**Enzyme**

* Catalyst- substance that affects a chemical reaction without being consumed
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – protein or RNA molecule that acts as a biological catalyst

Active Site: location on the enzyme where \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ occurs

* Substrate – substance than an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ acts upon
* Product – substance that is created

**Role of Enzymes**

1. Increase biochemical reaction rates
2. Help regulate cell metabolism

**Characteristics of Enzymes**

* Names usually end in suffix –\_\_\_\_\_\_\_\_\_\_\_\_\_
* Bind to specific substrate(s)
* Able to facilitate the reaction of large quantities of substrate
* Enable cell reactions to proceed at biological temperatures
  + Lower the amount of activation energy required for reaction
* Work best at certain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_
* Can function inside or outside the cell

**Activation Energy**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- the minimum energy needed to cause a chemical reaction to occur**
* **Enzymes \_\_\_\_\_\_\_\_\_\_\_\_ amount of activation energy needed**

**Two binding theories**

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ model – substrate molecule fits closely into enzyme (just like a key in a lock)

• Induced fit model – enzyme’s shape changes slightly to bind with substrate, more widely accepted

**Process**

* Substrate molecule fits into active site on enzyme
  + - “Enzyme-substrate complex”
* Enzyme shape changes slightly to bind to substrate
  + - “Induced fit”
* Enzyme catalyzes a chemical reaction in the substrate
  + - Involves breaking or forming chemical bonds
* Products are released
* Enzyme is ready to bind to another substrate

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