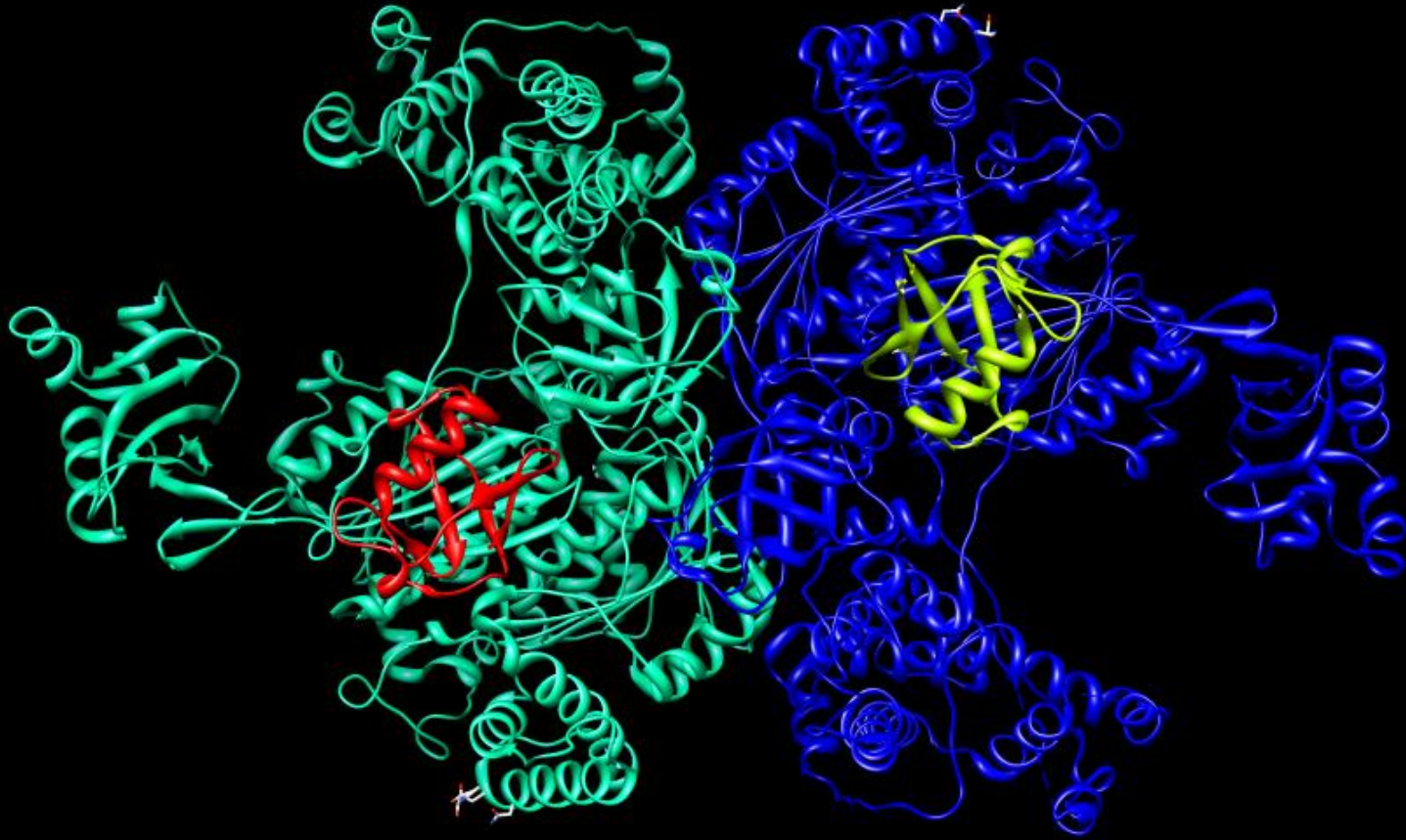


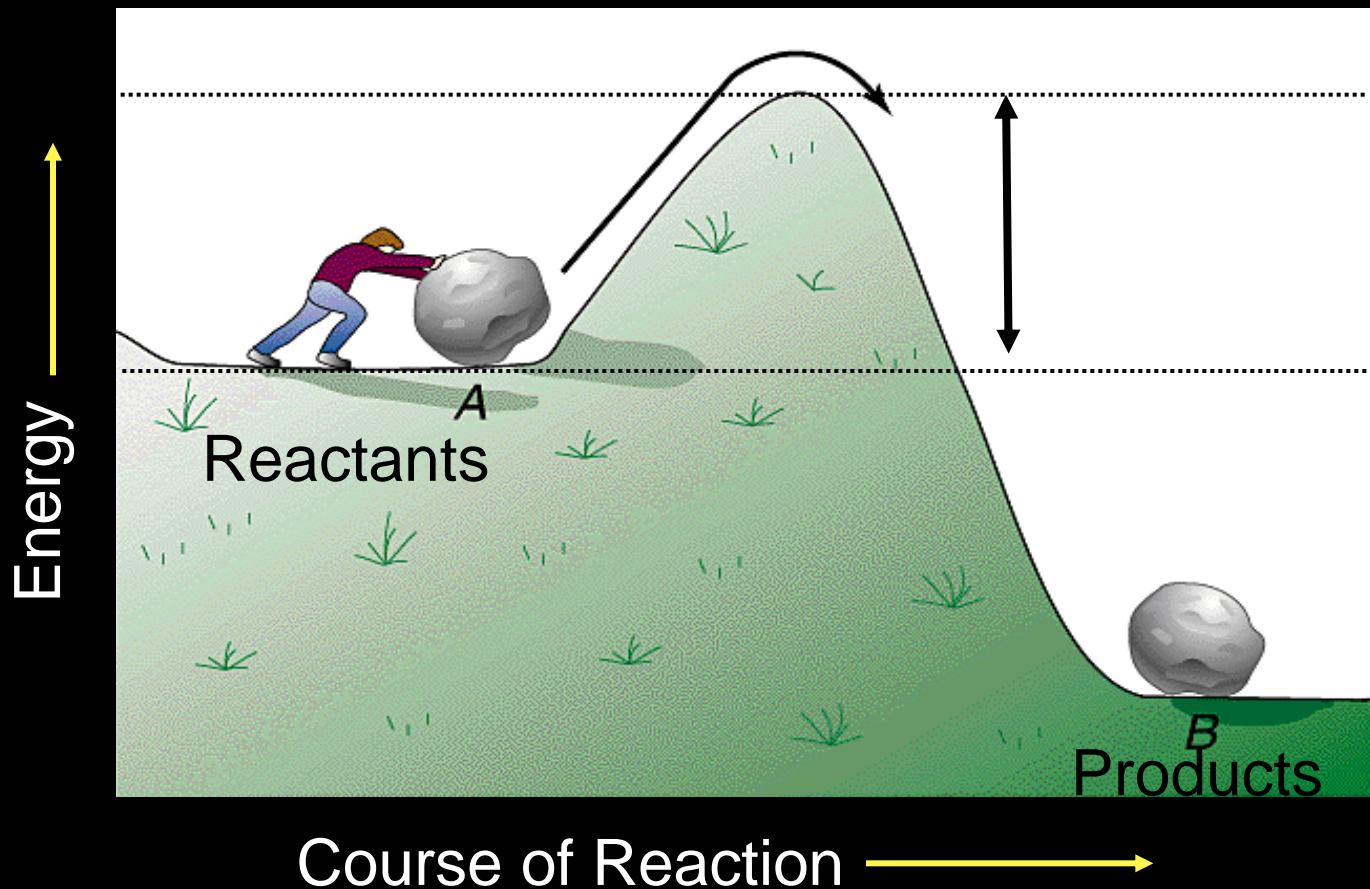
Enzymes



Learning Objectives

