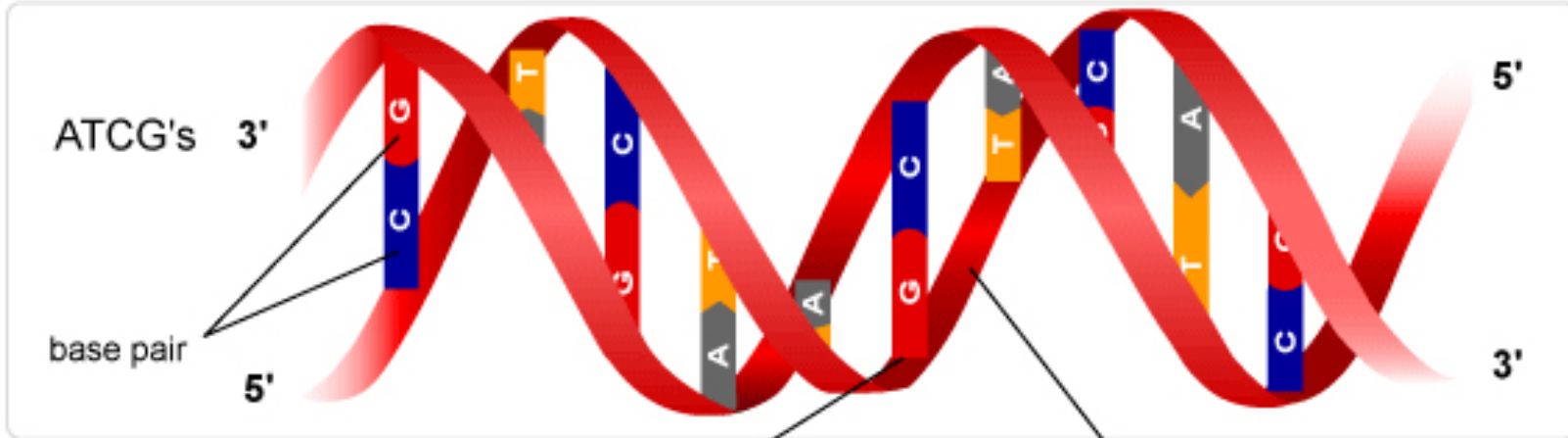


Minds On

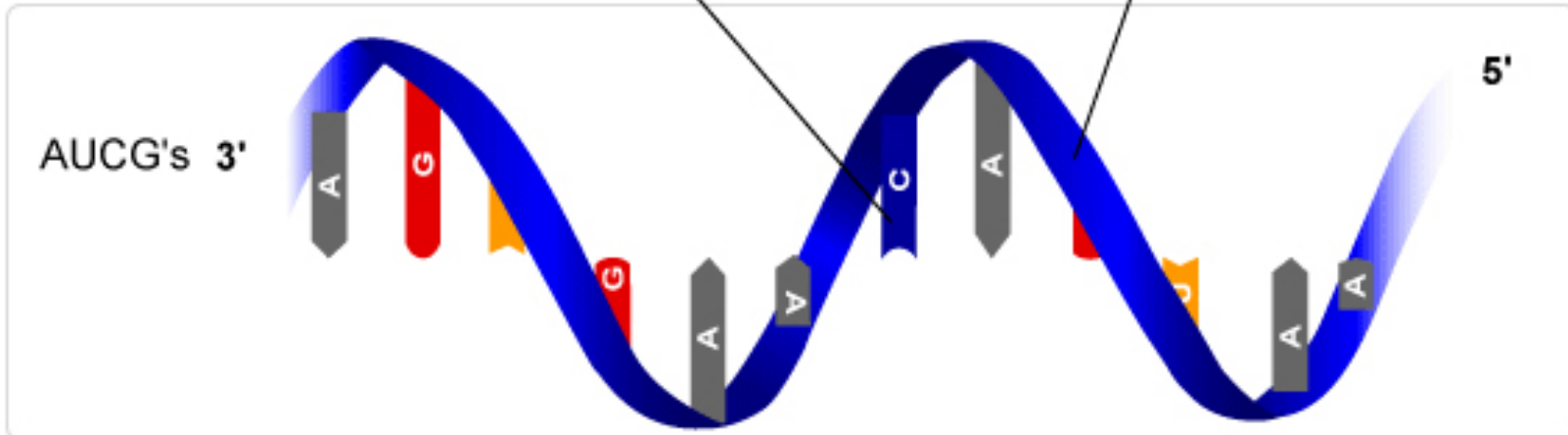
DNA

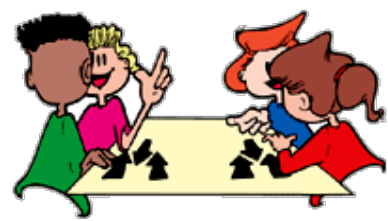


Nitrogenous
Bases

Sugar Phosphate
Backbone

RNA





UAG = Stop (period) CCG = is CGC = water
AUG = Initiator (Start) CCU = subject CGG = every
AAA = Your CGA = drink CGU = day
AAC = mother AAG = wears AAU = dresses
ACG = funny ACC = have ACU = dog
ACA = breath AGA = the AGG = are
AGU = Beatles AGC = best AUA = rock
AUC = band AUU = an CAA = old
CAC = rubber CAG = breaks CAU = pulled
CCA = when CCC = Biology CUA = I
CUC = love CUG = roll CUU = music
GAA = all GAC = demented GAG = puppies
GAU = and GCA = so GCC = much
GCG = fun GCU = education GGA = door
GGC = to GGG = future GGU = father
GUA = a GUC = dress GUG = brother
GUU = nothing UAA = we UAC = in
UAU = this UCA = together UCC = must
UCG = be UCU = informed UGA = around
UGC = you UGG = read UGU = little
UUA = DNA UUC = code UUG = for
UUU = life

