

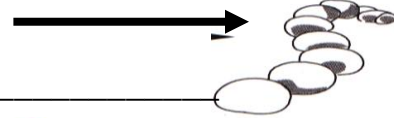
DNA NOTES: Protein Production (Biology)

But first, a little bit of review...

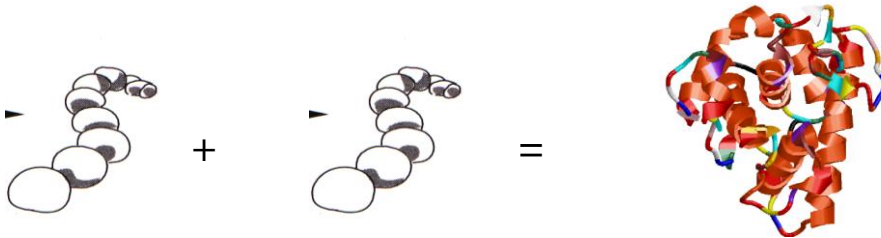
● You and your cells are mostly made of _____

● Proteins are made of _____ (20 different kinds)

● AA + AA + AA + AA = _____



● Polypeptide + Polypeptide = _____



● Different _____ = different _____ = different _____

Differences between DNA and RNA

● **DeoxyriboNucleic Acid**

● _____

● 5-C sugar is _____

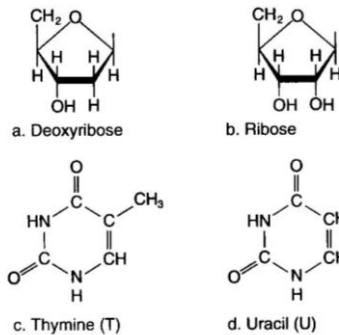
● Nitrogen bases:

■ _____

■ _____

■ _____

■ _____



● **RiboNucleic Acid**

● _____

● 5-C sugar is _____

● Nitrogen bases:

■ _____

■ _____

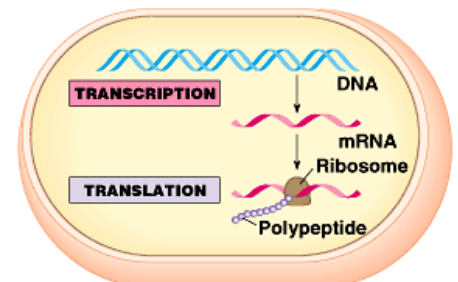
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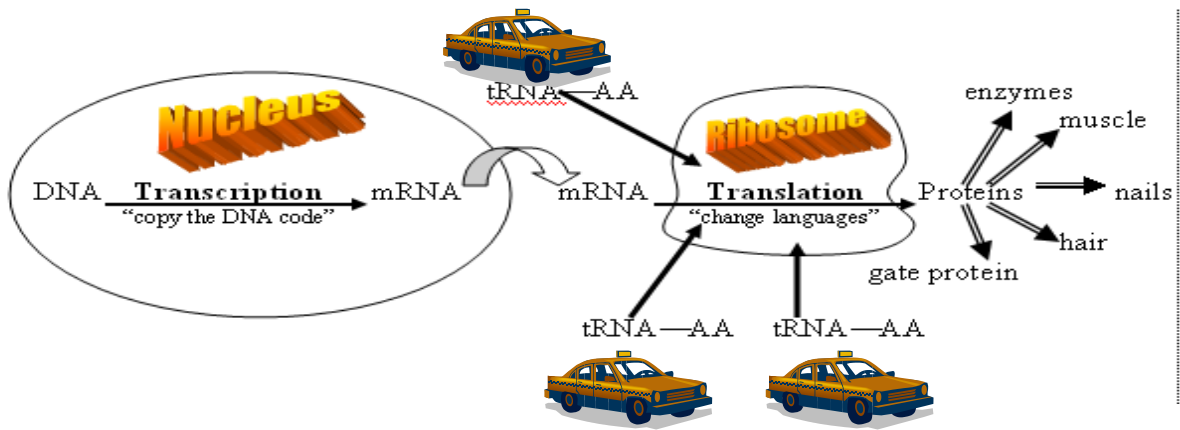
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Protein Production: The BIG PICTURE

