

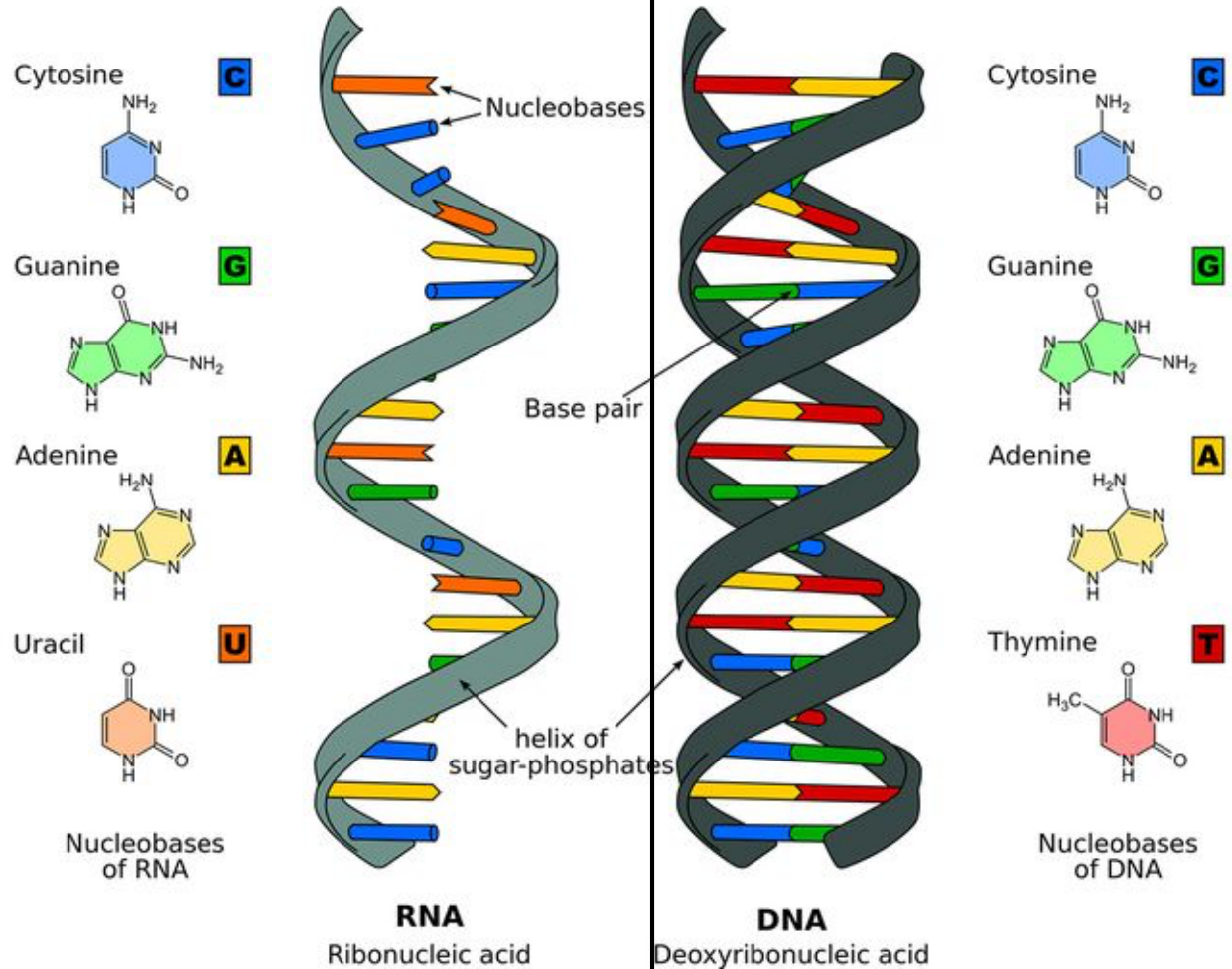
# Stage 1 Biology

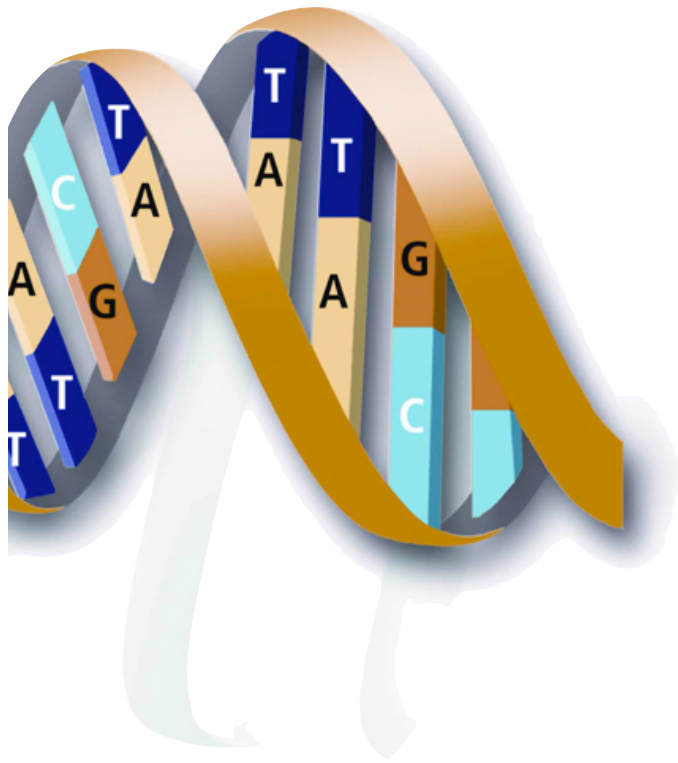
## *Transcription & Translation Review*

# DNA vs RNA

## RNA

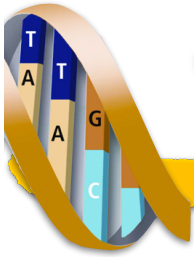
- single stranded (one polynucleotide strand)
- Ribose instead of deoxyribose
- Uracil replaces Thymine
- shorter than DNA strands
- \*Bases can form h-bonds with DNA!
- \*RNA often folds back on itself in 3D shapes



