

# Protein Synthesis

## Directions:

Insert and install your Interactions: Foundations CD.

- Click the "Contents" button.
- Open the *Cellular Level of Organization* file.
- Click on *Animations*.
- Work through *Protein Synthesis*.



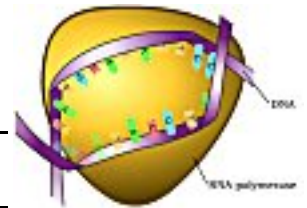
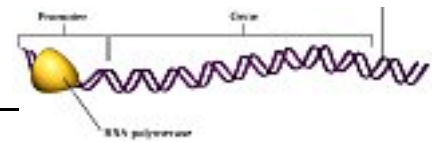
## Introduction

- Describe the cellular importance of protein synthesis. \_\_\_\_\_  
\_\_\_\_\_
- Where does the protein synthesis process begin? \_\_\_\_\_
  - What is *chromatin*? \_\_\_\_\_
  - Define a gene and explain its importance. \_\_\_\_\_  
\_\_\_\_\_



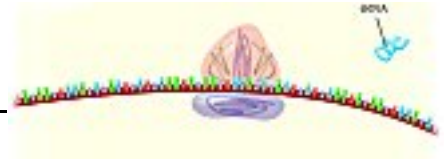
## Transcription

- Define *transcription*. \_\_\_\_\_  
\_\_\_\_\_
  - Explain the function of *RNA polymerase*. \_\_\_\_\_  
\_\_\_\_\_
- Describe the transcription process that results in synthesis of an RNA molecule. \_\_\_\_\_  
\_\_\_\_\_
- Contrast the functions of the three types of RNA molecules.  
*Messenger RNA (mRNA)* - \_\_\_\_\_  
*Transfer RNA (tRNA)* - \_\_\_\_\_  
*Ribosomal RNA (rRNA)* - \_\_\_\_\_
  - Where does transcription take place? \_\_\_\_\_



## Translation

6. Where does *translation* take place? \_\_\_\_\_

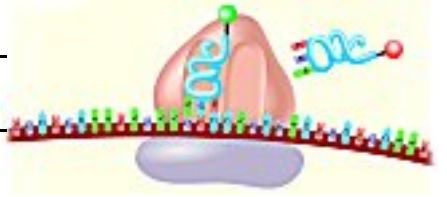


7. Ribosomal location determines the usage of proteins made there. How are proteins used produced at each of the following ribosomal location?

*Free ribosomes in the cytosol* - \_\_\_\_\_

*Rough Endoplasmic Reticulum (RER)* - \_\_\_\_\_

8. Describe tRNA function. \_\_\_\_\_



9. a. Define a *codon* and its function in protein synthesis. \_\_\_\_\_



10. Explain the translation process that results in production of a polypeptide.



## Processing of Proteins

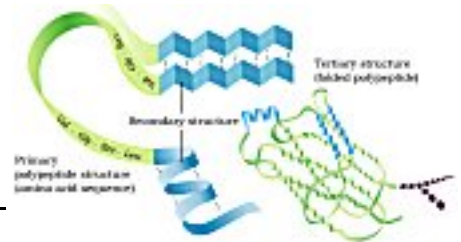
11. Describe polypeptide modification both at the ribosome and in the Golgi complex.

*Primary structure* - \_\_\_\_\_

*Secondary structure* - \_\_\_\_\_

*Tertiary structure* - \_\_\_\_\_

*Modified protein* - \_\_\_\_\_



12. a. Describe the role of *vesicles* produced by the Golgi. \_\_\_\_\_

b. How are each of the following "packaged" proteins handled differently.

*Cellular enzymes* - \_\_\_\_\_

*Membrane proteins* - \_\_\_\_\_

*Secretory proteins* - \_\_\_\_\_

## Review of Protein Functions

13. Summarize the following important functions of cellular proteins.

*Connecting* - \_\_\_\_\_

*Membrane transport* - \_\_\_\_\_

*Intercellular communication* - \_\_\_\_\_

*Body movement* - \_\_\_\_\_

*Regulation* - \_\_\_\_\_



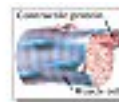
• Membrane proteins connecting cells together in tissues.



• Transport of chemicals via membrane proteins.



• Communication between cells via receptors.



• Movement of body and limbs via contraction of muscles.



• Regulation of the production of other chemicals by enzymatic action.