

**Southwest Center for Microsystems Education (SCME)
University of New Mexico**

DNA to Protein Overview Learning Module

This learning module contains five (5) units:

Knowledge Probe (KP or pre-test)
Primary Knowledge (PK – reading material)
Protein Structure and Function Activity
Gene Transcription Activity
Final Assessment

A Learning Module Map is included as a suggested outline.

This learning module provides information needed to understand how the digitally encoded information in DNA is translated into a functional protein that can be used for biomedical applications. Activities delve deeper into protein structure and function as well as gene transcription.

Target audiences: High School, Community College, University

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Website: www.scme-nm.org

Learning Module Map for DNA to Protein Overview

This learning module provides information needed to understand how the digitally encoded information in DNA is translated into a functional protein that can be used for biomedical applications. Activities delve deeper into protein structure and function as well as gene transcription.

Learning Module units (5):

- Knowledge Probe (pre-assessment)
- DNA to Protein Overview PK – Reading material
- Protein Structure and Function Activity
- Gene Transcription Activity
- Assessment

Following is a suggested map on the implementation of this learning module. This map is strictly a suggestion. You may use any SCO in this learning module as a stand-alone unit or activity OR in any sequence that best fits your classroom.

IMPORTANT STEPS	KEY POINTS	REASONS
Knowledge Probe (KP)	This is a pre-assessment that the participants should take prior to starting this learning module.	This KP will determine the participants' current knowledge of DNA to Protein concepts, process and terminology. This KP could be compared with the Final Assessment to determine a level of learning.
Assign the primary knowledge (PK) unit as a reading assignment. Review the <i>DNA to Protein Overview PK</i> and address any questions.	A PowerPoint presentation is provided that is a summary of the PK and be presented to all participants in the classroom.	This introduction will help participants better understand the activities.
Complete the activity "Protein Structure and Function"	Participants further explore the biological functions of proteins, protein structure and bioMEMS applications of proteins.	This online tutorial allows the participants to explore at their own pace several concepts related to proteins.

Complete the activity “Gene Transcription”	In this activity the participants explore the genetic code, codons, and the significance of codons in DNA to Protein transcription.	This activity allows the students to better understand proteins, codons and DNA sequences.
DNA to Protein Overview Assessment	Give the participants the <u>DNA to Protein Overview</u> assessment.	Participants are evaluated on what they have learned about Transcription, translation, and proteins and how it relates to genetics.

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This Learning Module was developed in conjunction with Bio-Link, a National Science Foundation Advanced Technological Education (ATE) Center for Biotechnology @ www.bio-link.org.