**CHEM523 Homework 5**

Send me your answers via Rocketbook by the due date.

1. What are the 5 ways we mentioned in class to regulate the activity of a protein? Give an example of each one.
2. What is the evolutionary advantage of allostery? Use a curve and specific points on the curve to support your answer.
3. Why aren’t Aspartic acid and Glutamic acid targets for protein phosphorylation?
4. What is divergent evolution? Give an example.
5. What is convergent evolution? Give an example.
6. Draw the mechanism for carbonic anhydrase. What would happen to the Vo if you mutated the histidine of the proton shuttle to an alanine?
7. Draw the mechanism for the phosphorylation of a serine residue by a protein kinase, knowing that the enzyme catalyzes the reaction by proximity (no covalent intermediate, the kinase just binds the two substrates and a reaction occurs). The substrate and products are below:

Substrates bound into the enzyme:

A picture containing diagram

Description automatically generated

Products after kinase catalyzed phosphorylation:

