



# The Central Dogma

**Translation & Trascrption**

# FUN FACT ABOUT DNA

- Humans can completely copy their DNA in 8 hours

• DNA → RNA → Protein

- RNA is similar to DNA but it contains the sugar ribose instead of deoxyribose and the base uracil replaces thymine.

- Messenger RNA (mRNA) = chains that are complementary to a strand of DNA.
- Ribosomal RNA (rRNA) = associates with protein to form the ribosome
- Transfer RNA (tRNA) = transport amino acids to the ribosome.

- DNA is unzipped in the nucleus.
- RNA polymerase moves down the template DNA strand as the DNA unwinds.
- As the mRNA is made, Uracil is incorporated instead of thymine.
- Processed mRNA moves out of the nucleus and into the cytoplasm.

- The mRNA connects to the ribosome , and tRNA carries the amino acid methionine to the start codon. More tRNA carries amino acids to the ribosome according to the codons on the mRNA.
- **The mRNA in the ribosome catalyzes the bonds between amino acids.**

- The ribosome moves along the mRNA until it reaches a stop codon.
- **The mRNA is released from the tRNA, and the ribosome subunits disassemble.**

# The Code

- 3 base pairs in mRNA is called a codon.
- Each codon codes for a different amino acid
- There are 20 amino acids
- The only start codon is AUG
- There are 3 stop codons: UAA, UGA, UAG

# AUGGGUGAUCAAAAUAA

		Second Nucleotide Position			
		U	C	A	G
U	U	UUU Phenylalanine	UCU Serine	UAU Tyrosine	UGU Cysteine
		UUC Phenylalanine	UCC Serine	UAC Tyrosine	UGC Cysteine
		UUA Leucine	UCA Serine	<b>UAA STOP</b>	<b>UGA STOP</b>
		UUG Leucine	UCG Serine	<b>UAG STOP</b>	UGG Tryptophan
C	C	CUU Leucine	CCU Proline	CAU Histidine	CGU Arginine
		CUC Leucine	CCC Proline	CAC Histidine	CGC Arginine
		CUA Leucine	CCA Proline	CAA Glutamine	CGA Arginine
		CUG Leucine	CCG Proline	CAG Glutamine	CGG Arginine
A	A	AUU Isoleucine	ACU Threonine	AAU Asparagine	AGU Serine
		AUC Isoleucine	ACC Threonine	AAC Asparagine	AGC Serine
		AUA Isoleucine	ACA Threonine	AAA Lysine	AGA Arginine
		AUG Methionine	ACG Threonine	AAG Lysine	AGG Arginine
G	G	GUU Valine	GCU Alanine	GAU Aspartate	GGU Glycine
		GUC Valine	GCC Alanine	GAC Aspartate	GGC Glycine
		GUA Valine	GCA Alanine	GAA Glutamate	GGA Glycine
		GUG Valine	GCG Alanine	GAG Glutamate	GGG Glycine

transcription process