Protein Synthesis

(i.e., making proteins)



DNA



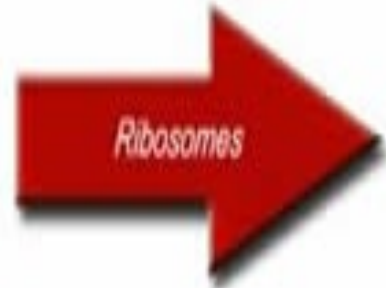
Transcription



RNA



Translation

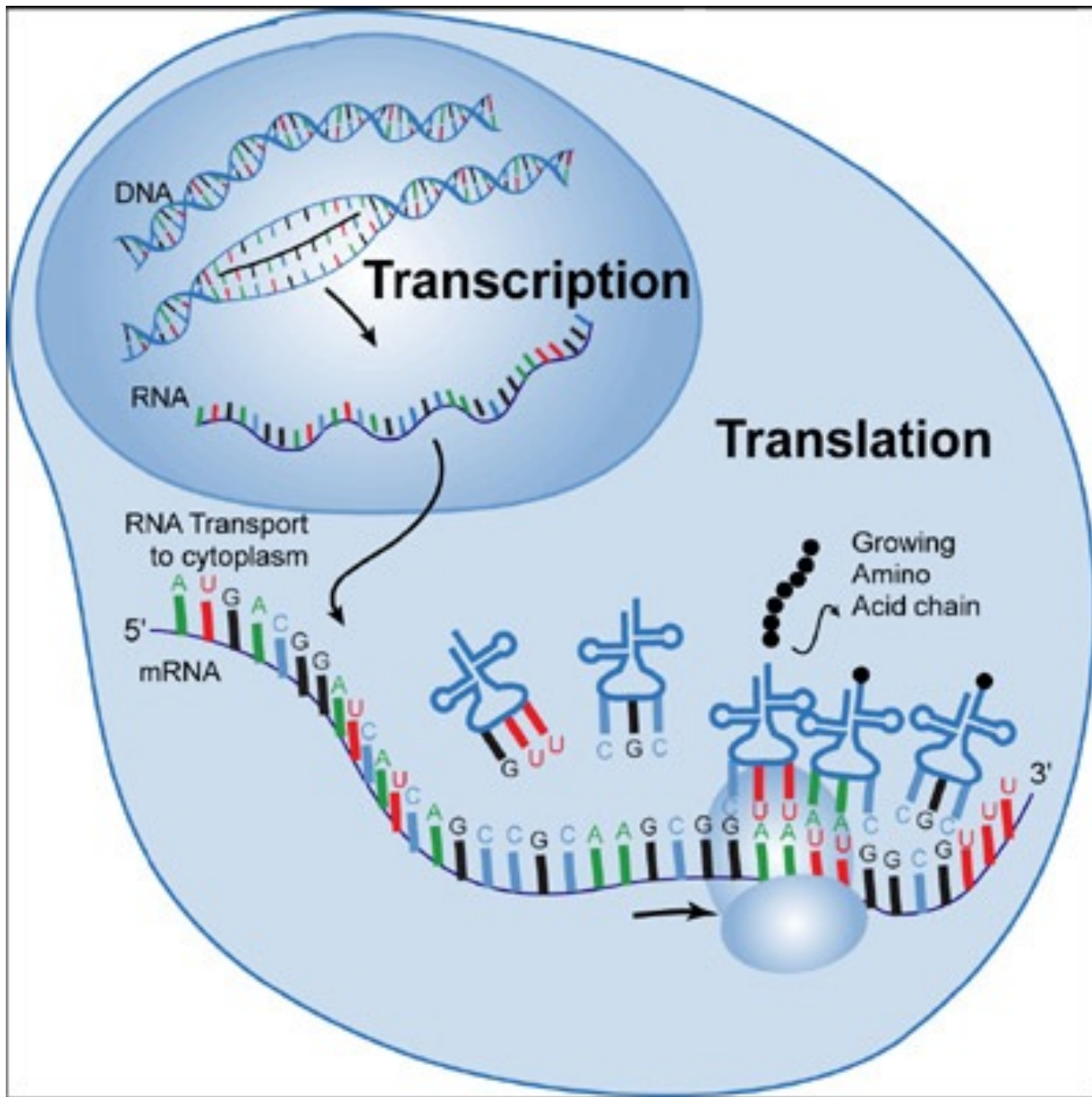


Protein



From Gene to Protein...

<http://vimeo.com/25051231>



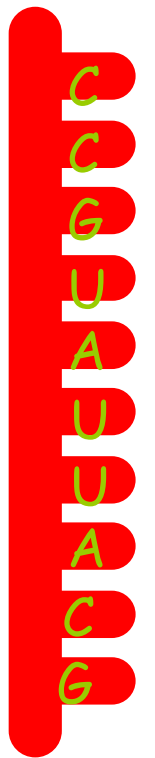
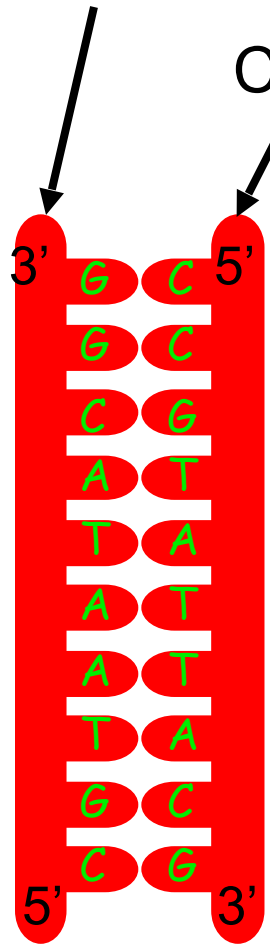
Transcribed

Translated

GENE

Template strand

Coding strand



Codon



Amino Acid.

