Enzyme Kinetics Quiz Answer Key PDF

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Which of the following best describes the active site of an enzyme?

A. The site where inhibitors bind
B. The site where products are released
C. The site where substrates bind ✓
D. The site where enzymes are synthesized

What type of inhibition is characterized by an increase in Km but no change in Vmax?

A. Non-competitive inhibition
B. Competitive inhibition ✓
C. Uncompetitive inhibition
D. Mixed inhibition

What is the primary role of an enzyme in a biochemical reaction?

A. To increase the activation energy
B. To decrease the activation energy ✓
C. To act as a reactant
D. To act as a product

What is the primary determinant of enzyme specificity?

A. Enzyme concentration
B. Substrate concentration
C. Shape and charge of the active site ✓
D. Temperature

In a Lineweaver-Burk plot, what do the intercepts represent? (Select all that apply)

A. The y-intercept represents 1/Vmax. ✓
B. The x-intercept represents -1/Km. ✓
C. The slope represents Km/Vmax. ✓
D. The x-intercept represents 1/Vmax.

Which factors can influence enzyme activity? (Select all that apply)

A. Temperature ✓
B. pH ✓
C. Substrate concentration ✓
D. Light intensity

What is the effect of a non-competitive inhibitor on an enzyme-catalyzed reaction?

A. Increases Vmax
B. Decreases Km
C. Decreases Vmax ✓
D. Increases Km

Which statements are true regarding enzyme inhibitors? (Select all that apply)

A. Competitive inhibitors bind to the active site. ✓
B. Non-competitive inhibitors change the enzyme's shape. ✓
C. Uncompetitive inhibitors bind only to the enzyme-substrate complex. ✓
D. Mixed inhibitors increase Vmax.

Which plot is used to determine Km and Vmax by linearizing the Michaelis-Menten equation?

A. Eadie-Hofstee plot
B. Michaelis-Menten plot
C. Lineweaver-Burk plot ✓
D. Hill plot

What are characteristics of allosteric regulation? (Select all that apply)

A. Involves binding at the active site
B. Can activate or inhibit enzyme activity ✓

C. Involves conformational changes in the enzyme ✓
D. Is irreversible

Which factor does NOT affect enzyme activity?

A. Temperature
B. pH
C. Substrate concentration
D. Atmospheric pressure ✓

Which of the following are applications of enzyme kinetics? (Select all that apply)

A. Drug development ✓
B. Industrial biotechnology ✓
C. Atmospheric studies
D. Food processing ✓

Which of the following are true about the Michaelis-Menten constant (Km)? (Select all that apply)

A. It is the substrate concentration at which the reaction velocity is half of Vmax. ✓
B. It indicates the affinity of the enzyme for its substrate. ✓
C. A lower Km value indicates a higher affinity for the substrate. ✓
D. It is affected by enzyme concentration.

In Michaelis-Menten kinetics, what does Vmax represent?

A. The substrate concentration at half-maximal velocity
B. The maximum rate of reaction ✓
C. The enzyme concentration
D. The inhibitor concentration