

## DNA to Protein Review

### What are the characteristics of DNA?

- Double stranded- helix
- A-T; G-C
- Sugars and phosphates on the outside
- Deoxyribose

### What are the characteristics of RNA?

- Single strand
- A-U; G-C ( uracil replaced thymine)
- Ribose sugar

### How are DNA and RNA the same?

- Both are nucleic acids
- Both have a sugar/phosphate backbone
- Both have Adenine, Guanine and Cytosine

### What is DNA replication?

- Makes a copy of DNA
- DNA makes more DNA

### Why do cells copy their DNA in DNA replication?

- To make more DNA just before cell division
- For growth, maintenance and repair

What does transcription do?

- Converts DNA into mRNA

What does translation do?

- Reads mRNA to make a protein

Where does DNA replication occur?

- In the nucleus

Where does transcription occur?

- In the nucleus

Where does translation occur?

- In the cytoplasm (at the ribosome)

What are the three types of RNA?

- mRNA
- rRNA
- tRNA

### What does mRNA do?

- Carries the DNA message to the ribosome

### What does rRNA do?

- Reads mRNA to assemble an amino acid chain (protein)

### What does tRNA do?

- Brings amino acids to rRNA (ribosome) to build a protein

### What are the steps of replication?

- Unwind the DNA
- Unzip the DNA
- Pair complimentary DNA bases on both sides of the original DNA strand.
- Rezip the DNA
- Rewind the DNA
- Resulting in two identical copies of DNA

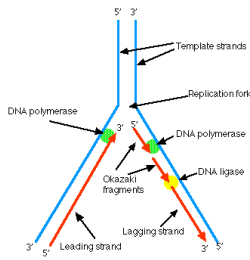
### What are the steps of transcription?

- Unwind the DNA
- Unzip the DNA (Gene)
- Pair complimentary RNA bases to one side of the DNA template
- Break mRNA away
- Rezip DNA
- Rewind DNA
- mRNA leaves the nucleus

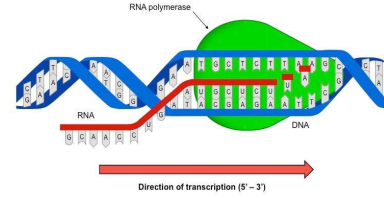
### What are the steps in translation

- mRNA is picked up by ribosome
- Ribosome reads the first codon and calls for a matching tRNA (anticodon)
- Codon is paired with anticodon and amino acid is dropped off
- Ribosome slides over to next codon
- Process repeats

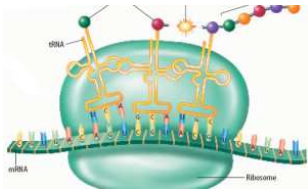
What process is this....



What process is this....



What process is this....



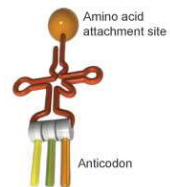
What is the DNA complement for AATTGGCC

- TTAACCGG

What is the RNA complement for AATTGGCC

- UUAACCGG

What is this....



How do read this table?

First Letter	Second Letter				Third Letter
	U	C	A	G	
U	phenylalanine	serine	tyrosine	cysteine	U
	phenylalanine	serine	tyrosine	cysteine	C
	leucine	serine	stop	stop	A
	leucine	serine	stop	tryptophan	G
C	leucine	proline	histidine	arginine	U
	leucine	proline	histidine	arginine	C
	leucine	proline	glutamine	arginine	A
	leucine	proline	glutamine	arginine	G
A	isoleucine	threonine	asparagine	serine	U
	isoleucine	threonine	asparagine	serine	C
	isoleucine	threonine	lysine	arginine	A
	isoleucine	threonine	lysine	arginine	G
G	valine	alanine	aspartate	glycine	U
	valine	alanine	aspartate	glycine	C
	valine	alanine	glutamate	glycine	A
	valine	alanine	glutamate	glycine	G

What is a protein made of?

- Amino acids

Three bases that code for one amino acid is called a?

- codon

Three bases that match a codon are called?

- anticodon

What is a stop codon?

- A nonsense codon that ends an amino acid sequence (protein)

What is a mutation?

- Any change in the DNA that could result in a change in your protein.