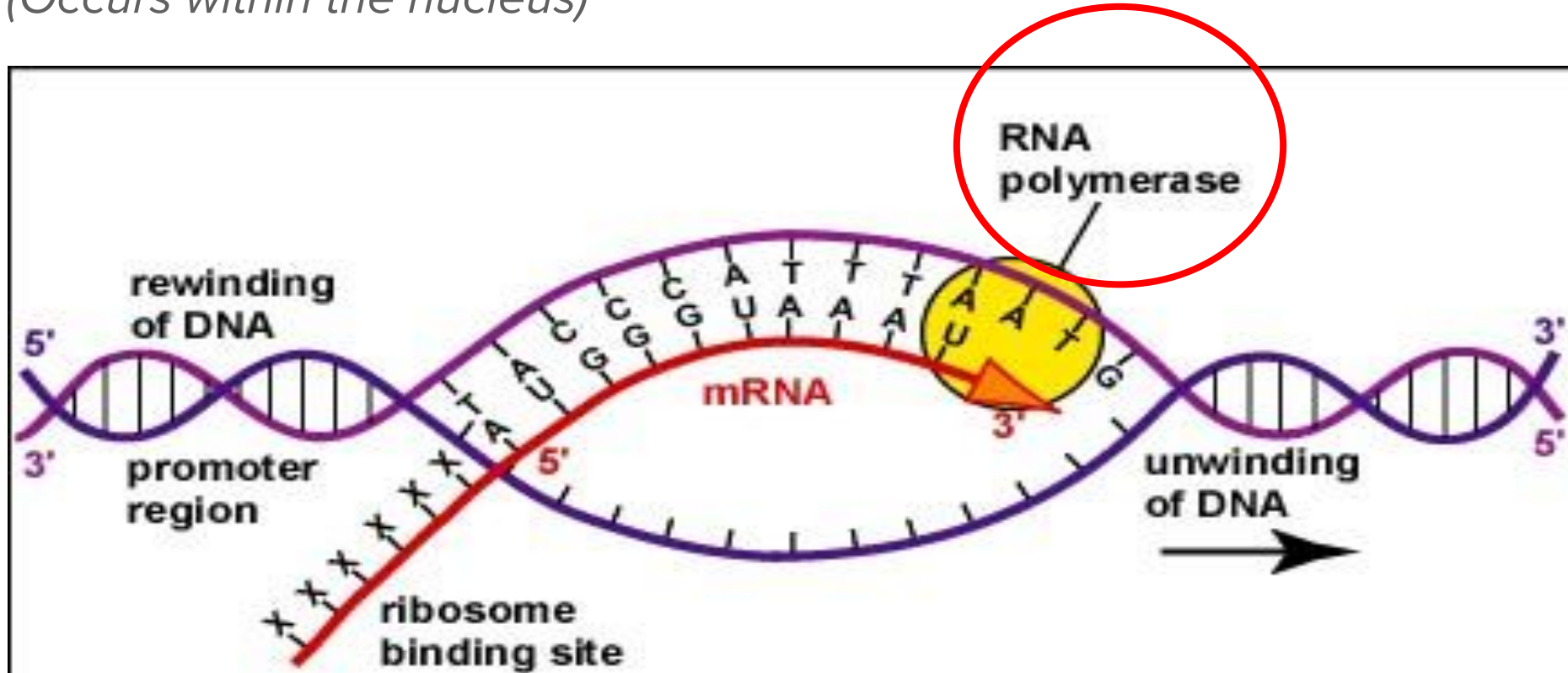
Genes: coded DNA instructions that control the production of proteins within the cell

To build proteins for cell function, messages have to be **transcribed** to an RNA molecule



Transcription: the process of copying part of the nucleotide sequence of DNA into a complementary RNA sequence.

