

Enzymes

Enzymes are proteins that reduce reaction times and activation energy, necessary for survival
(Reactants + catalyst = solution)

Enzymes bind to an active site on the substrate ('Lock and key')

Allosteric control

- >Bind to allosteric site and alters the shape of the active site for enzymes
- Allosteric activation = positive modulation
- Allosteric deactivation = negative modulation

Competitive inhibition (1 site)

- >Inhibitor and substrate compete for the same active site.
- >Inhibitor blocks active site

Noncompetitive inhibition (2 sites)

- >Binds to allosteric site, but no change in substrate affinity

Uncompetitive inhibition (1 site, allows for two binds)

- >Once the substrate binds and reaction, a site for the inhibitor binds

Mixed inhibition

- (Similar to noncompetitive)
- >Can affect affinity for substrate, but always decreases reaction rate

Suicide inhibition

- >Irreversible reaction, the inhibitor binds where the substrate would (competitive) and generates a reaction (doesn't complete)

Accumulation of product

- >When you accumulate a surplus of product, it will inhibit the enzyme
ie: Glucose-6 phosphate and hexokinase

Phosphorylation toggling active/inactive forms (mTOR)

- >Phosphate is added to a protein, which affects activity of that protein
 - >Glycogen synthase (PKA off)
 - >Glycogen phosphorylase (PKA on)
 - >PKA
 - >Epi initiates PKA