

Practice Problems:

Use the following piece of DNA to answer the following questions:

Coding: 5' T C G A A T G C C C T C A G A G T C A T A A C C C A C A C C 3'

Template:

mRNA:

1. This is the **coding** strand of DNA. What is the Template strand of DNA? What is the mRNA? The protein coded by the mRNA?

2. If the base marked T is changes to a C, what will be the resulting change in the protein?

3. What is the amino acid associated with tRNA's with the following anticodons?

3' CCC 5'

3' UCA 5'

5' CGU 3'

5' UCA 3'

4. Make a drawing illustrating the basic principles of DNA replication. Be sure to include the following: helicase, topoisomerase, DNA polymerase, leading strand, lagging strand, Okazaki fragment, ligase.

5. What is the difference between a leading strand and a lagging strand? A lagging strand and an Okazaki fragment.

6. Draw a $2n=4$ cell in Metaphase of Mitosis. Metaphase I of Meiosis. Metaphase II of Meiosis. How are they different?

7. What would happen if the repressor protein in the *trp* operon was mutated so that it no longer had an affinity for tryptophan? If the operator region of DNA was removed?

8. What are the four basic levels of control in eukaryotic gene expression? Give examples of each. Which is the most common method of regulating eukaryotic genes?