Codon

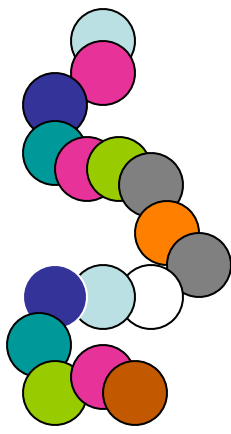


A. A.

Codon



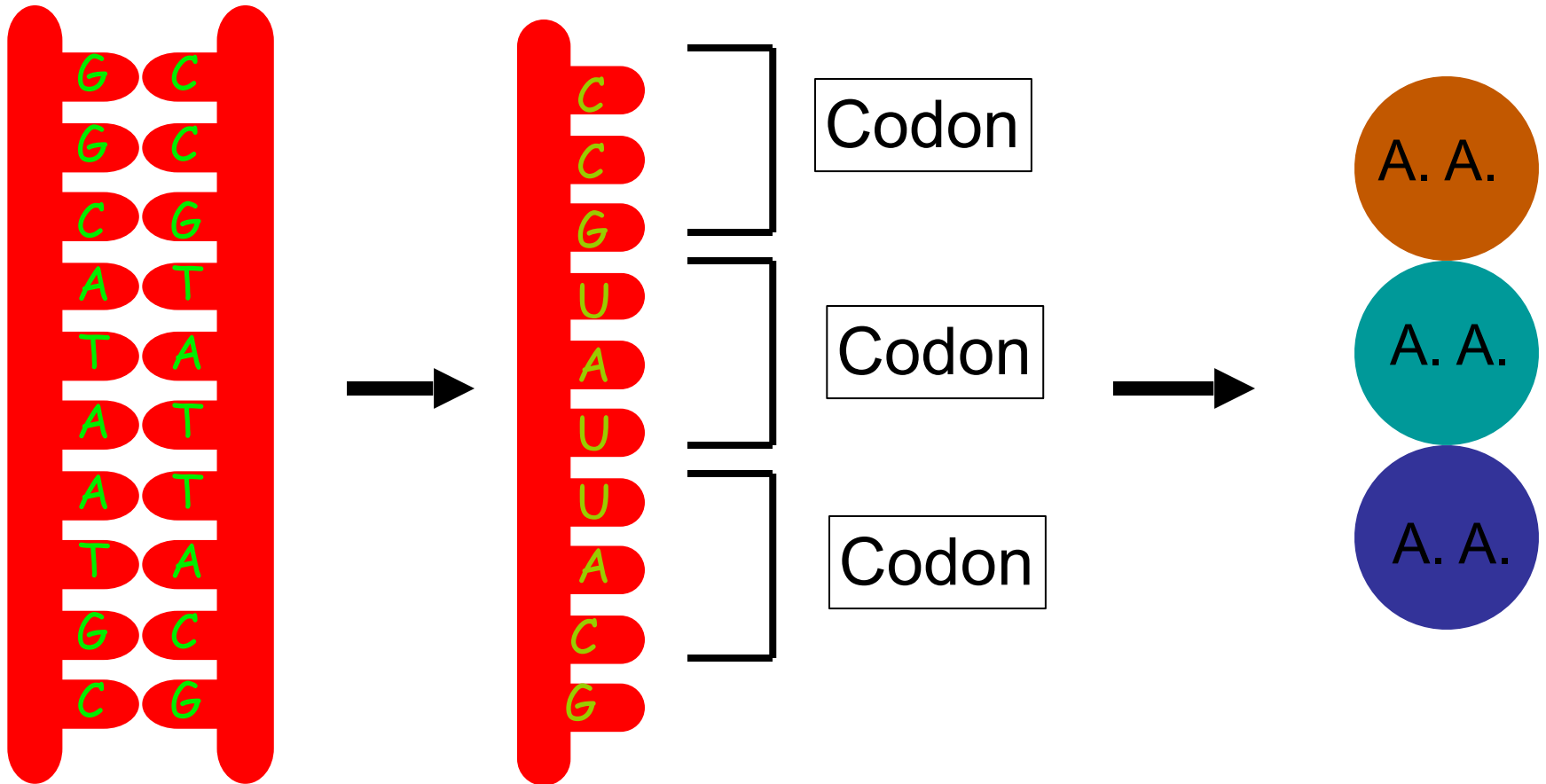
A. A.



DNA

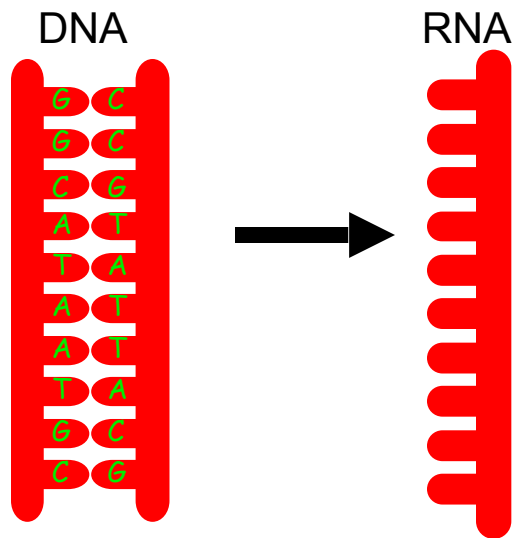
mRNA

- in humans there approximately 3 billion base pairs found in 23 pairs of chromosomes
- some sequence are called genes and are recipes for cooking up proteins
- In a gene every 3 base pairs are words in the recipe called = codons (codons code for an amino acids)