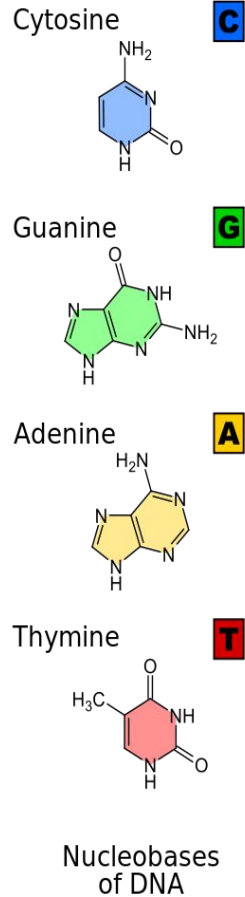
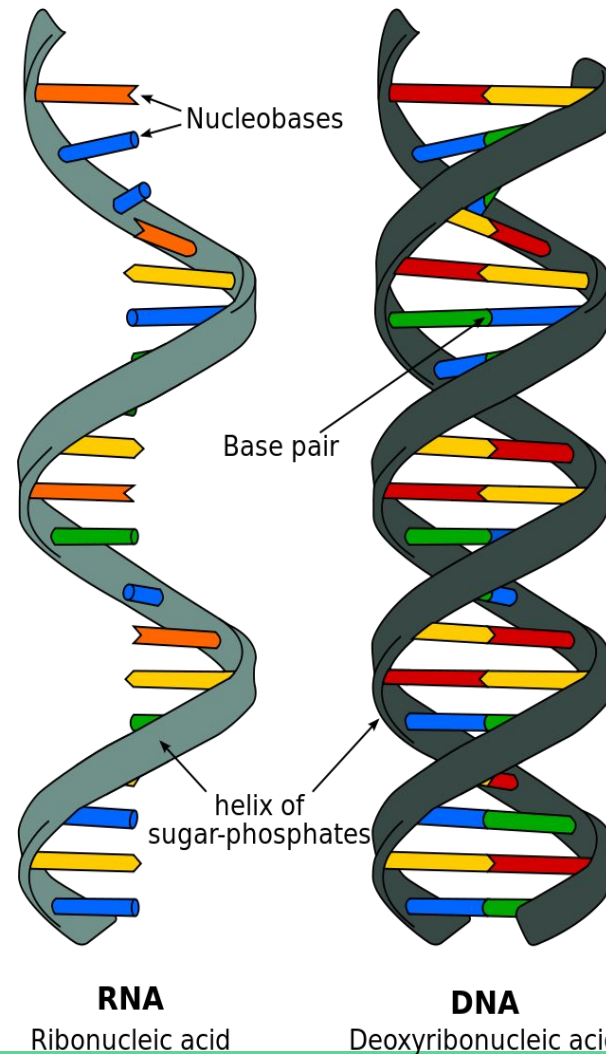
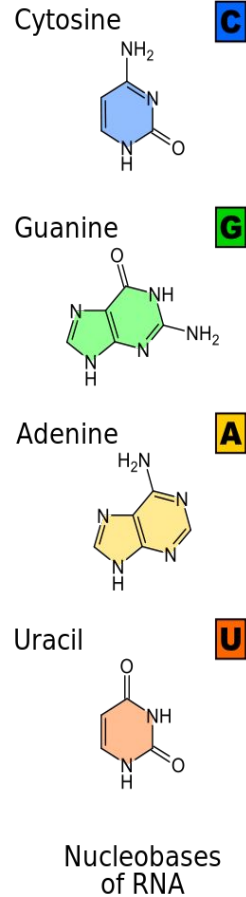
(Occurs within the nucleus)



RNA is similar to DNA

Three main differences:

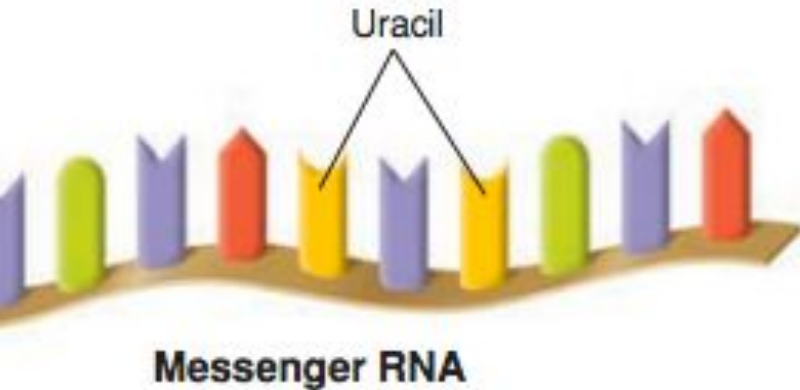
- Sugar is ribose
- Single stranded
- Contains **uracil (U)** rather than thymine



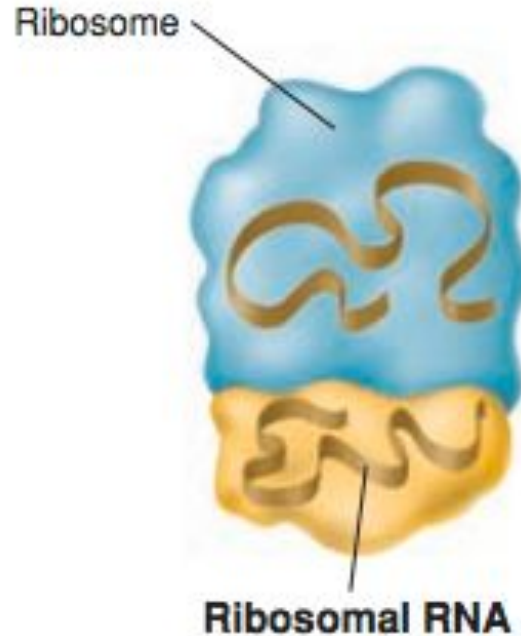
3 Types of RNA

- Messenger RNA (mRNA)

Serves as “messengers” from DNA to the cell.



- Ribosomal RNA (rRNA) proteins are assembled on ribosomes

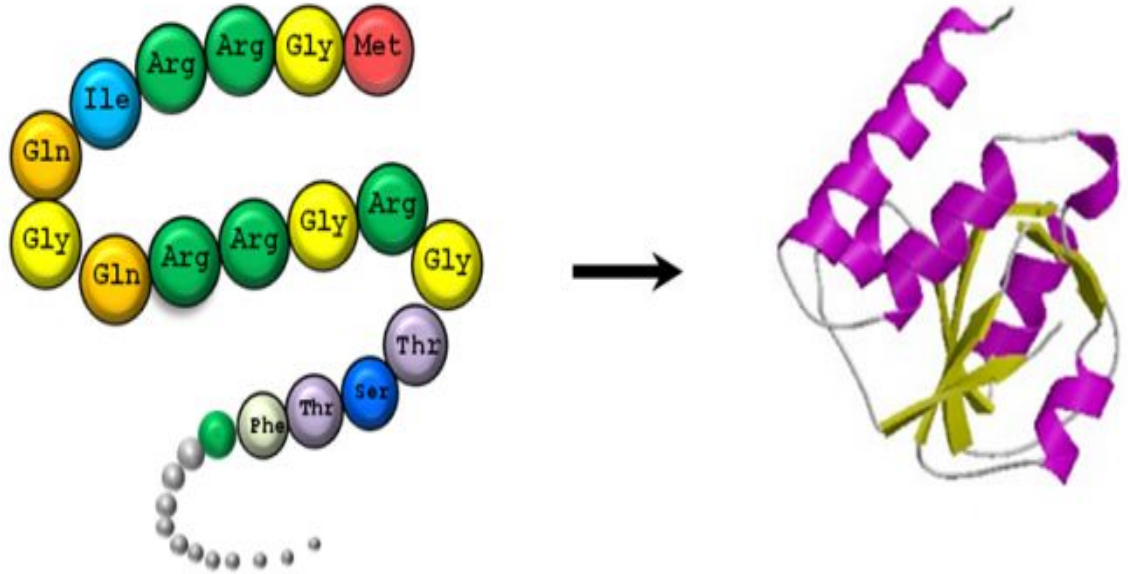


- Transfer RNA (tRNA) Transfers amino acids to the ribosome

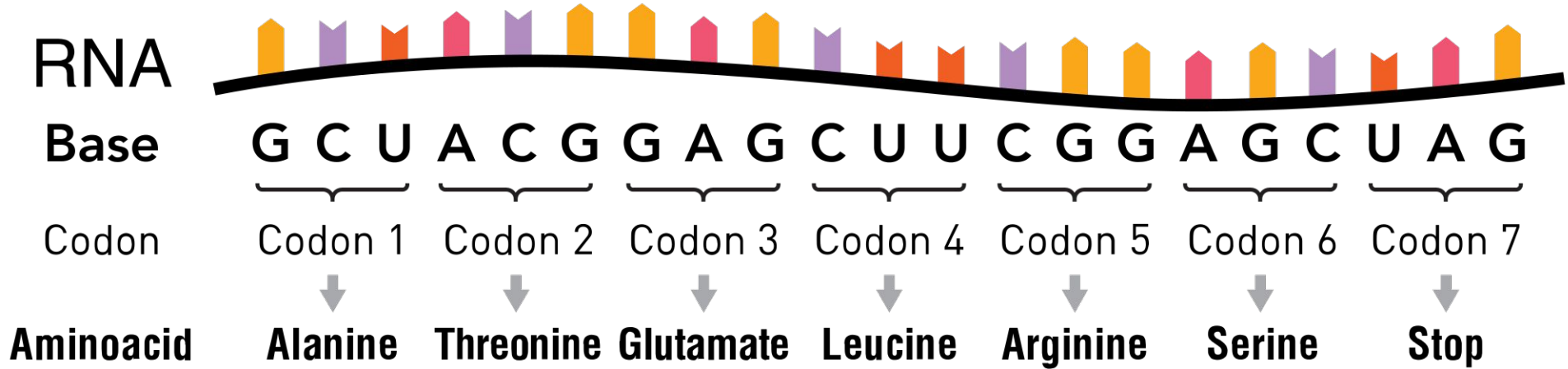


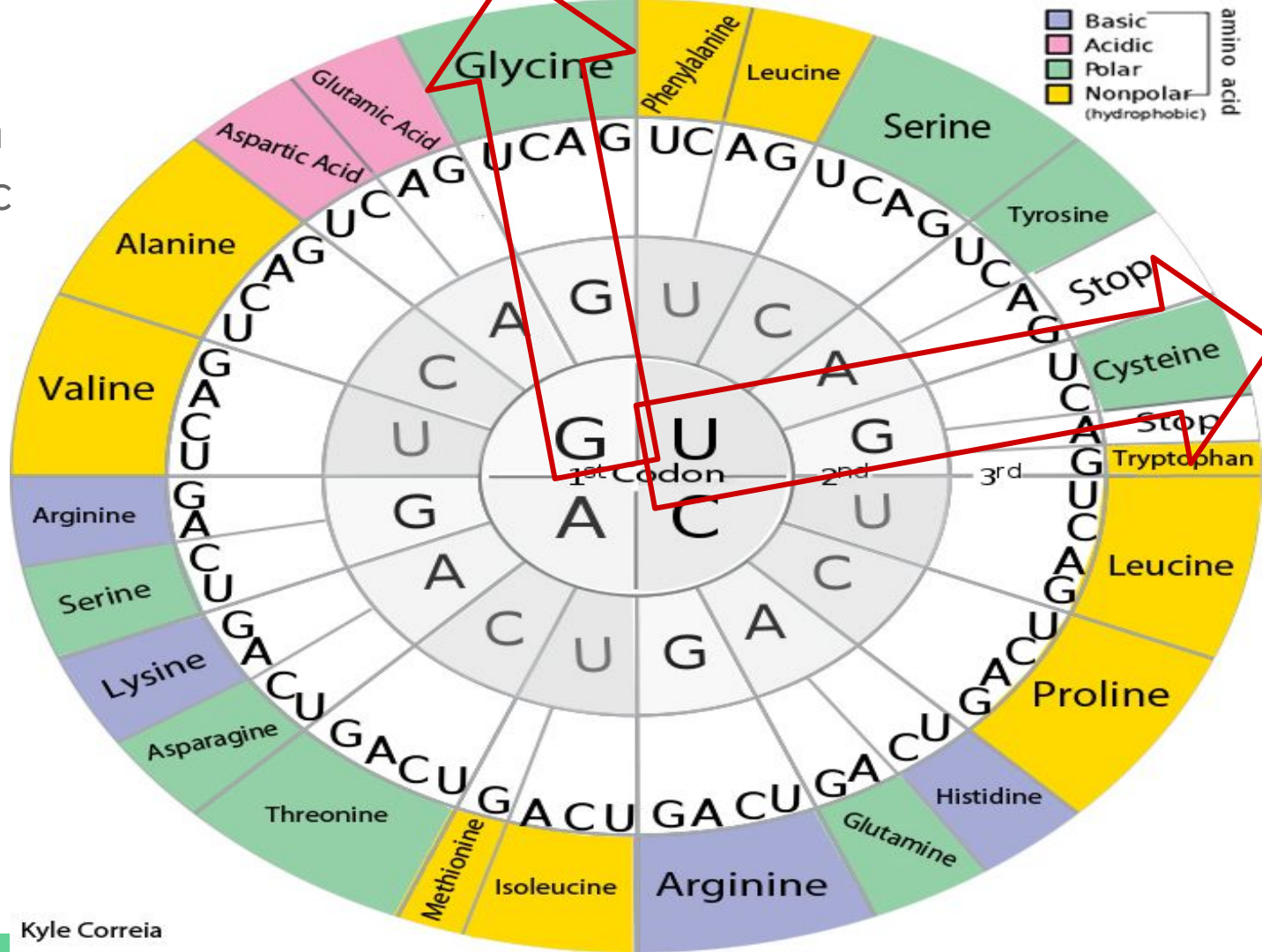
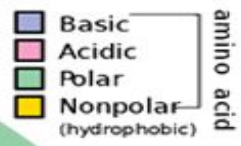
Translation: the process of synthesizing proteins from the RNA molecule with information from the DNA
(occurs in the cytoplasm)

Proteins are made by joining amino acids together into long chains called **polypeptides**.



Codon: a series of 3 nucleotide bases that code for a specific amino acid





A codon table is used to translate a codon to a specific amino acid

codon → UGC

Amino acid = Cysteine

Codon → GGC

Amino acid = Glycine

DNA strand
(template)



TRANSCRIPTION

First Step → (Inside the nucleus)
Transcription from a DNA
molecule

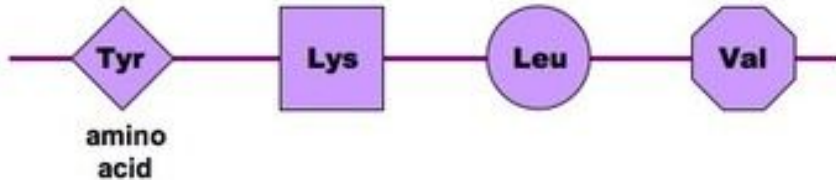
mRNA
transcript



Second step → (on ribosomes)
mRNA is translated to form a
polypeptide chain

TRANSLATION

Polypeptide



DNA to Proteins

