

# 2.5 Enzymes

## KEY CONCEPT

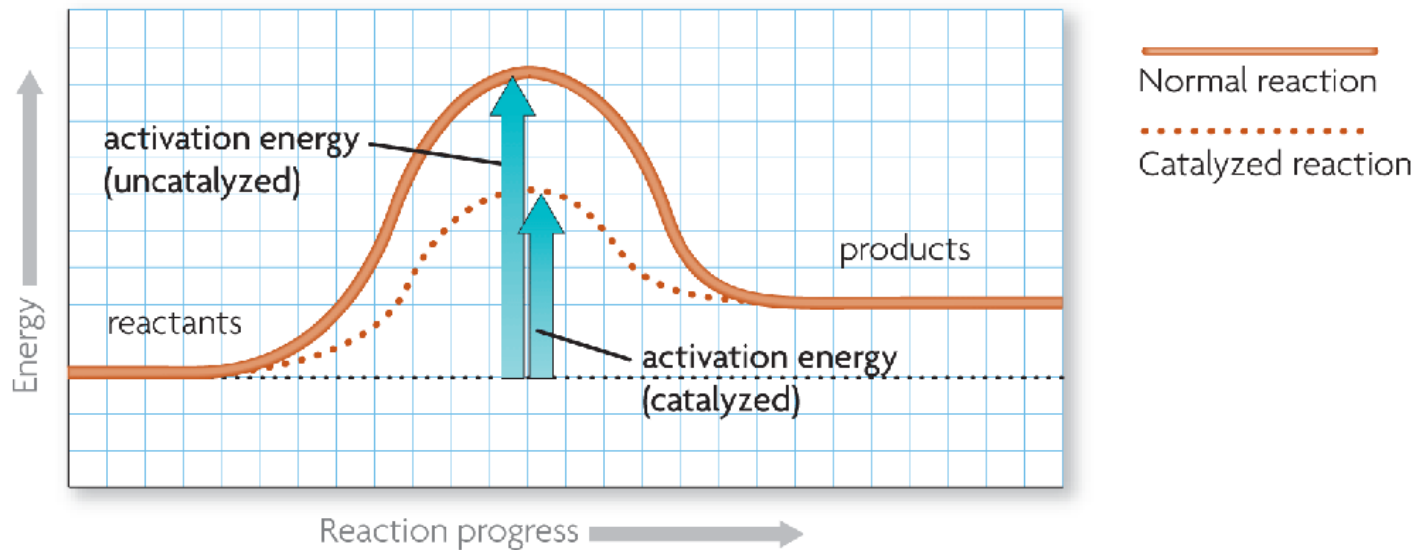
**Enzymes are catalysts for chemical reactions in living things.**



# 2.5 Enzymes

## ▶ A catalyst lowers activation energy.

- **Catalysts** - speeds up chemical reactions by:
  - decrease activation energy and increase reaction rate
  - is not used up during a reaction and does not alter the equilibrium of the reaction



## 2.5 Enzymes

- ▶ **Enzymes allow chemical reactions to occur under tightly controlled conditions.**
  - **Enzymes** are catalysts in living things.
    - Enzymes are needed for almost all processes.
    - Most enzymes are proteins.

## 2.5 Enzymes

- **Homeostasis and Enzymes:**

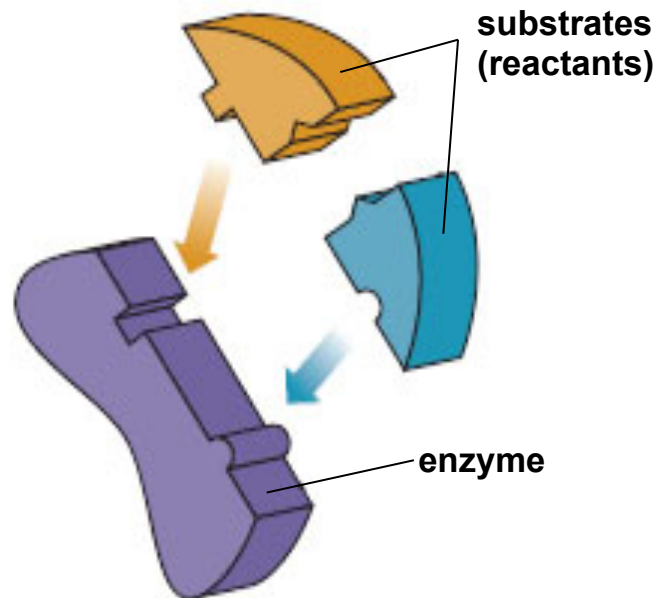
- Disruptions in homeostasis can prevent enzymes from functioning.
- Enzymes function best in a **small range** of conditions.
- Changes in **temperature** and **pH** can break hydrogen bonds.
- An enzyme's function depends on its **structure**.

