

# Protein Synthesis Simulation

## Pre-Simulation Questions:

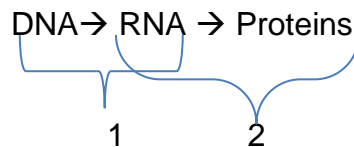
1. RNA is a different nucleic acid and differs from DNA on 3 things:

- RNA contains \_\_\_\_\_ (base) instead of \_\_\_\_\_ which is in DNA
- RNA has \_\_\_\_\_ strand, DNA has \_\_\_\_\_ stands.
- RNA stands for \_\_\_\_\_, DNA stands for \_\_\_\_\_, thus RNA has a sugar that contains \_\_\_\_\_ but the sugar in DNA does not contain \_\_\_\_\_.

2. If this is a DNA sequence, what would be the mRNA sequence:

T A T C C C G G A G A G G T C C A A T G C

3. In the following sequence:

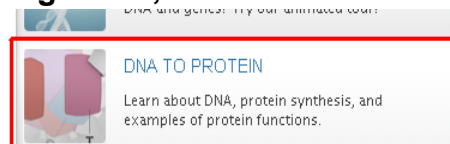


- What is the process called that occurs at 1? Where does it take place?
- What is the process called that occurs at 2? Where does it take place?

**Simulation: If you have headphones, you may listen along. If not, turn off the volume and read.**

Log on to <http://learn.genetics.utah.edu/>

Click the DNA to protein link and explore this module to find the answers to the questions below.



A. First Click On the tab that says “DNA to Protein” and Click on the “tour the basics.” Follow the module to answer the questions:



- What do the instructions for the cell look like?
- What are the base pairing rules?
- These “\_\_\_\_\_” are called \_\_\_\_\_. Genes make other molecules called \_\_\_\_\_. Proteins enable a cell to \_\_\_\_\_, such as working with other groups of cells to make hearing possible. →

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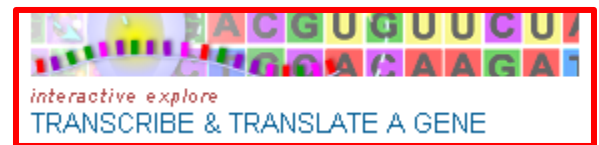
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B. Close the Screen and click “what is a gene” Complete the following questions based on the information in the module.

*tour of the basics*  
**WHAT IS A GENE ?**  
Learn about the units of heredity.

1. What is a gene?
2. What protein helps our blood carry oxygen?
3. How many genes do we have?
4. What will happen if our hemoglobin protein is mutated?

C. Close the screen and click “transcribe & translate” to launch the interactive module and complete the following questions.



1. The two-step process by which cells read a gene and produce a string of amino acids that will eventually become a protein is called:

\_\_\_\_\_ and \_\_\_\_\_

2. What is the base order of your DNA Strand in the module?
3. What is the base order of your complementary RNA strand?
4. How is mRNA different from DNA? (Hint read the side-bar on this page for help)
5. How many nucleotides are in a codon?
5. What is the correct starting position for translation?
6. Write the amino acids used to assemble your protein in order below.
8. In your own words explain how you used the amino acid chart.

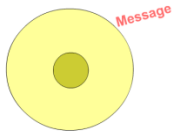

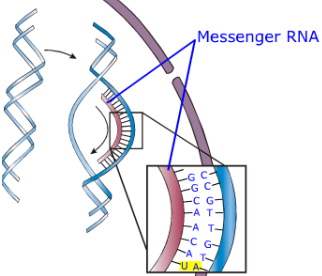
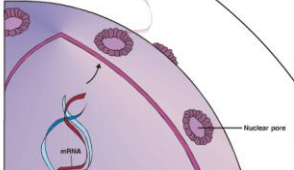
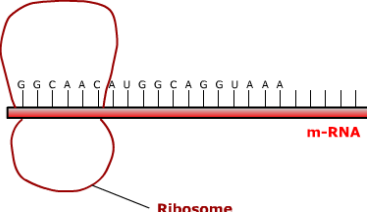
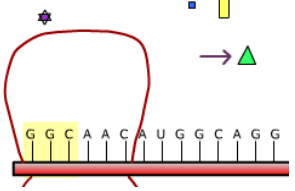


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D. Go to the following website: <http://www.wisc-online.com/objects/ViewObject.aspx?ID=AP1302>

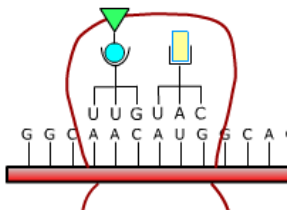
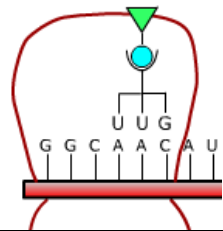
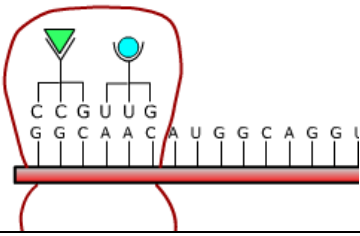
Click through the simulation and either draw a diagram or write a description of the one given below.

Picture	Description
	
	
	
	
	
	
	<p>A transfer RNA molecule has two ends. One end has a specific binding site for a particular amino acid. The other end has a particular sequence of three nucleotides, the anticodon that can base pair with a codon.</p>
	<p>The appropriate molecule of t-RNA attaches to and carries the activated amino acid to the ribosome. Anticodon base pair with a codon in order to bring the specific amino acid to the correct place</p>

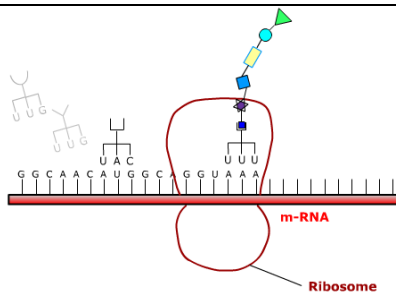


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The second t-RNA releases its "load" of amino acids to the third t-RNA and leaves the site. Amino acids link up, forming peptide bonds using ATP.



The polypeptide chain folds into its final conformation and is completed and released.