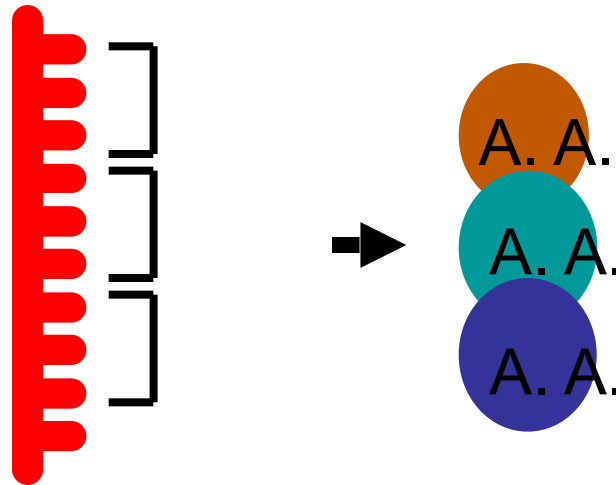
The Central Dogma

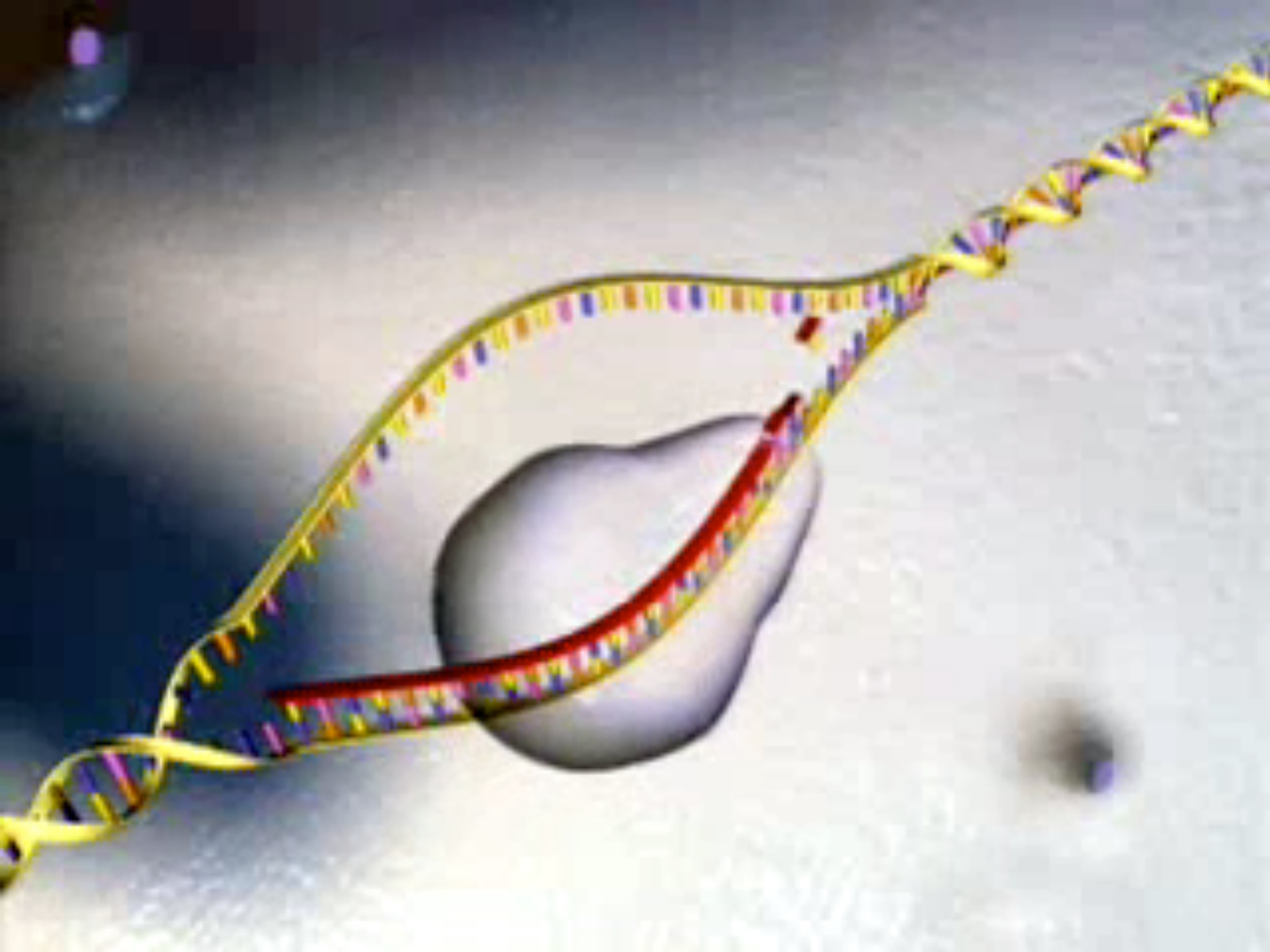
- describes the flow of information from DNA to RNA to protein:
- **transcription** - DNA to mRNA

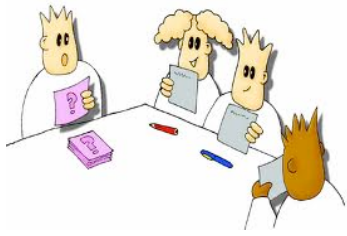


The Central Dogma

- describes the flow of information from DNA to RNA to protein:
- **transcription** - DNA to mRNA
- **translation** - mRNA to polypeptide (protein)







