BIOLOGICAL FRAMEWORKS FOR ENGINEERS

Session #7 [nm: Genes, Decoding, and Mutations]

General Objectives:
- ✓ Introduction to genetic sequencing techniques
- ✓ Identify and discuss the basis for mutations

Central Framework:
- ✓ Decoding genetic information is technology driven and advances in understanding of sequences and mutations often come after the discover of a new approach of technique

Interactive Activity:
- ✓ Worksheet on mutation

Session Outline:

I.   Genes

II.   Decoding

       A. Restriction endonuclease

       B. Sanger Method

       C. Electrophoresis

D. Automatic Sequencing

E. Splicing

F. PCR

II. Genetic Mutation

A. Point mutations

B. Rearrangement mutations

MUTATION EXERCISE

Fill out the amino acid sequence starting coding strand.

DNA   (5') G G A T A G C A T G A A A C C C G C A T A A (3')

amino acid

How would the amino acid sequence above change with the following changes (mutations) in the DNA code (changes are marked in **bold-face**):

a.   (5') G G A T A G C A T G A A A C C **A** G C A T A A (3') change

amino acid

b.   (5') G G A T A G C A T G A A A C C C **C** C A T A A (3') change

amino acid

c.   (5') G G A T A G C A T G A A A **-** C C G C A T A A (3') delete

amino acid

d.   (5') G G A T A G C A T G **T** A A C C C G C A T A A (3') change

amino acid

e.   (5') G G A T A G C A T G A A A **T A A** C C A G C A (3') shuffle

amino acid