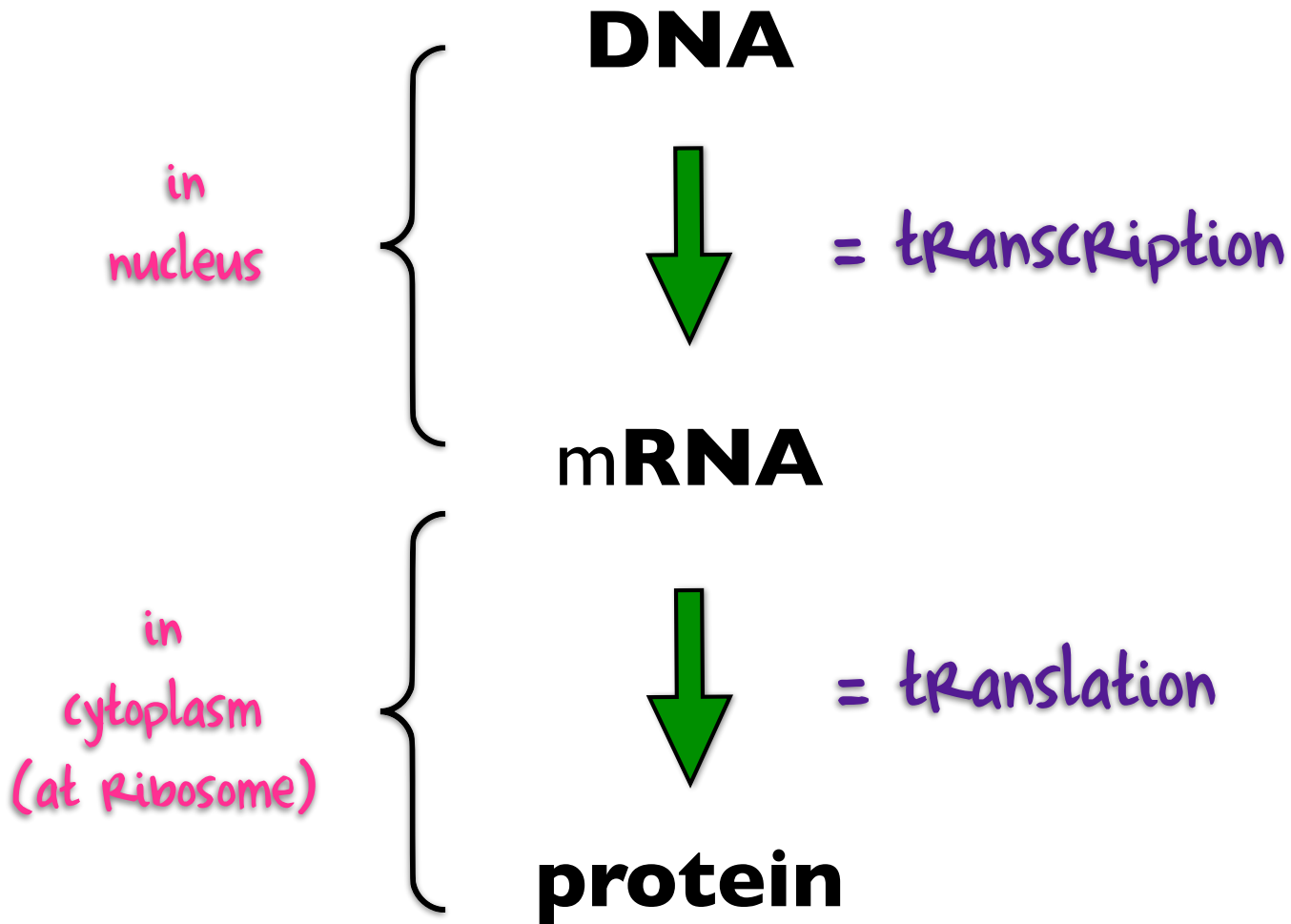


# Transcription & Translation



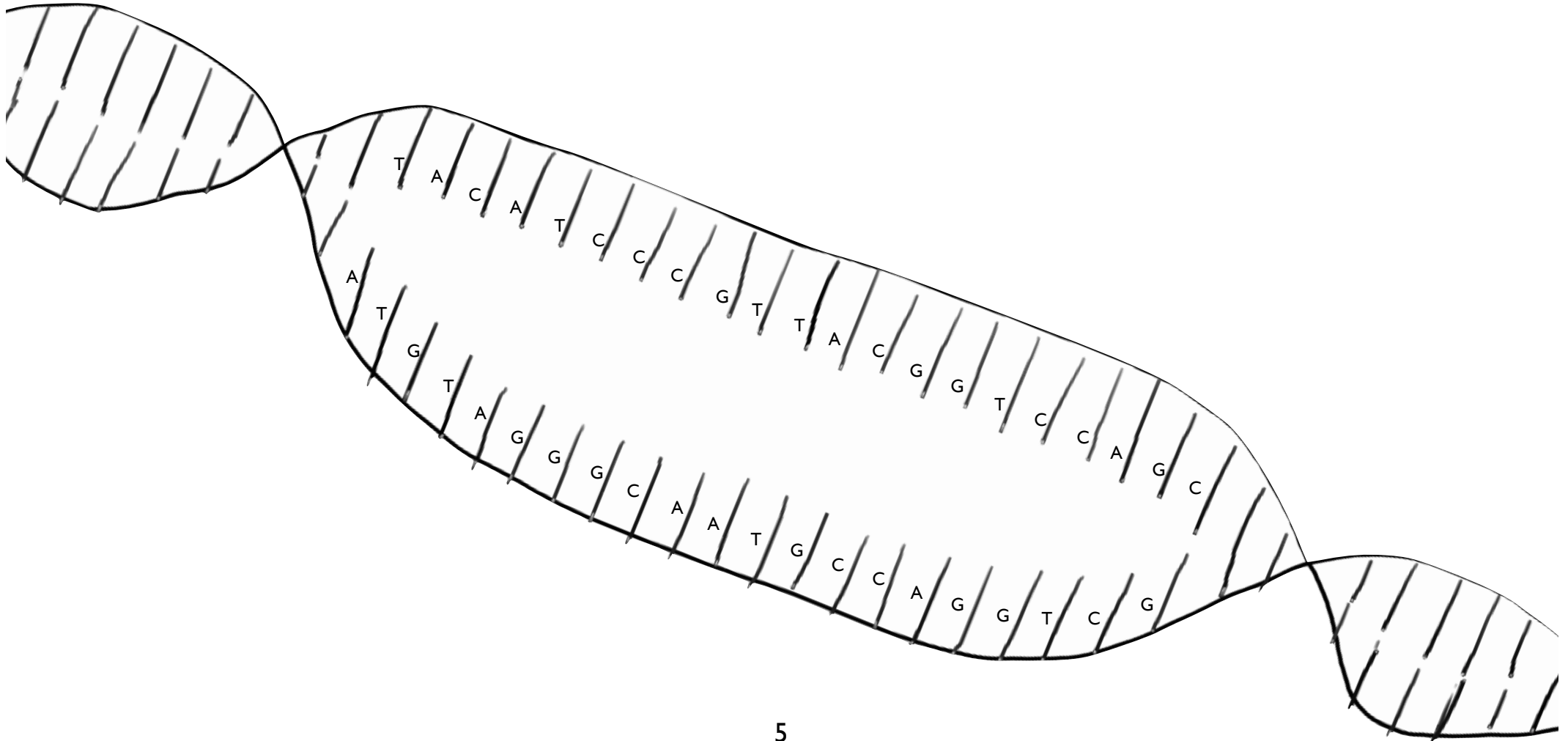


