

Sec.: _____ Name: _____

Experiment: Protein Synthesis Controlled by DNA (B. Science 10-12-3h)

Purpose: To follow a portion of a single strand of DNA in a chromosome through the process of transcription till the formation of a protein molecule.

Materials: brain pencil

Methods:

1. In results number one is a single strand of a double helix segment of DNA, draw in the missing ribose molecules and phosphates above the bases, (show bonds).
2. This strand forms a m RNA by transcription draw in the appropriate m RNA nucleotides directly below the DNA bases.
3. What does this strand now enter?

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4. What now attaches to this stand of m RNA and initiates the process of attaching amino acids together?
5. What is the name of the codon that starts the sequence of m RNA?
6. The ribosome now is involved in attaching t RNA to the m RNA. Use a "t" shaped object to represent the t RNA, and attach this to the triplets. Also list the anti - codons of these t RNA's.
7. Remember that each triplet on the messenger RNA (not the t RNA) represents a certain amino acid that will be joined. On the top of each t RNA write the name of amino acid that is associated with it.
8. When the strand of m RNA is completely read by the ribosome, the ribosomes detaches. Draw a diagram of the end products.
9. What general names is this amino acid chain called in question 8?
10. Can the m RNA be read again to produce more amino acid sequences?

Results:



- 2.
3. Enters: _____
4. Attaches: _____
5. Codon: _____



6,7. UGC AUG CGU C G G A U G C G C U C G m RNA

8. Products
9. General name: _____
10. More? _____

Conclusions:

1. What is the role of the m RNA in the synthesis of proteins?
2. What is the role of the ribosomes in the synthesis of proteins?
3. What is the role of t RNA in the synthesis of proteins?
4. What is the role of ATP in the synthesis of proteins?

Discussion:

1. Below is a m RNA base sequence. Draw in the t RNA and the amino acid associated with each m RNA codon triplet.



2. This same strand of m RNA was exposed to some X rays which caused a mutation and the first U in the sequence was changed to a C as a result. Draw in the t RNA and the amino acid associated with each m RNA codon triplet.



3. How did the amino acid chain differ as a result?
4. Does this mean the proteins that the m RNA was supposed to code for no longer codes for this unique protein?
5. Prior to the flood (Gen. 5) humans lived for hundreds of years. What did God probably do to the genetic code so humans from the flood on only lived a maximum of about a hundred years?
6. Use the information in the chart on page 303 of your text to complete the following table. The first row has been completed to help you get started. (Remember the chart on page 303 is based on m RNA codons).

DNA codon	m RNA codon	t RNA anticodon	amino acid
AAA	UUU	AAA	phenylalanine
GTC			
	UGA		"STOP"
			methionine or "initiator"
GAT			
	GUG		valine