Gene = _____ of DNA code with instructions for making a _____

Each gene has a code for making 1 specific _____

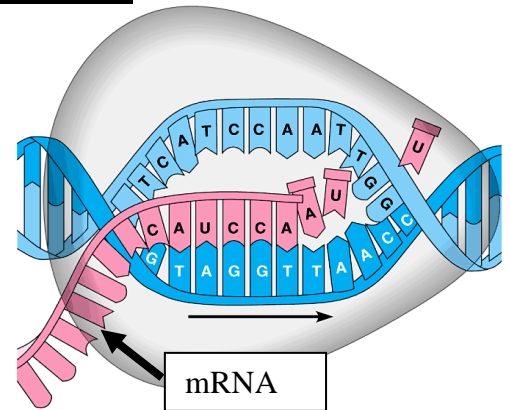




- Recent studies of human DNA indicate there are ~ _____ **genes** in one blueprint.
- Protein Production is a 2-part story:
 - Part I = _____ (in the _____)
 - Part II = _____ (at a _____)

Protein Production: Part I: Transcription

- The DNA code is copied into _____
- In transcription, the DNA helix _____
- RNA nucleotides line up along one strand of the DNA following the _____ rules
- After the gene code is copied into _____, the single-stranded mRNA _____ and the DNA strands _____
- Next, the mRNA carries a copy of the gene code instructions from the _____



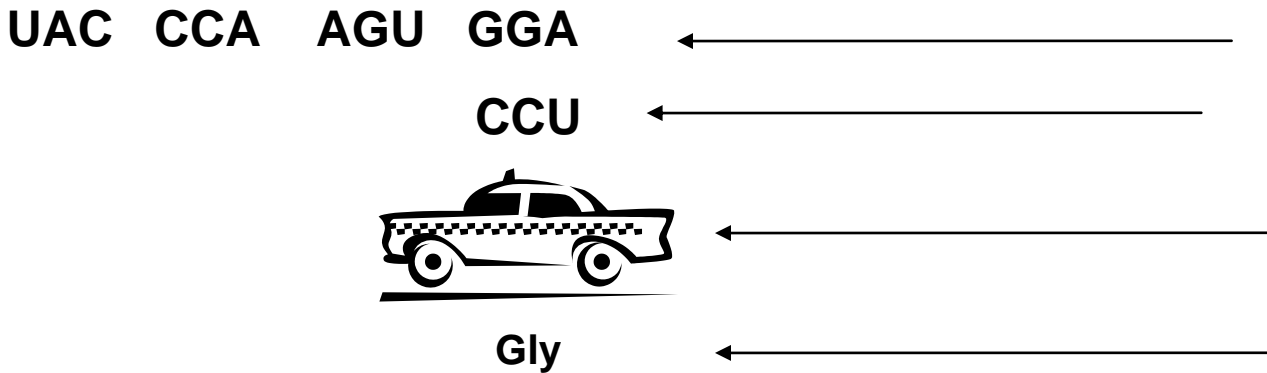
FIRST BASE	SECOND BASE				THIRD BASE
	U	C	A	G	
U	UUU Phe	UCU	UAU Tyr	UGU Cys	U
	UUC	UCC	UAC	UGC	C
	UUA Leu	UCA	UAA Stop	UGA Stop	A
	UUG	UCG	UAG Stop	UGG Trp	G
C	CUU	CCU	CAU His	CGU	U
	CUC	CCC	CAC	CGC	C
	CUA Leu	CCA Pro	CAA Gln	CGA Arg	A
	CUG	CCG	CAG	CGG	G
A	AUU	ACU	AAU Asn	AGU Ser	U
	AUC Ile	ACC	AAC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

Codons in mRNA					
First base	Second base				Third base
	U	C	A	G	
U	UUU Phenylalanine UUC UUA Leucine UUG	UCU Serine UCC UCA UCG	UAU Tyrosine UAC UAA Stop UAG	UGU Cysteine UGC UGA -Stop UGG -Tryptophan	U C A G
C	CUU Leucine CUC CUA CUG	CCU Proline CCC CCA CCG	CAU Histidine CAC CAA Glutamine CAG	CGU Arginine CGC CGA CGG	U C A G
A	AUU Isoleucine AUC AUA AUG -Start	ACU Threonine ACC ACA ACG	AAU Asparagine AAC AAA Lysine AAG	AGU Serine AGC AGA Arginine AGG	U C A G
G	GUU Valine GUC GUA GUG	GCU Alanine GCC GCA GCG	GAU Aspartic Acid GAC GAA Glutamic Acid GAG	GGU Glycine GGC GGA GGG	U C A G