# The Central Dogma of Cell Biology

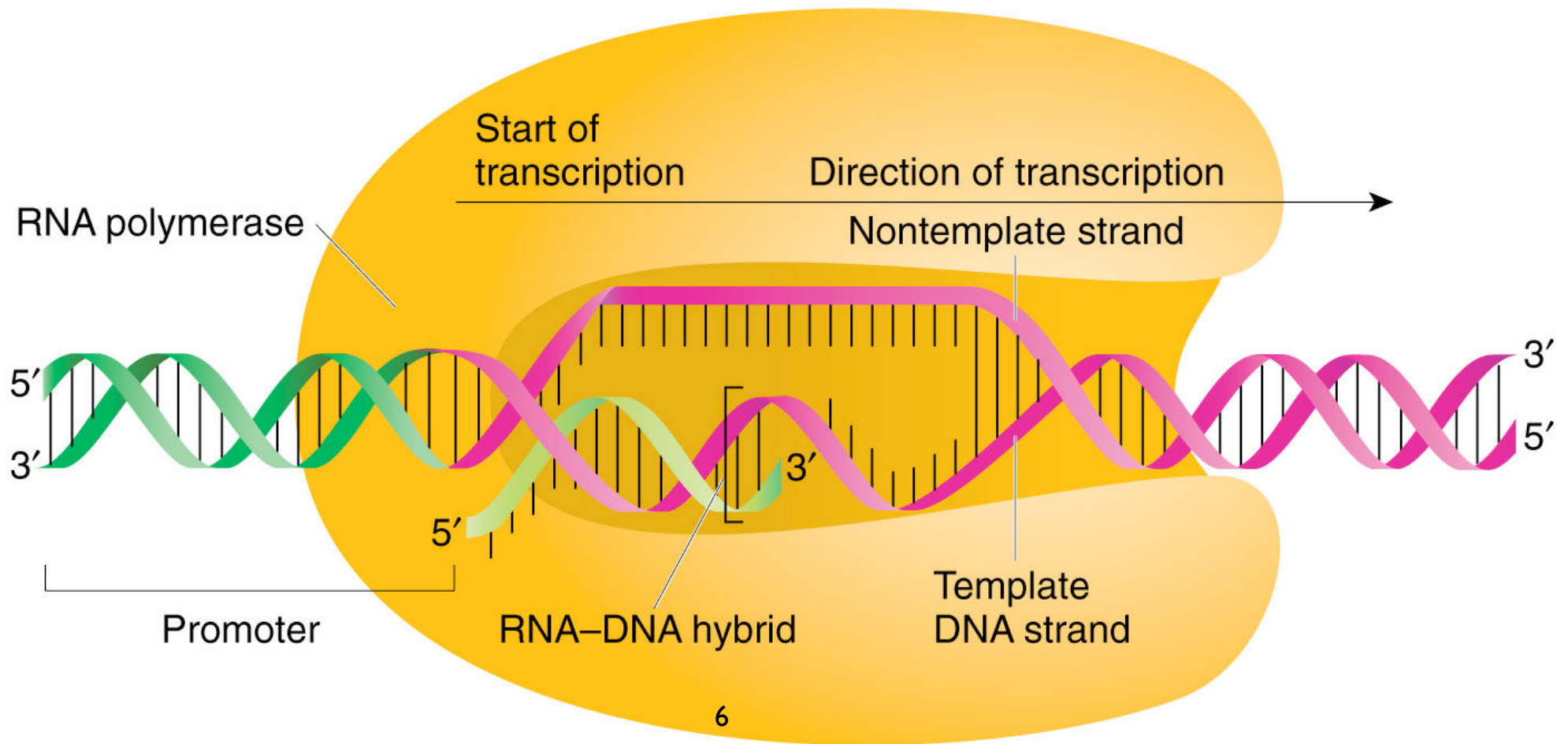


# TRANSCRIPTION (DNA to mRNA)

- \* mRNA is single stranded
- \* mRNA has U instead of T
- \* mRNA has ribose instead of deoxyribose
- \* 'm' = 'messenger'