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## Enzyme Structure and Function:

- An enzyme's **structure** allows only certain reactants to bind to the enzyme.
- Altered enzyme structure prevents the enzyme from functioning properly

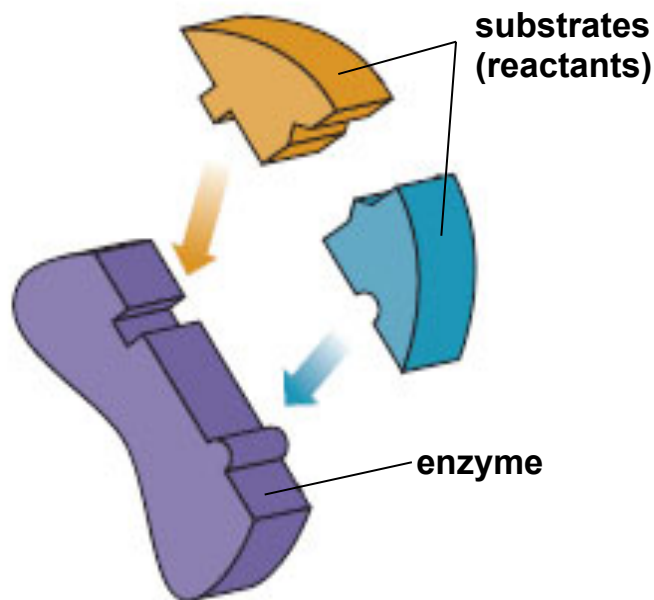
- substrates
- active site



Substrates bind to an enzyme at certain places called active sites.

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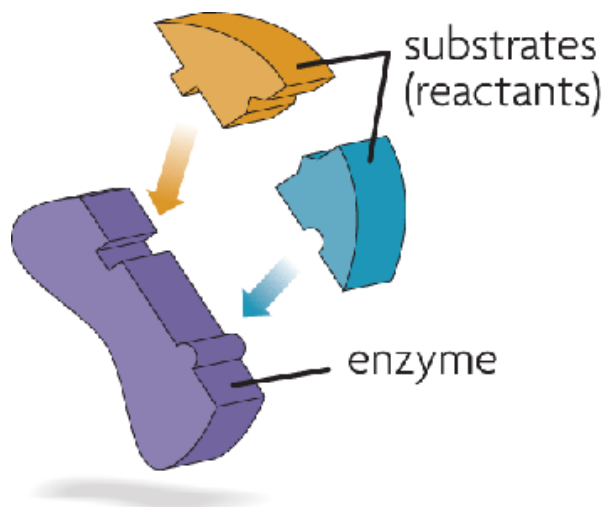
- The **lock-and-key model** helps illustrate how enzymes function.
  - **Substrates:**
    - are reactants acted upon by an enzyme
    - bind to an enzyme's active site



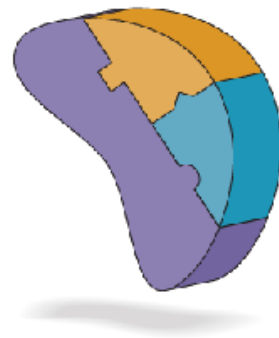
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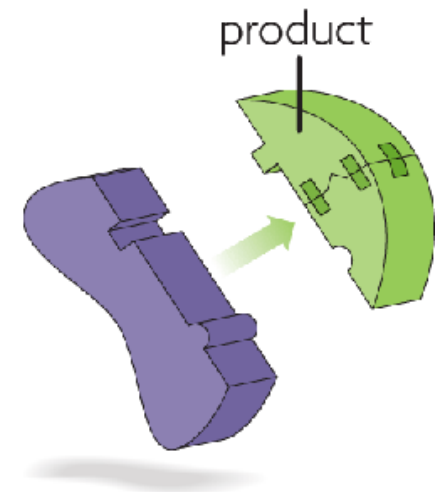
- The **lock-and-key model** helps illustrate how enzymes function.
  - Only particular substrates will bind to particular enzymes
  - When bound, bonds in substrates weakened allowing reaction to occur



Substrates bind to an enzyme at certain places called active sites.



The enzyme brings substrates together and weakens their bonds.



The catalyzed reaction forms a product that is released from the enzyme.