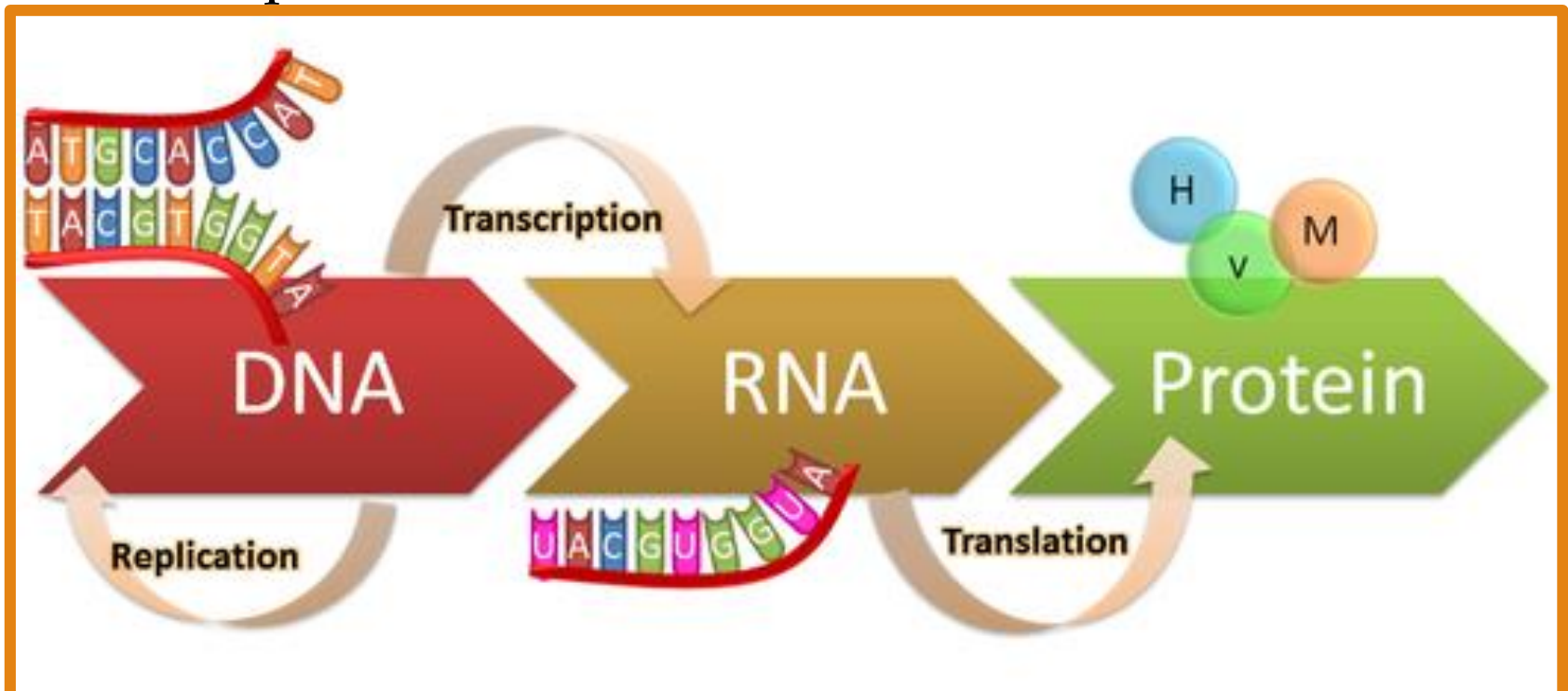


RNA and Protein Synthesis

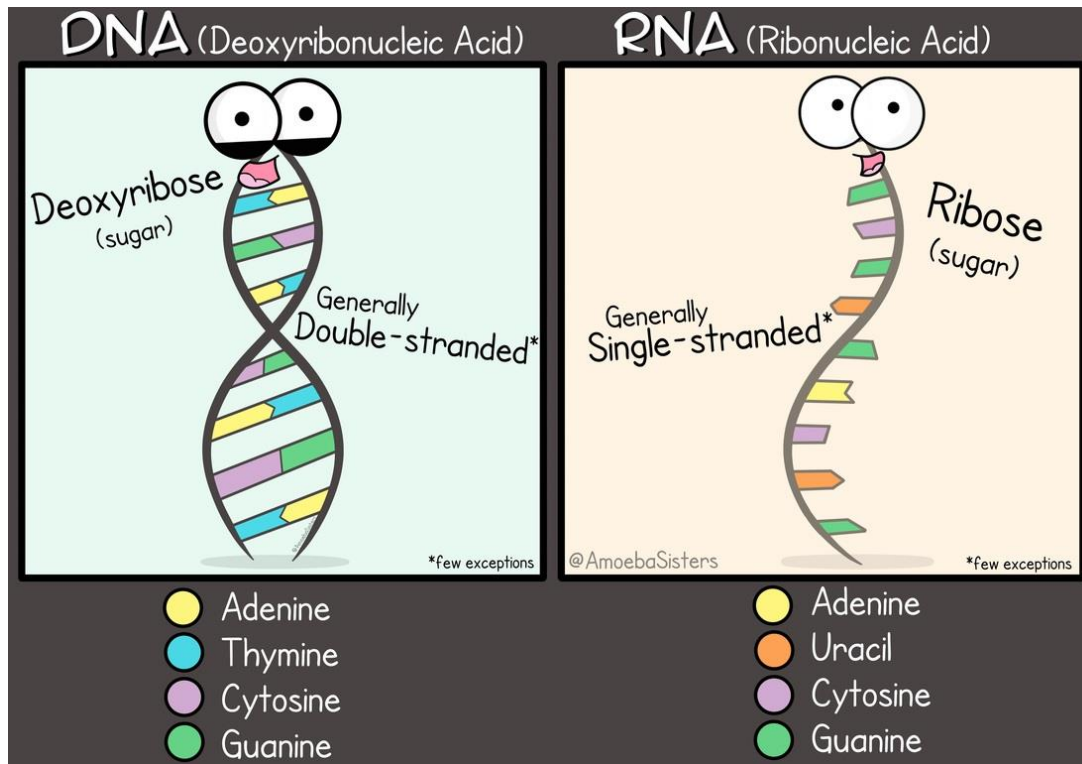
Central Dogma

The central dogma of molecular biology explains the flow of genetic information, from DNA to RNA, to make a functional product, a protein.



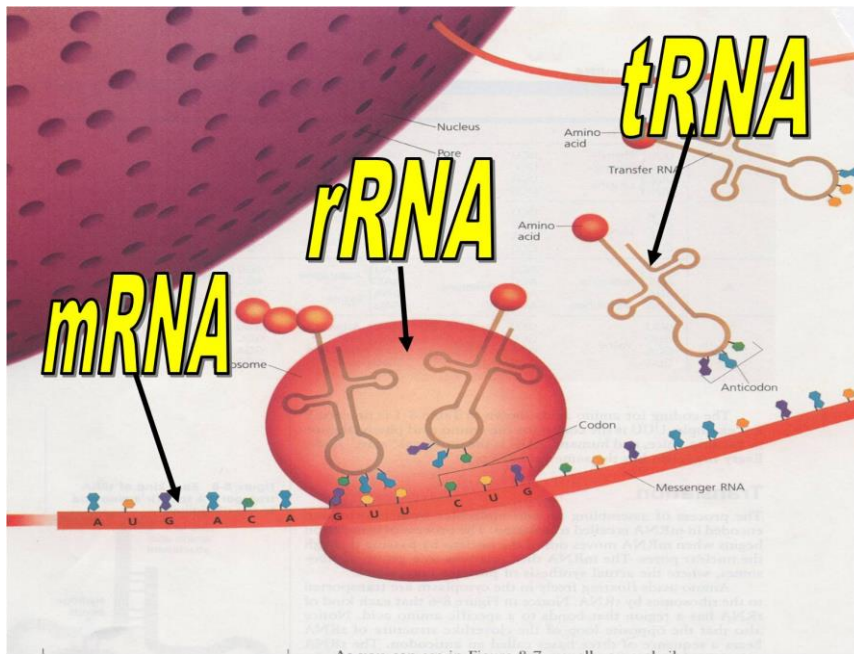
What is RNA?

What is RNA and how is it different?



- **RNA**: ribonucleic acid
- Carries out protein synthesis/translation
- Differences from DNA:
 - different sugar (*ribose*)
 - single strand
 - different base
 - Uracil instead of thymine

What are the three types of RNA?



Messenger RNA: (*mRNA*) carries nucleotide sequence from nucleus to ribosome

Transfer RNA: (*tRNA*) picks up amino acid in cytoplasm and carries them to ribosome