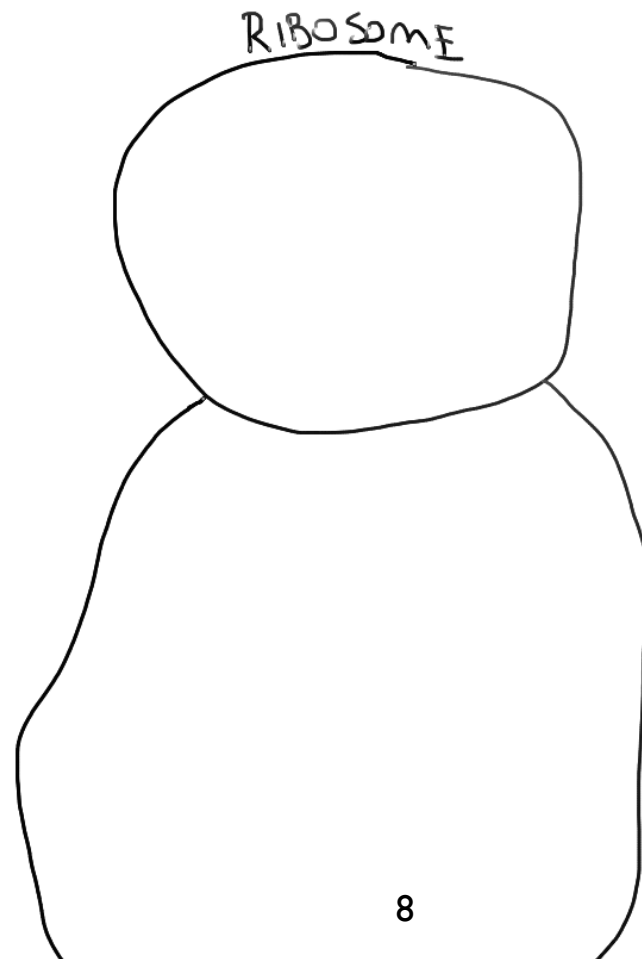
# RNA Polymerase



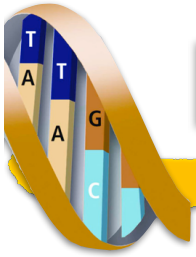
# **DNA Polymerase vs RNA Polymerase**

# TRANSLATION (mRNA to protein)

- \* tRNA carries aa's to ribosome
- \* every 3 nucleotides in mRNA code for one aa
- \* aa's are joined to form long protein chain



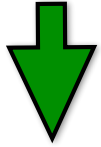




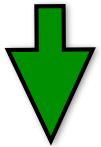
# Example Question

**DNA** triplets:  
(one side - template strand)

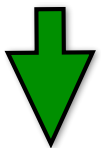
T A C A A A G C G



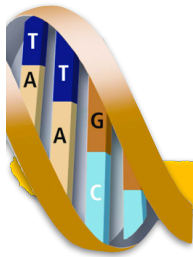
**mRNA** codon:



**tRNA** anti-codon:



**protein** aa's:



# mRNA Codon Table

Second letter

		Second letter					
		U	C	A	G		
First letter	U	UUU } Phe UUC } UUA } Leu UUG }	UCU } UCC } Ser UCA } UCG }	UAU } Tyr UAC } <b>UAA Stop</b> <b>UAG Stop</b>	UGU } Cys UGC } <b>UGA Stop</b> UGG Trp	U C A G	
	C	CUU } CUC } Leu CUA } CUG }	CCU } CCC } Pro CCA } CCG }	CAU } His CAC } CAA } Gln CAG }	CGU } CGC } Arg CGA } CGG }	U C A G	
	A	AUU } AUC } Ile AUA } <b>AUG Met</b>	ACU } ACC } Thr ACA } ACG }	AAU } Asn AAC } AAA } Lys AAG }	AGU } Ser AGC } AGA } Arg AGG }	U C A G	
	G	GUU } GUC } Val GUA } GUG }	GCU } GCC } Ala GCA } GCG }	GAU } Asp GAC } GAA } Glu GAG }	GGU } GGC } Gly GGA } GGG }	U C A G	

Third letter

Ala: Alanine  
Arg: Arginine  
Asn: Asparagine  
Asp: Aspartic acid  
Cys: Cysteine

Gln: Glutamine  
Glu: Glutamic acid  
Gly: Glycine  
His: Histidine  
Ile: Isoleucine

Leu: Leucine  
Lys: Lysine  
Met: Methionine  
Phe: Phenylalanine  
Pro: Proline

Ser: Serine  
Thr: Threonine  
Trp: Tryptophane  
Tyr: Tyrosine  
Val: Valine



# Summary

## Transcription

- ➔ in nucleus
- ➔ DNA to mRNA

## DNA

- ➔ double stranded
- ➔ has bases A, C, T, G
- ➔ long strands
- ➔ deoxyribose

## Translation

- ➔ in cytoplasm
- ➔ mRNA to protein

## mRNA

- ➔ single stranded
- ➔ has bases A, C, U, G
- ➔ short segments
- ➔ ribose