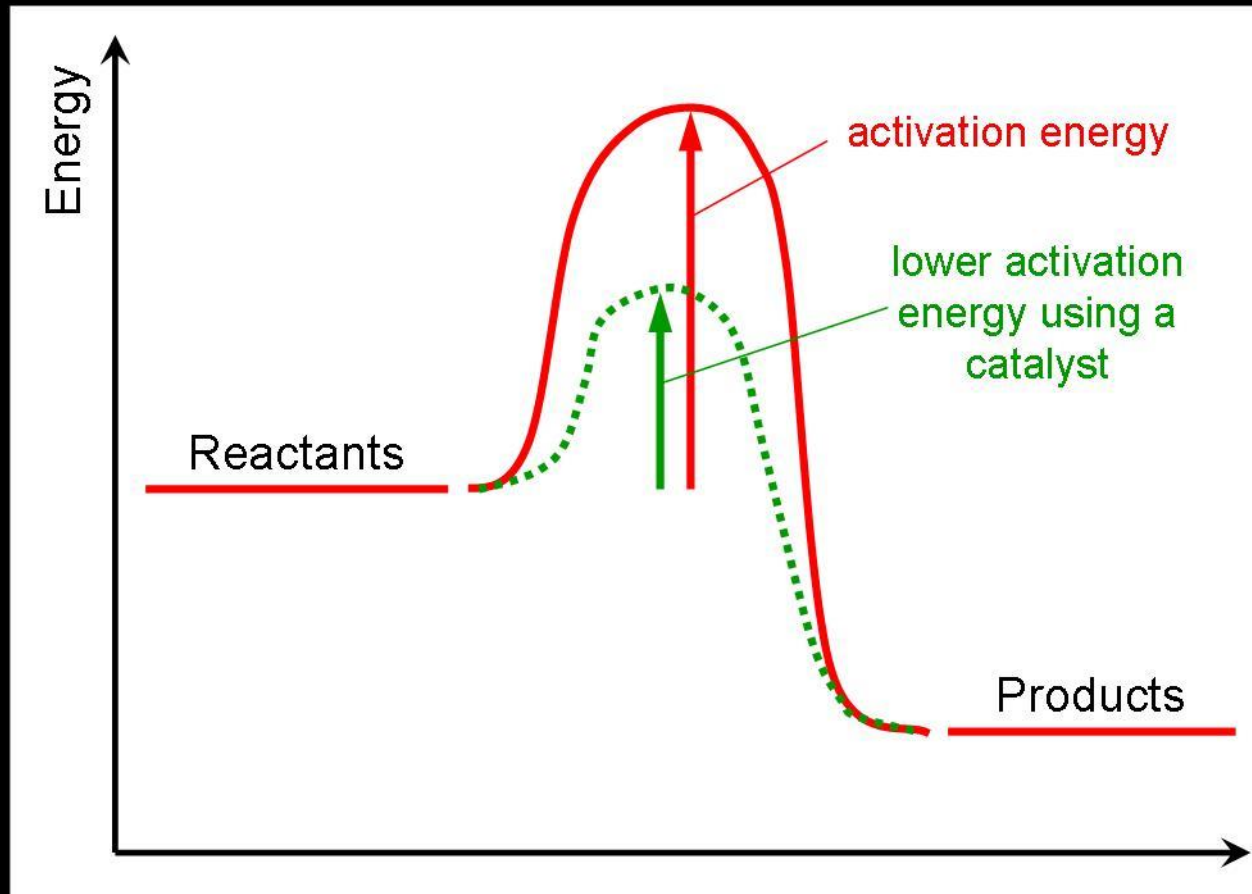
- Define the following terms: enzyme, catalyst, substrate, enzyme-substrate complex, and denature
- Describe how enzymes lower the activation energy of a chemical reaction

