

# VIDEO SUMMARIES: GENE EXPRESSION

## PROTEINS AND DNA

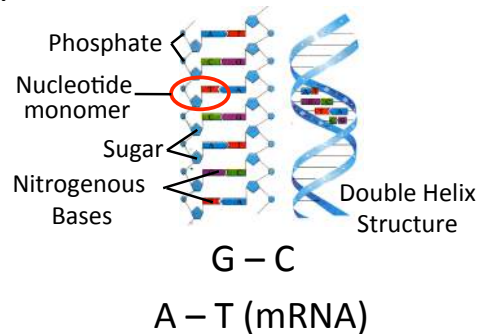
What you need to know:

**Protein:** long (polypeptide) chains made up of amino acids. These perform many of the functions required in our body.

**Uses:** Enzymes and Structures

**DNA:** genetic code in our bodies and this code is the design for our proteins

Protein Synthesis for transcription and translation



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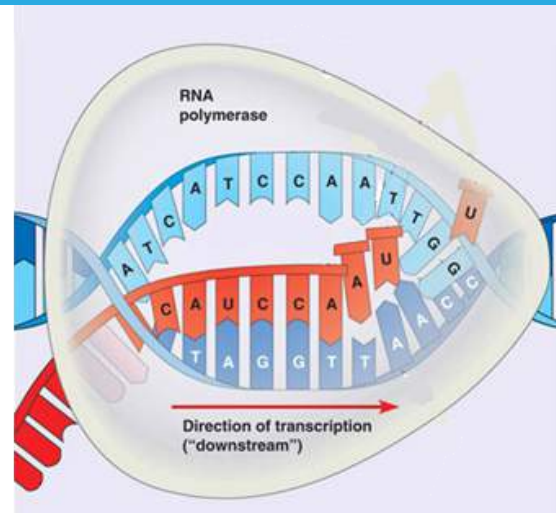
## TRANSCRIPTION

What you need to know:

**mRNA** is messenger RNA

1. RNA-P unwinds
2. Start Code
3. End Code
4. Template Strand
5. Complementary Strand

**mRNA** T → U



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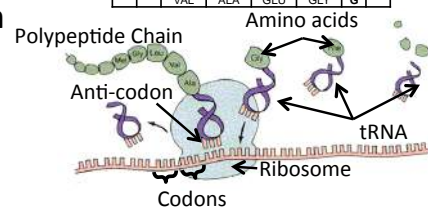
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## TRANSLATION

What you need to know:

1. **mRNA** is made up of codons (3 letters each)
2. 64 codons and 20 different amino acids
3. "Redundancy due to degeneracy within the code"
4. Each codon is matched with an anti-codon
5. tRNA has the anti-codon and transports the amino acid
6. This occurs at Ribosome

		SECOND CODON ELEMENT				THIRD CODON ELEMENT
		U	C	A	G	
FIRST CODON ELEMENT	U	PHE PHE LEU	SER SER SER	TYR TYR STOP	CYS CYS STOP	U C A G
	C	LEU LEU LEU	PRO PRO PRO	HIS HIS GLU	ARG ARG ARG	U C A G
	A	ILE ILE ILE	THR THR THR	ASP ASP LYS	SER SER ARG	U C A G
	G	VAL VAL VAL	ALA ALA ALA	ASP ASP GLU	GLY GLY GLY	U C A G



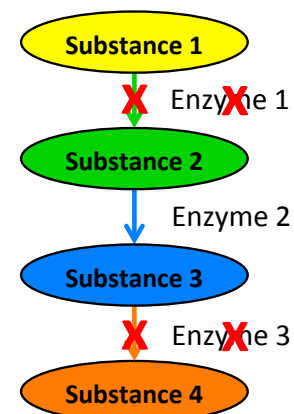
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## METABOLIC PROCESSES

What you need to know:

1. A metabolic pathway is a set of reactions within a cell that turns one substance into another
2. Enzymes help at each stage
3. If there is no enzyme there is no pathway
4. Caused by absent or non functioning proteins (enzymes)
5. Affected parents can have healthy offspring



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## ENVIRONMENTAL EFFECTS

### What you need to know:

1. Mutagen: an agent that causes genetic mutation (change in structure)
2. Mutagens affect genotype by changing the DNA structure: Swap, Deletion, Addition, Repetition
3. A mutation of the genotype may or may not have an effect on the phenotype
4. The phenotype can be changed by the environment (bodybuilder, brain)

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