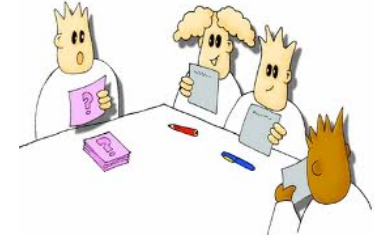
Transcribe the DNA in mRNA...
(hint: **build** in a 5'-3' direction)

3' TAC CAG AAC ACT ACA ' 5 Template

5' GGT TCA GTA ATA CAT 3' Template

Genetic Code (pg 317)

		Second Letter				
		U	C	A	G	
1st letter	U	UUU Phe UUC UUA Leu UUG	UCU UCC Ser UCA UCG	UAU Tyr UAC UAA Stop UAG Stop	UGU Cys UGC UGA Stop 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 AUG Met	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
						3rd letter



Translate the following RNA molecules

1. What do the following code for:

ACA

GCC

GGA

2. What is special about:

AUG?

UAA, UAG, UGA?

3. Write a code for:

Met - Gln - Tyr - Val

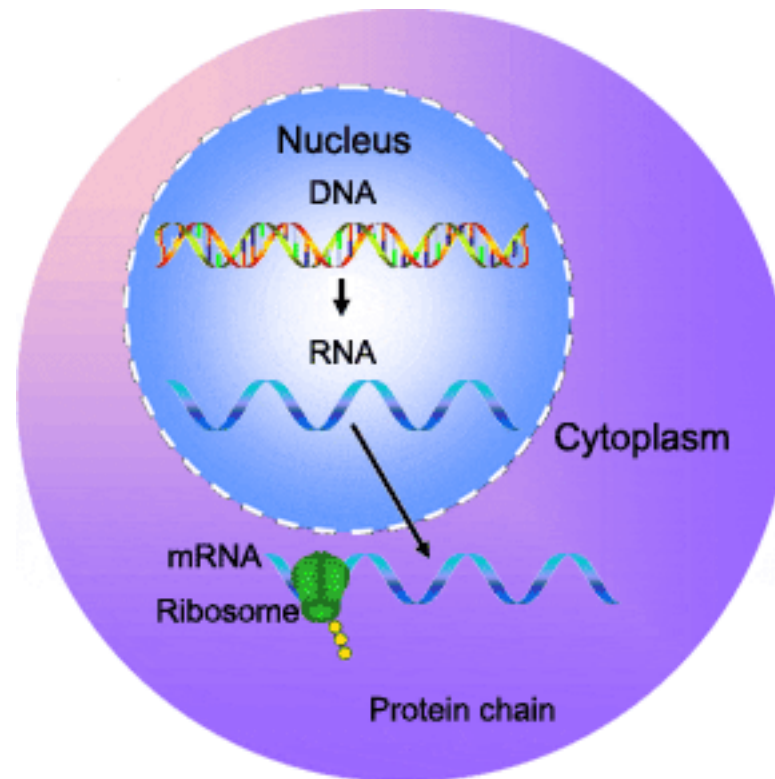
4. Translate these RNA strands

3' GGUAGAGUA 5'

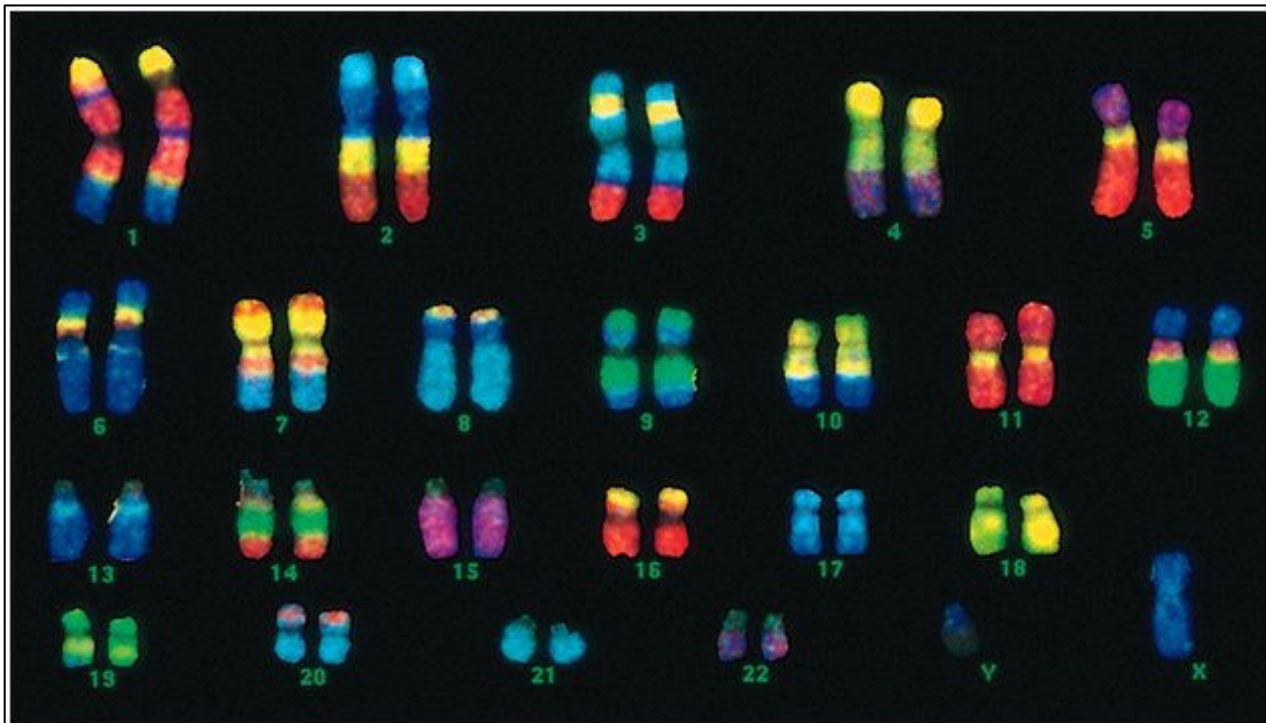
5' AUGCCUUGA 3'

