Test-Prep
Exam 2
10/20/25

- Define Allostery

- Define binding site and active site

- What are the general traits of allosteric interactions?

- What are the concerted assumptions?

- Draw the concerted model

- What are the sequential model assumptions?

- Draw the sequential model

- What are the subunits and quantities of hemoglobin?

- Where does oxygen bind to hemoglobin?

- What is the importance of Histidine? Why is this amino acid special in regard to the binding of Hb?

- Draw the graph associated with hemoglobin. Label the location of arteries, veins, lungs, and tissues along the curve. Draw the additional curves representing the addition of _____ and ___ concentrations.

- Lungs $pO_2 =$
- Tissues $pO_2 =$

- What causes oxygen to dissociate from Hb? Where is this occurring?

- Why is oxygen concentration relatively low in tissues/muscle cells?

- Where does CO_2 bind to Hb? Write out the chemical equations for the binding of CO_2 relative to their location in the body.

- Where is Mb found?

- How many subunits make up Mb?

- The muscles of deep diving mammals such as whales contain exceptionally large amounts of Mb. How does this circumstance contribute to prolonged dives?

- All enzymes are? Name the exception.

- What is the function of an enzyme?

- Define activation energy

- Draw the Ea graph of HCl + NaOH → Benzene with and without the presence of an enzyme.

- What determines the specificity of the substrates?

- Draw the induced fit model. What is occurring here?

- What are the rules of a chemical reaction?

- How are enzymes regulated?

- Name the classes of enzymes

- What is the steady state assumption?

- Define velocity in an enzymatic sense

- Define initial velocity

- Draw the simplest enzymatic reaction

- From the reaction above, how would we derive the equation for velocity?

- Derive the equation for Vmax from the above reaction. What does Vmax represent?

- What is the Michaelis-Menten constant (Km)? What does it represent?

- Derive the Michaelis-Menten equation

- What are the advantages and disadvantages of the MM equation?
  - Advantages

  - Disadvantages

- What are the advantages and disadvantages of the LWB equation?
  - Advantages

  - Disadvantages

- Bigger Km = _____ affinity

- Define competitive inhibition and draw the reaction. Give both the written chemical equation and associated graph.

- Define noncompetetive inhibition and draw the reaction. Give both the written chemical equation and associated graph.

- Define uncompetetive inhibition and draw the reaction. Give both the written chemical equation and associated graph.

- Draw a LWB and MM graph illustrating competitive, noncompetetive, and uncompetitive inhibition.

- Assume you have a LWB plot and determine the x-intercept is approximately -8. What is the corresponding Km value?

- Define feedback inhibition and draw the reaction

- Differentiate between a random mechanism and an ordered mechanism.

- Draw and explain what is happening during a ping pong mechanism.