Ribosomal RNA: (*rRNA*) found in ribosome, joins mRNA and tRNA; forms protein

Transcription

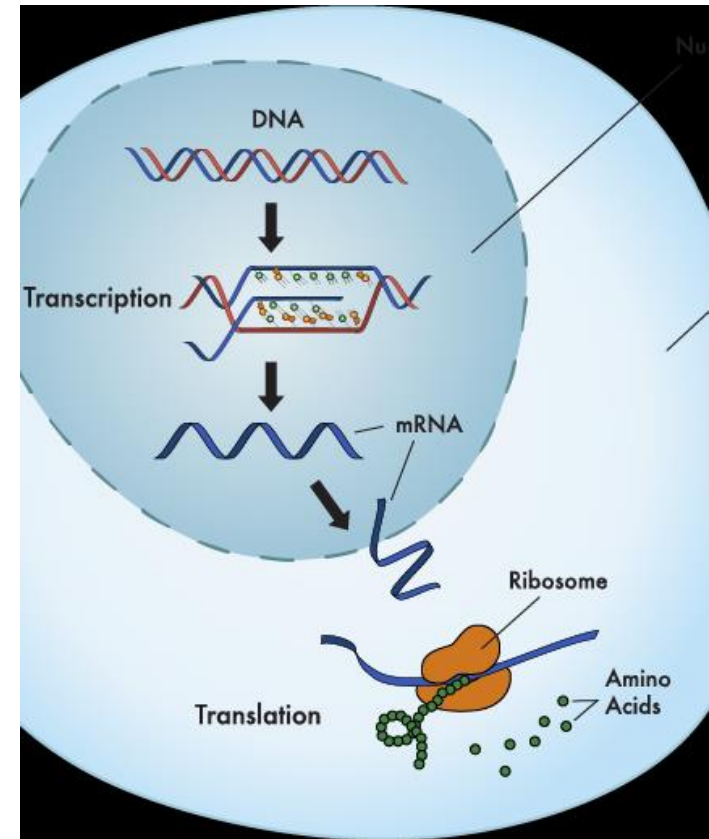
- **Transcription**- process that makes mRNA from DNA
- It works roughly the same as DNA replication
 1. DNA *unzips* into 2 separate strands
 - a) *DNA Helicase* is the enzyme that breaks H-bond
 2. Free floating RNA bases in the nucleus *pair up* w/unzipped DNA bases
 - a) G and C still pair up
 - b) U replaces T in the RNA
 3. The strand created is a strand of mRNA.
 4. DNA closes again.

Practice DNA to RNA

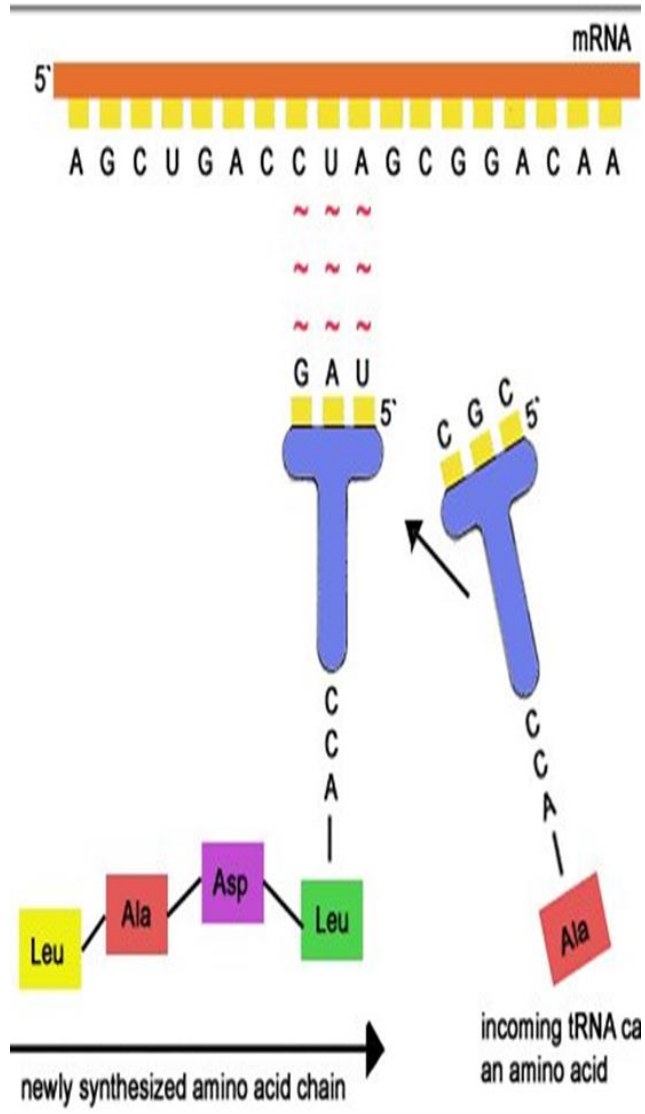
G C T A G C T A G C T A

Translation/Protein synthesis

1. After detaching from DNA the strand of mRNA leaves the nucleus and goes to the ribosome
 - a) The ribosome is made up of rRNA
2. The bases of mRNA is read in codons (groups of 3)
3. Each codon codes for an amino acid
4. rRNA tells the tRNA which amino acid to bring



Translation Cont.



5. tRNA 'knows' what amino acid to bring because it has the complementary RNA sequence.
 - a) Called an anticodon
6. The string of amino acids makes a protein