5' AUGGGUAAG 3'

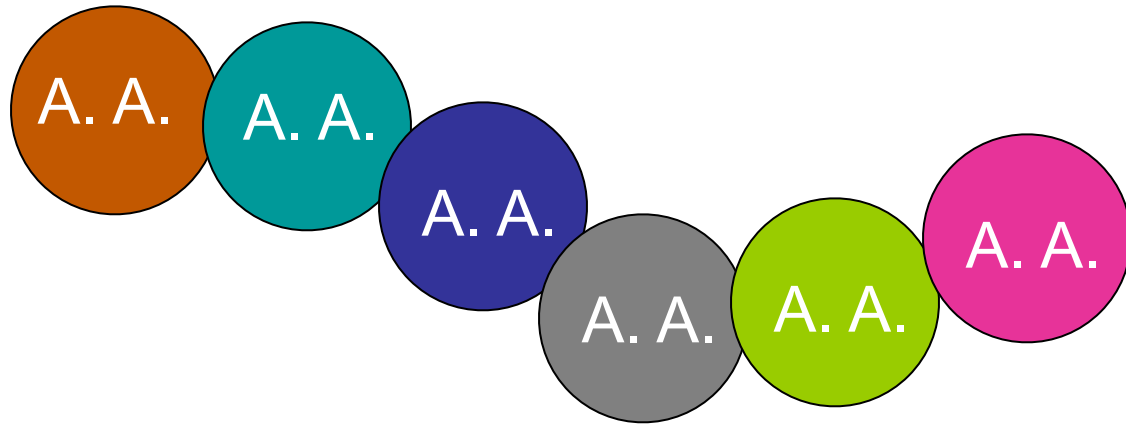
Protein Synthesis an Overview



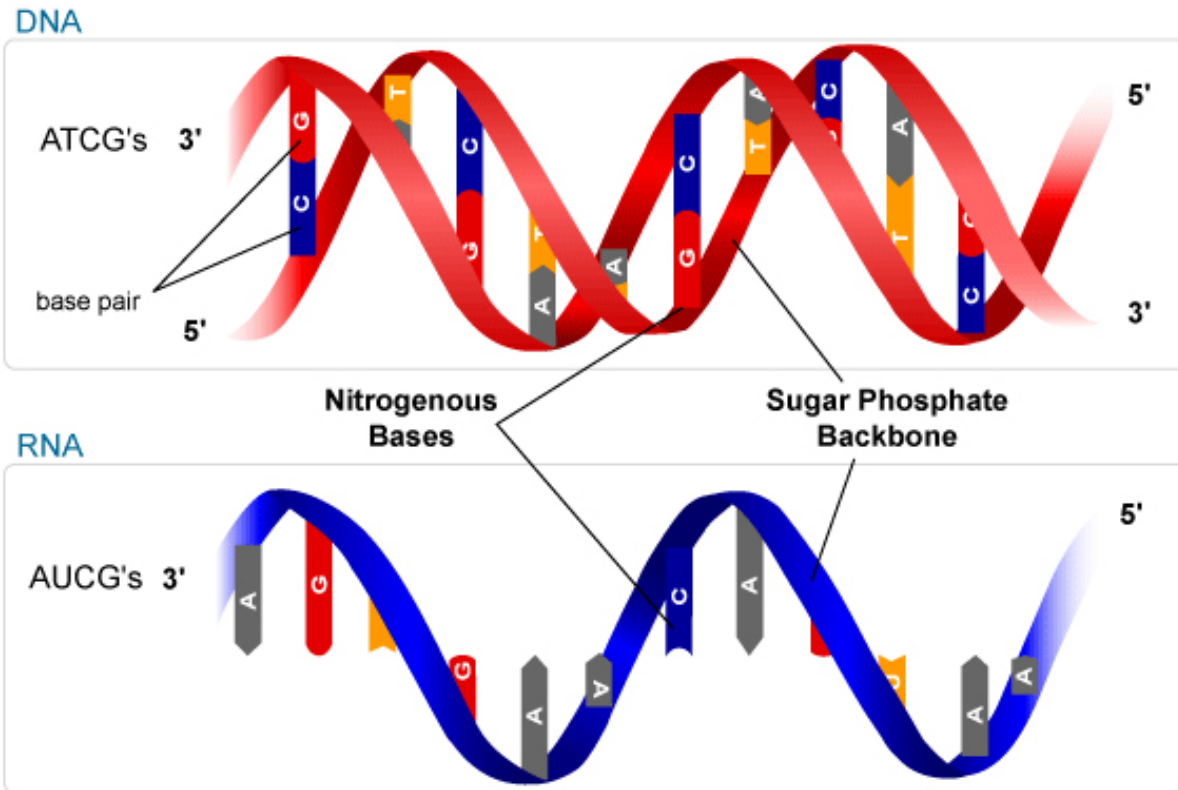
- human DNA has approx. 23 000 gene recipes on human all the chromosomes