Activation Energy



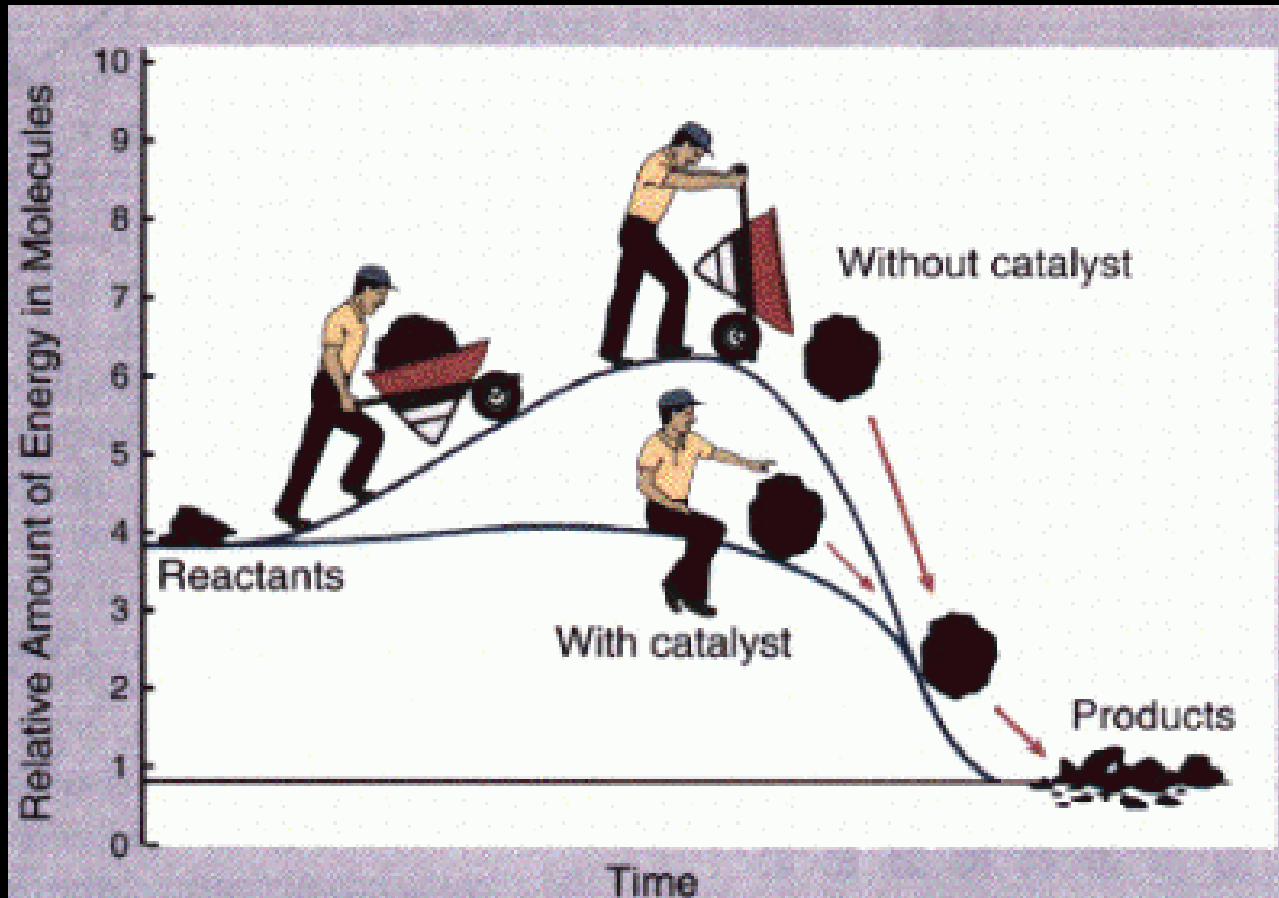
Activation energy - the amount of energy required for a chemical reaction to get started.

Catalysts



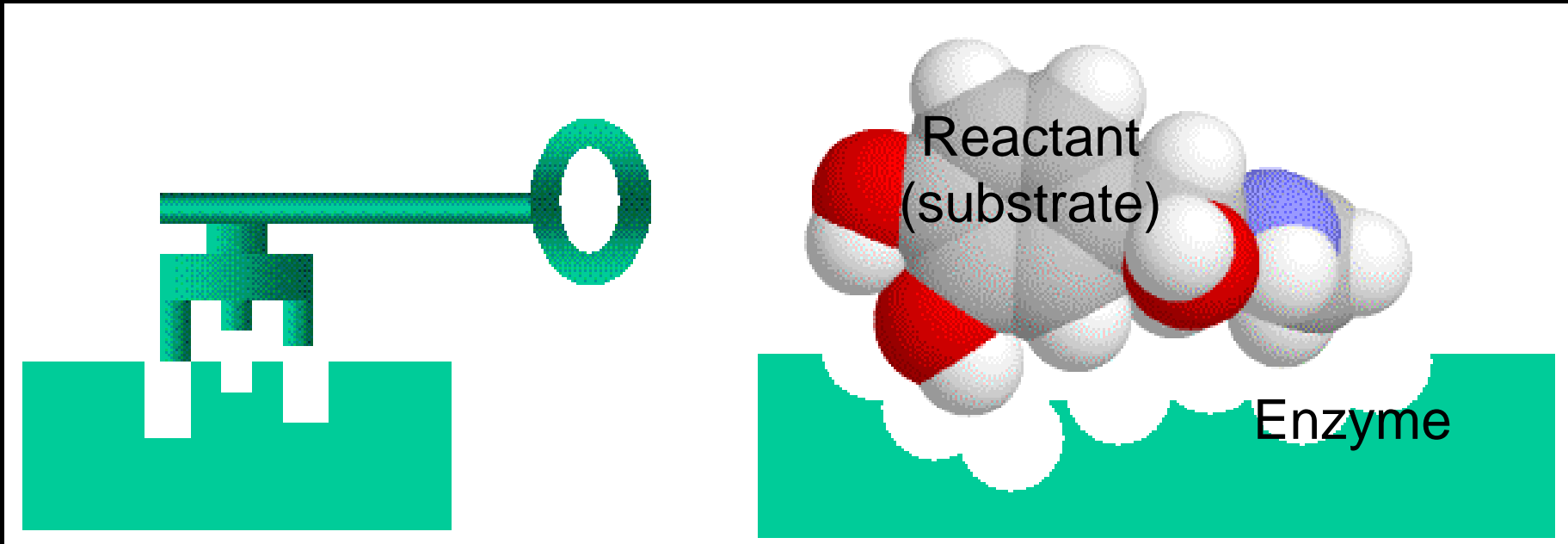
A **catalyst** is a substance that speeds up the rate of a chemical reaction. Catalysts lower the activation energy.

