Name\_\_\_\_\_ Date\_\_\_\_\_Per\_\_\_

# **ACTIVITY: Mutation Simulation**

## **PART 1:**

The following is the base sequence on one strand of DNA molecule: **AATGCCAGTGGTTCGCAC** 

### **QUESTION 1:**

a) Write the base sequence of the strand mRNA transcribed from the original DNA strand.

b) What **protein fragment** (amino acid sequence) would this mRNA code for? (USE your codon chart, or Table 11.2 on page 298 of your textbook)

### **QUESTION 2:**

a) If the fourth nucleotide in the original DNA strand were changed from G to C, write the NEW DNA strand sequence.

b) What would the resulting mRNA sequence be based on this NEW DNA sequence?

c) What would the resulting protein fragment (amino acid sequence) be?



### **QUESTION 3:**

a) If a G were ADDED to **the original DNA strand** after the third nucleotide, write the **NEW** DNA strand sequence. (NOTE: do NOT keep the mutation from question #2)

b) What would the resulting mRNA sequence be based on this NEW DNA sequence?

c) What would the resulting protein fragment (amino acid sequence) be?

### **QUESTION 4:**

a) If the eighth nucleotide in the original DNA strand were changed form G to C, write the NEW DNA strand sequence. (NOTE: do NOT keep the mutation from questions 2 or 3)

b) What would the resulting mRNA sequence based on this NEW DNA sequence?

c) What would the resulting protein fragment (amino acid sequence) be?

# **PART 2:**

The following is the base sequence on one strand of DNA: CACGTGGACTGAGGACTCCTC

## **QUESTION 1:**

a) What mRNA sequence would be transcribed from the original DNA strand?

b) What protein fragment (amino acid sequence) would this mRNA code for?

### **QUESTION 2:**

a) If the 17<sup>th</sup> nucleotide in the original DNA strand were changed from T to A, write the NEW DNA strand sequence.

b) What mRNA sequence would the NEW DNA sequence code for?

c) What protein fragment (amino acid sequence) would this mRNA code for?

QUESTION 3: How are the proteins produced in #1b and #2c different?\_\_\_\_\_

## **PART 3:**

The following is the base sequence on one strand of DNA: TAGTAGAAACCAACAAGGATA

### **QUESTION 1:**

a) What mRNA sequence would the original DNA strand code for?\_\_\_\_\_

b) What protein fragment (amino acid sequence) would this mRNA code for?\_\_\_\_\_

### **QUESTION 2:**

a) If the 7<sup>th</sup>, 8<sup>th</sup>, and 9<sup>th</sup> nucleotides (AAA) in the original DNA strand were deleted, write the NEW DNA strand sequence.

b) What mRNA molecule would the NEW DNA code for?\_\_\_\_\_

c) What protein fragment would this mRNA code for?\_\_\_\_\_

**QUESTION 3**: Compare the proteins in questions #1b and #2c. (How are they similar? How are they different?)