- sections of chromosomes that contain one set of instruction for making a protein = gene



DNA & RNA



Types of RNA

- **messenger RNA (mRNA)**

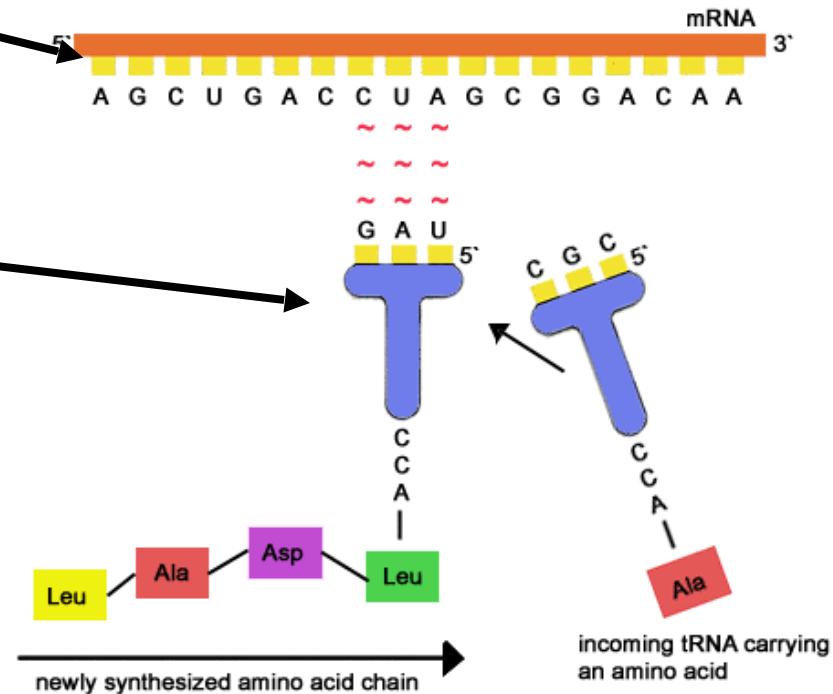
(transcribed code)

- **transfer RNA (tRNA)**

(brings the amino acid materials)

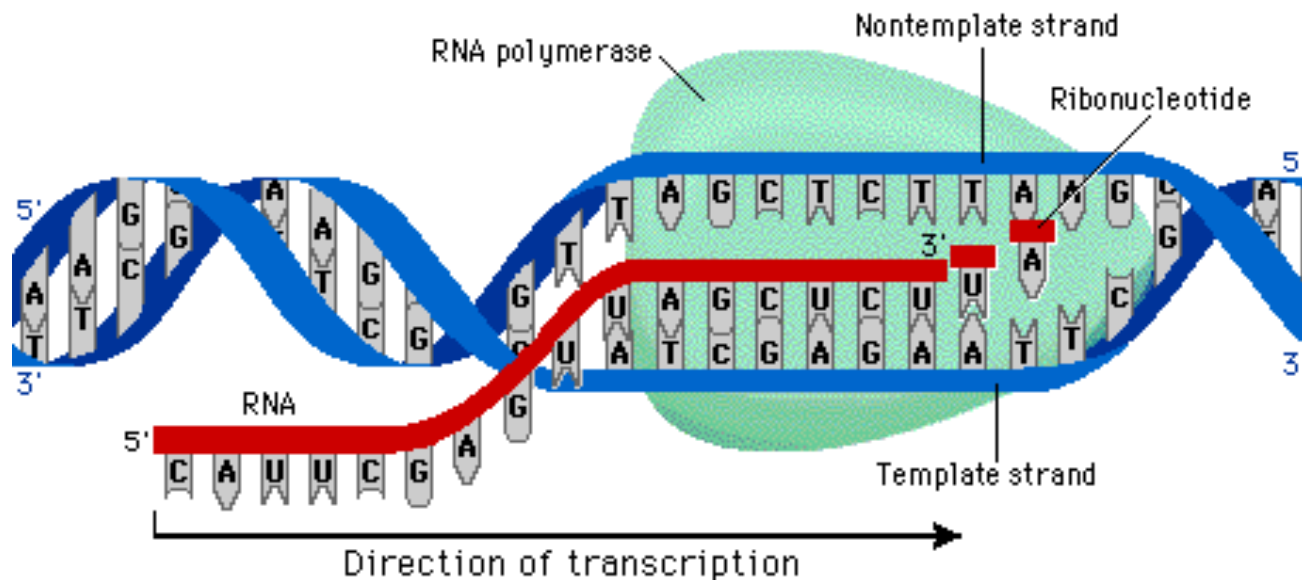
- **ribosomal RNA (rRNA)**

(structural makeup of ribosomes)



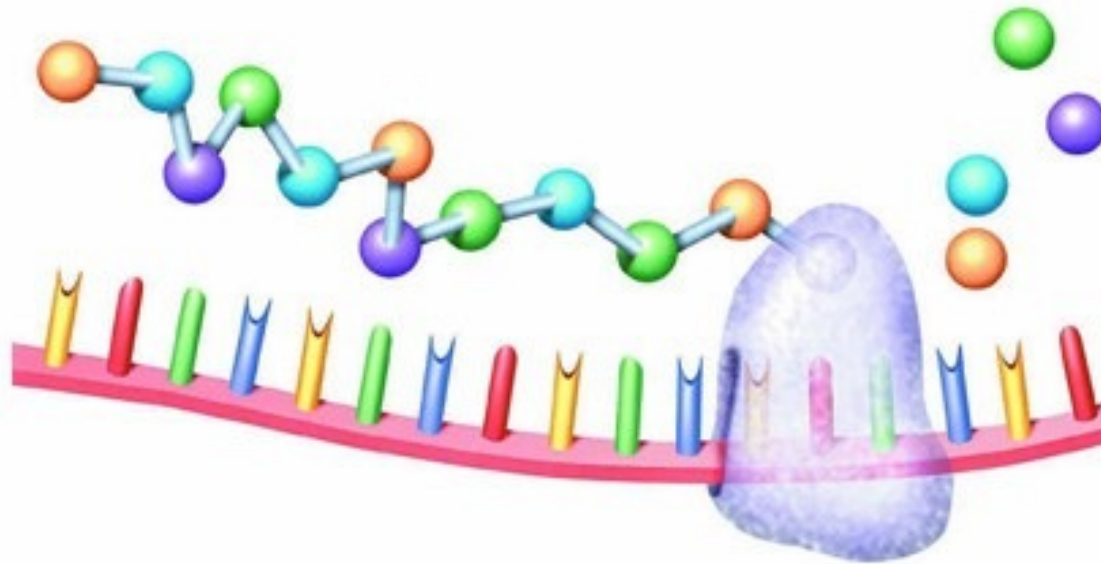
Overview of Transcription

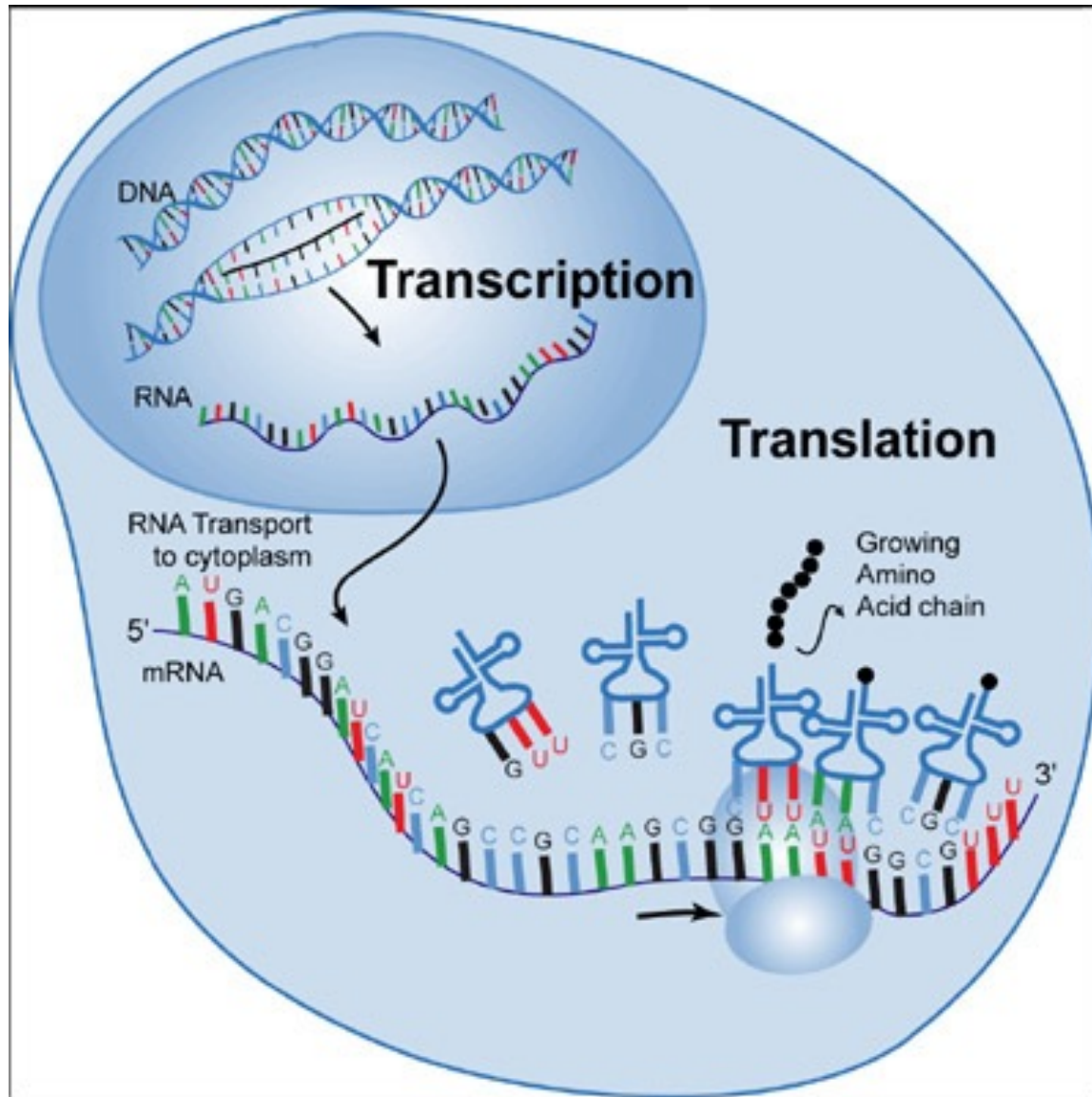
- RNA polymerase creates mRNA molecule complementary to template strand of DNA



Overview of Translation

- ribosome translates mRNA and assembles an amino acid chain using tRNA





Genetic Code Terms

- **Codon-** three letter codes
- **start codon- AUG** start reading sequence on mRNA
- **stop codons- UAA UAG UGA** Stop reading sequence.

Try to decode the following DNA gene sequence into amino acid polypeptide chain.

TEMPLATE STRAND

3' GCTATATACGATTTCTTGGGCCCCATTGCGAAA 5'

Hint ...

First- Transcribe

then

Second- Translate

