DNA to Protein Overview Assessment
Instructor Guide

Note to Instructor

This assessment determines the participant's basic knowledge of the DNA to Protein Translation. This assessment could be used as both a pre-test and post-test. This would provide information on what was learned as a result of completing the supporting PK and activities.

This is the assessment for the *DNA to Protein Overview Learning Module*.

- DNA to Protein Overview Primary Knowledge
- Activity: Protein Structure and Function
- Activity: Gene Transcription
- **DNA to Protein Overview Assessment**

Introduction

The purpose of this assessment is to determine your basic understanding of how the digitally encoded information for DNA is translated into a functional protein that can be used for diagnostics, analysis and measurements in medical applications. These medical applications is a growing field for MEMS, a field that has unlimited potential for MEMS and MEMS components.

There are 14 assessment questions.

1. Which of the following BEST describes "proteins"?
   a. Polymers composed of subunit known as amino acids
   b. The linear sequences of information found with a gene
   c. Polymer biological molecules that are subunits of amino acids
   d. A region of a DNA sequence to which RNA polymerase binds
2. Which of the following molecules provide our bodies with immune protection, cell structure and support, AND act as a transport for atoms and molecules within cells and the whole body?
   a. DNA
   b. Amino acids
   c. Proteins
   d. antibodies
3. What are amino acids composed of?
   a. Proteins, chromosomes, oxygen, and nitrogen
   b. Carbon, hydrogen, oxygen and phosphate
   c. Carbon, proteins, oxygen and nitrogen
   d. Carbon, hydrogen, oxygen and nitrogen

4. Which of the following BEST describe the Central Dogma of Biology? The process where DNA is ….
    a. elongated to mRNA which is translated to a polypeptide
    b. translated to RNA and RNA is transcribed to an amino acid
    c. transcribed to RNA and RNA is translated to a polypeptide
    d. transcribe to RNA and RNA is elongated to an amino acid
5. In RNA the nitrogenous base uracil replaces the _____ base in DNA.
    a. thymine
    b. adenine
    c. guanine
    d. cytosine
6. In the DNA to Protein process, the step that is defined as "DNA-directed RNA synthesis" is called…
    a. Transcription
    b. Translation
    c. Elongation
    d. Initiation
7. In the DNA to Protein process, the step where the mRNA is translated to protein or polypeptide is called…
    a. Transcription
    b. Translation
    c. Elongation
    d. Initiation
8. Which of the following BEST describes the role of mRNA during the DNA to Protein process?
    a. Transport specific amino acids for incorporation into a growing polypeptide chain
    b. Direct the tRNA where to start, which strand of DNA to read, and which direction to take
    c. Identify which part(s) of the DNA to duplicate – where to start, where to stop
    d. Provide a template for the creation of a protein once it enters the cytoplasm
9. Which of the following BEST describes the role of tRNA during the DNA to Protein process?
    a. Transport specific amino acids for incorporation into a growing polypeptide chain
    b. Direct the tRNA where to start, which strand of DNA to read, and which direction to take
    c. Identify which part(s) of the DNA to duplicate – where to start, where to stop
    d. Provide a template for the creation of a protein once it enters the cytoplasm
10. The triplet code contained within mRNA is a series of three adjacent bases in one polynucleotide chain. This code is called a ….
    a. tRNAmet
    b. met
    c. codon
    d. phe

11. Which of the following BEST explains why the genetic code is "almost" universal by all known organisms (i.e., human, animals, plants, fungi archaea, bacteria and viruses.)? Small variations in the code to not exist in…
    a. **mitochondria and certain microbes**.
    b. mitochondria and ribosome.
    c. cytoplasm and centrosome.
    d. nucleus and cytoskeleton.
12. What components make up a ribosome?
    a. Amino acids and tRNA
    b. mRNA and cytoplasm
    c. Ribosomal RNA and amino acids
    d. Ribosomal RNA and proteins
13. What ultimately determines the shape of a folded protein?
    a. Content of mRNA
    b. Sequence of amino acids
    c. A proteome subset
    d. The stop codon
14. A micro-sized device that uses an enzyme linked to an antibody to detect specific proteins is called…
    a. GeneChip
    b. RNA chip
    c. ELISA
    d. Nucleic acid array

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