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## Unit 4: Lab 11 Protein Synthesis

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### Introduction:

DNA contains the code for all the protein an organism can produce. DNA is a very large molecule found in the nucleus of the cell. In order for the protein to be constructed on the ribosome, the DNA must allow the code to be copied and sent out to the ribosome. A special chemical called m-RNA is produced that takes the code to the ribosome. This process is called transcription. Once the code is on the ribosome, t-RNA molecules will take the proper amino acids to the m-RNA and produce the protein.

### Objectives:

- Students will be able to follow the process of transcription by cutting out the label parts and pasting them, in the proper order, on a skeleton of a cell.
- Students will be able to determine the amino acid sequence from a DNA code.

### Materials:

- Scissors
- Transparent tape or glue
- Template of the cell
- Labels for each step of protein synthesis
- Class notes or textbook

### Procedures:

1. Using a pair of scissors, cut out all of the labels dealing with protein synthesis.
  2. Locate the cell template on the lab paper. Notice that it contains a nucleus and another smaller structure.
  3. Label the nucleus.
  4. What is the name of this other cellular organelle? \_\_\_\_\_.
  5. With either glue or tape, attach the label to this cellular organelle. What is its major function in the cell?
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6. Look at the DNA code and paste it to the upper middle of the nucleus. Leave enough room for the m-RNA codons to be pasted below the DNA. Write out the m-RNA code here: \_\_\_\_\_

7. Paste the m-RNA on the bottom of the ribosome. When this is complete what process will begin to occur? \_\_\_\_\_.

8. Locate the t-RNA molecules. Notice that each one contains an amino acid or some other structure under it. How many t-RNA molecules are going to be needed to make the protein in the above code? \_\_\_\_\_.

9. Define a codon?  
\_\_\_\_\_  
\_\_\_\_\_

10. Glue or tape the appropriate t-RNA to its complementary codon on the ribosome.

11. List the amino acids, in order, in the following space  
\_\_\_\_\_  
\_\_\_\_\_

12. What is the start codon necessary?  
\_\_\_\_\_

13. How does the process know when to stop?  
\_\_\_\_\_  
\_\_\_\_\_

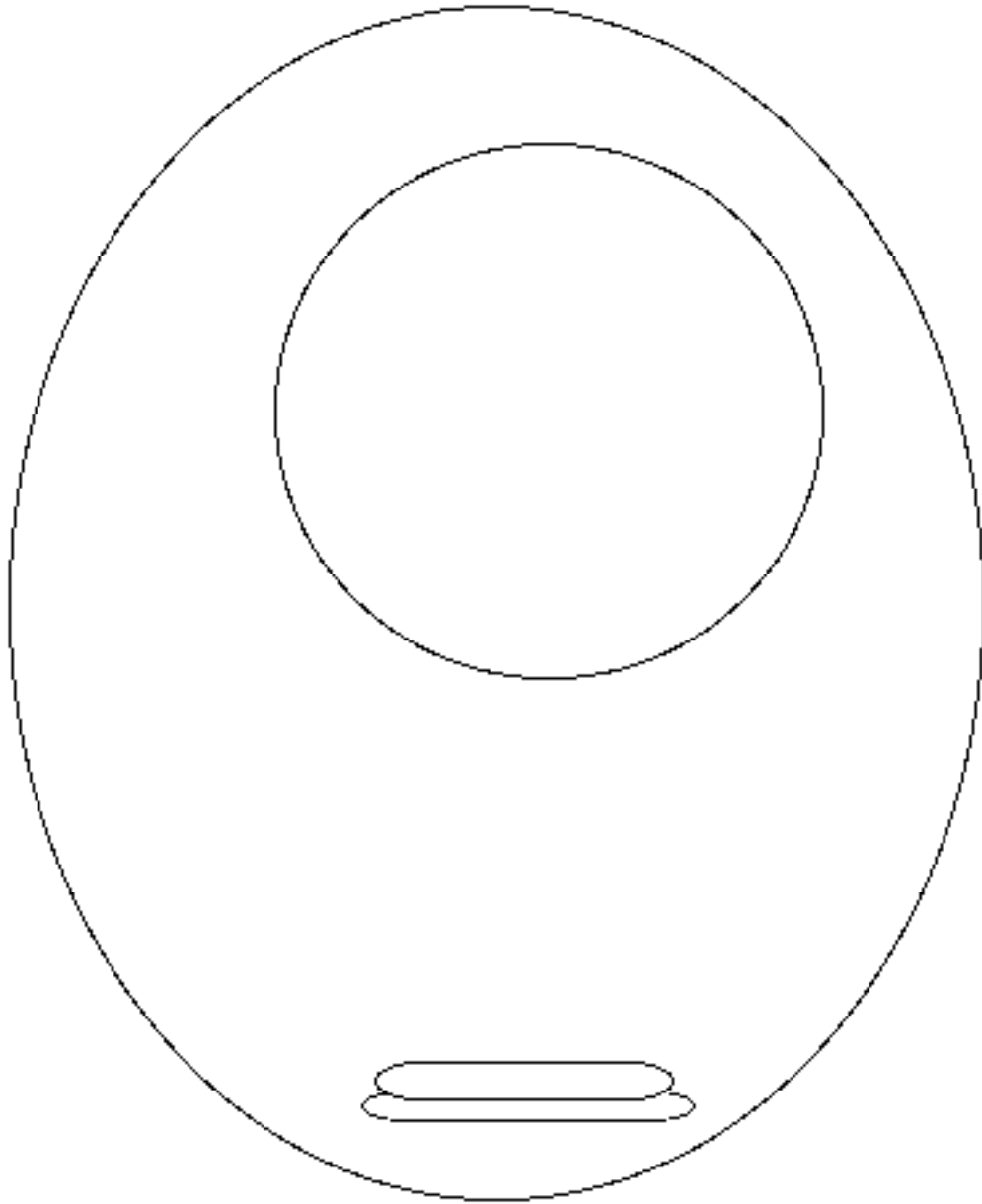
14. What part of the cell does transcription take place?  
\_\_\_\_\_.

15. Where does translation take place in the cell?  
\_\_\_\_\_.

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Cell Template





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Labels:

**DNA**

**TAC ACG TTA AGC ACT**

M-RNA Codons:

**UGA AAU AUG UCG UGC**

**UGA AAU AUG UCG UGC**

t-RNA and Amino Acids:

<b>AGC</b>	<b>ACG</b>	<b>UAC</b>	<b>ACU</b>	<b>UUA</b>
<b>SERINE</b>	<b>CYSTEINE</b>	<b>METH</b>	<b>STOP</b>	<b>ASPARAGINE</b>

**Ribosome**

**Nucleus**