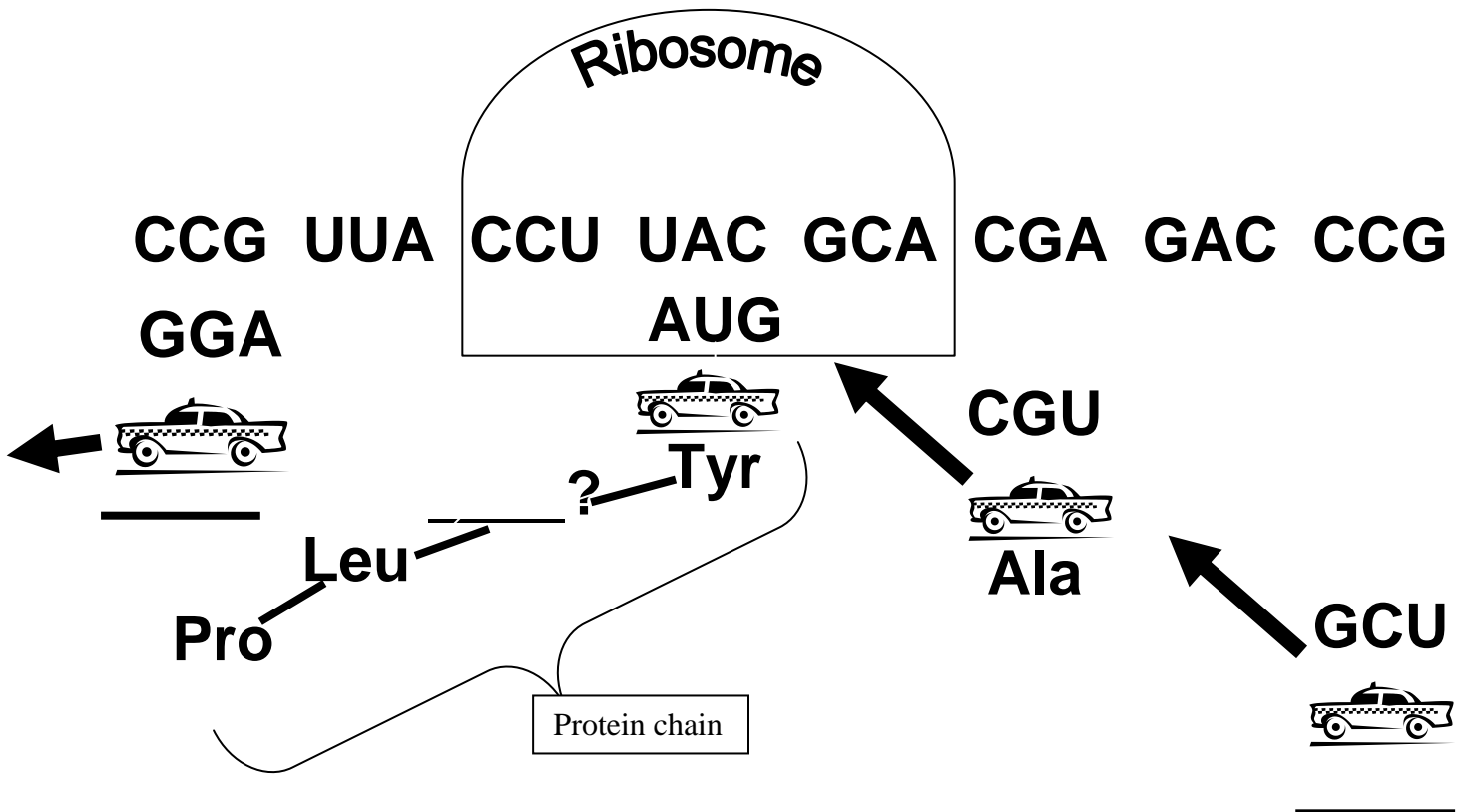
Part II: Translation

convert from mRNA language into _____ language

- The mRNA is read _____ letters at a time (_____)
- Each CODON represents one specific _____
- There are _____ possible 3 letter combinations BUT only _____ amino acids....
- SO, some Codons code for more than one amino acid
- Once the mRNA reaches the _____, and the _____ are read,
Transfer RNA (tRNA) “_____” service delivers the correct _____ to the ribosome



- tRNA binds to the mRNA CODON with its matching 3-letter _____
- tRNA releases its _____ “passenger” which bonds to other AA to make a _____
- The _____ tRNA leaves the ribosome to pick up other _____ passengers
- The protein is completed when a _____ codon is read



■