

DNA, RNA & PROTEIN

This is a pencil and paper lab. You are given a “Made-up” strand of DNA that you will transcribe into RNA using the standard base pairing rules. You can then translate this RNA into protein using the genetic code. Then you will be asked questions to find the effects of a point mutation (one base changed), a frameshift mutation (one base added) and a point mutation which results in a nonsense mutation which ends the protein early.

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

A A T G C C A G T G G T T C G C A C

1. Give the base sequence of the complementary DNA strand.
2. Draw the DNA molecule using the symbols A,C,D,G,P, and T.
3. Draw the base sequence of the strand of mRNA read from the original DNA strand.
4. Draw the RNA molecule.
5. What protein fragment would this mRNA code for? (textbook page 230)

6. If the fourth nucleotide in the original DNA strand were changed from G to C, what would the resulting mRNA base sequence look like?

7. What would the resulting protein fragment look like ?

8. If a G were added to the original DNA strand after the third nucleotide, what would the resulting mRNA base sequence look like ?

9. What would the resulting protein look like ?

10. If the eighth nucleotide in the original DNA strand were changed from G to C, what would the resulting mRNA base sequence look like ?

11. What would the resulting protein look like ?