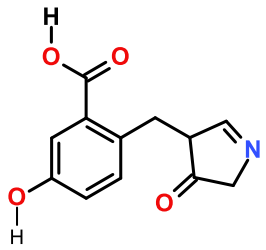
Problem Set 1:

You should be able to answer these questions based on the suggested reading from the openstax text (see syllabus). Feel free to use *any* resource outside of the text or the lecture!



1. Add the correct hydrogen atoms to the drawing on the right, briefly justify your answer.
2. What type of favorable interaction can occur between two water molecules? Hint: Think of the partial charges on each atom.
3. What is an enantiomer? Does an enantiomer exist for the compound on the right?
4. How much does the proton (hydrogen ion) concentration increase if the pH of a solution is changed from 6 to 5?
5. What would happen if ribosomes were inhibited in cells? What could the cell not do?
6. In the openstax text, what is incorrect about the way the peptide bond is drawn in figure 3.24?
7. What is the difference between a purine and a pyrimidine? What are the common features of a A-T and a G-C basepair?
8. Compare and contrast prokaryotic to eukaryotic cells. What major features do they have in common, how do they differ?
9. What organelles does a protein transit through if it is to be secreted by a eukaryotic cell?
10. What is the role of the lysosome in a eukaryotic cell?
11. What is the role of topoisomerases in DNA replication?
12. What is the most significant difference between prokaryotic and eukaryotic DNA replication?
13. What is a promoter and what part of the prokaryotic RNA polymerase binds to the promoter?
14. In an mRNA, how many bases code for one amino acid?
15. Compare and contrast exons and introns
16. What three key processing steps happen to mRNA molecules in eukaryotic cells, after the mRNAs are generated by RNA polymerase by transcription?