Bio 93 Discussion Section Week 7 Worksheet

1a. True or False (circle one): The mRNA strand will be identical to the non-template strand except that the thymines have been replaced with uracils.

1b. What is another name for the “non-template strand” that Dr. Edinger has used in lecture?
   
   [Circle: sense strand]

2. The strands of a DNA double helix are directional, meaning they have a 5’ and 3’ end. The 5’ end is where a ______________ group is attached to the 5’ carbon of a deoxyribose sugar, whereas the 3’ end is where a ______________ group is attached to the 3’ carbon of a deoxyribose sugar.
   
   [Phosphate] [Hydroxyl]

3. Transcription initiation requires 3 objects:
   
   - TATA box (part of promoter)
   - transcription factors
   - RNA polymerase II

4. To go from the primary RNA transcript to mRNA, 3 additions and/or deletions are made to the primary RNA transcript. What are they?
   
   + 5’ cap
   + 3’ Poly-A tail
   - introns (spliced out)

5. The role of tRNA in translation requires two steps. What are they?
   
   i. Correctly matching the amino acid to the corresponding tRNA
   ii. Correctly matching the anticodon of the tRNA to the codon on the mRNA sequence

6. What is the enzyme that is used in one of the steps of the previous question?
   
   [Circle: amino acyl - tRNA synthase]
7. How does the affect of the insertion/deletion of 3 nucleotide bases differ from the effect of inserting/deleting a single nucleotide?
- 1/D a single nucleotide base has a greater potential for damage because it could lead to a frameshift
- 1/D 3 nucleotide bases will result in a single amino acid

8a. Draw the following:

Acetylated histones

Unacetylated histones

8b. How does the acetylation of histones affect whether certain genes are transcribed or not?
- If acetylated, allows access to DNA by transcriptional machinery
- If unacetylated, will bunch up and not allow transcription


Dr. Edinger said you should be able to do this.

UTR: untranslated region

5'UTR AUG STOP 3'UTR AAAAA

5' cap Poly-A tail

10. Draw the RNA transcript that would result from the DNA strand below. Label the 3' and 5' ends.

3'-CGGTACGCTACCGATATCAGG-5'
5'-CGCATGCATGGGTATAGTCC-3'

5'-CGCAUGCAUGCAUGCAUGCAUG

Start Stop

10b. "BUILD" THE PROTEIN USING AMINO ACID CHART:

Met - His - Gly - Leu