Enzymes are Catalysts



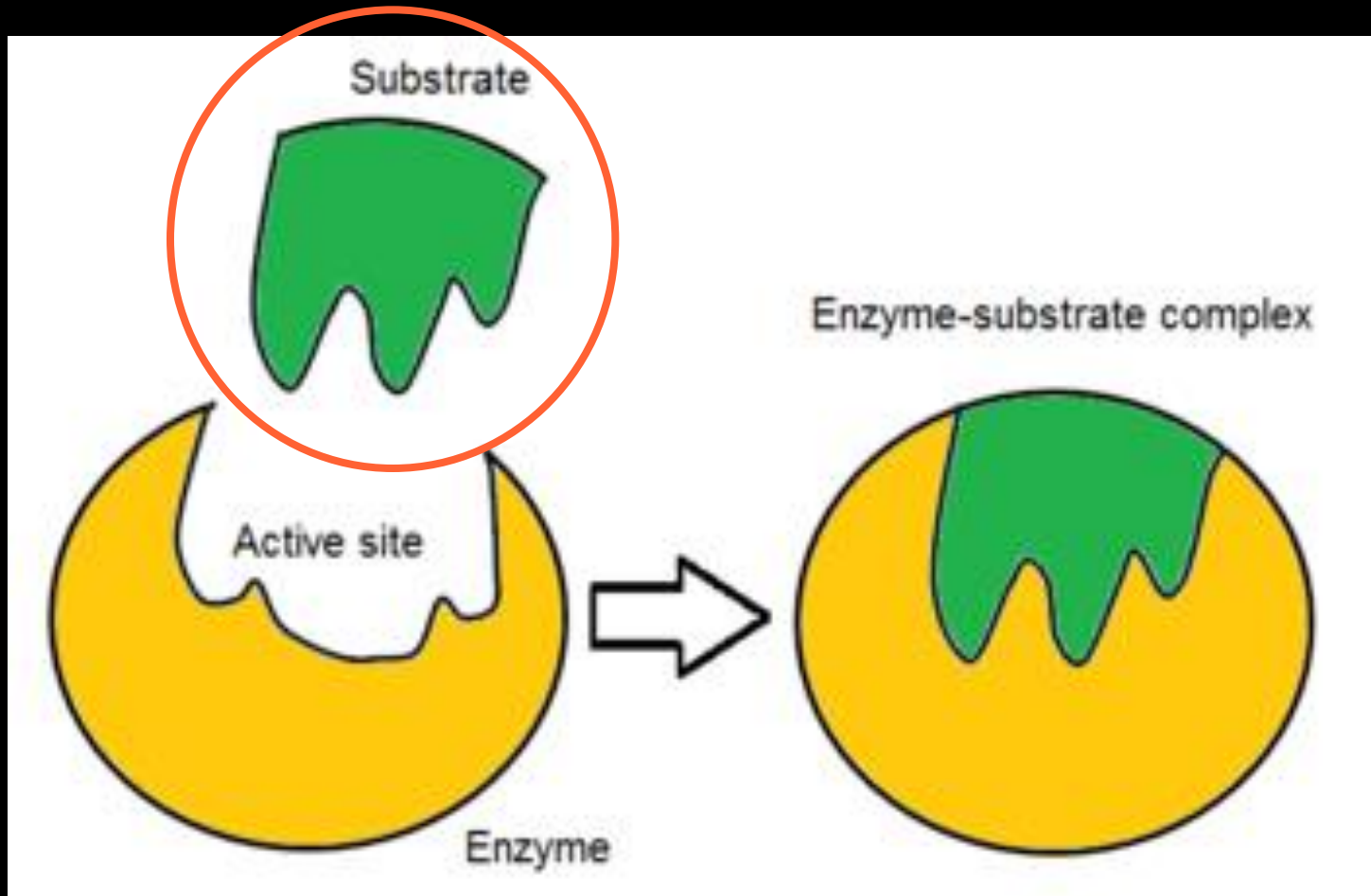
Enzymes are proteins that act as **biological catalysts**.

Enzymes are specific



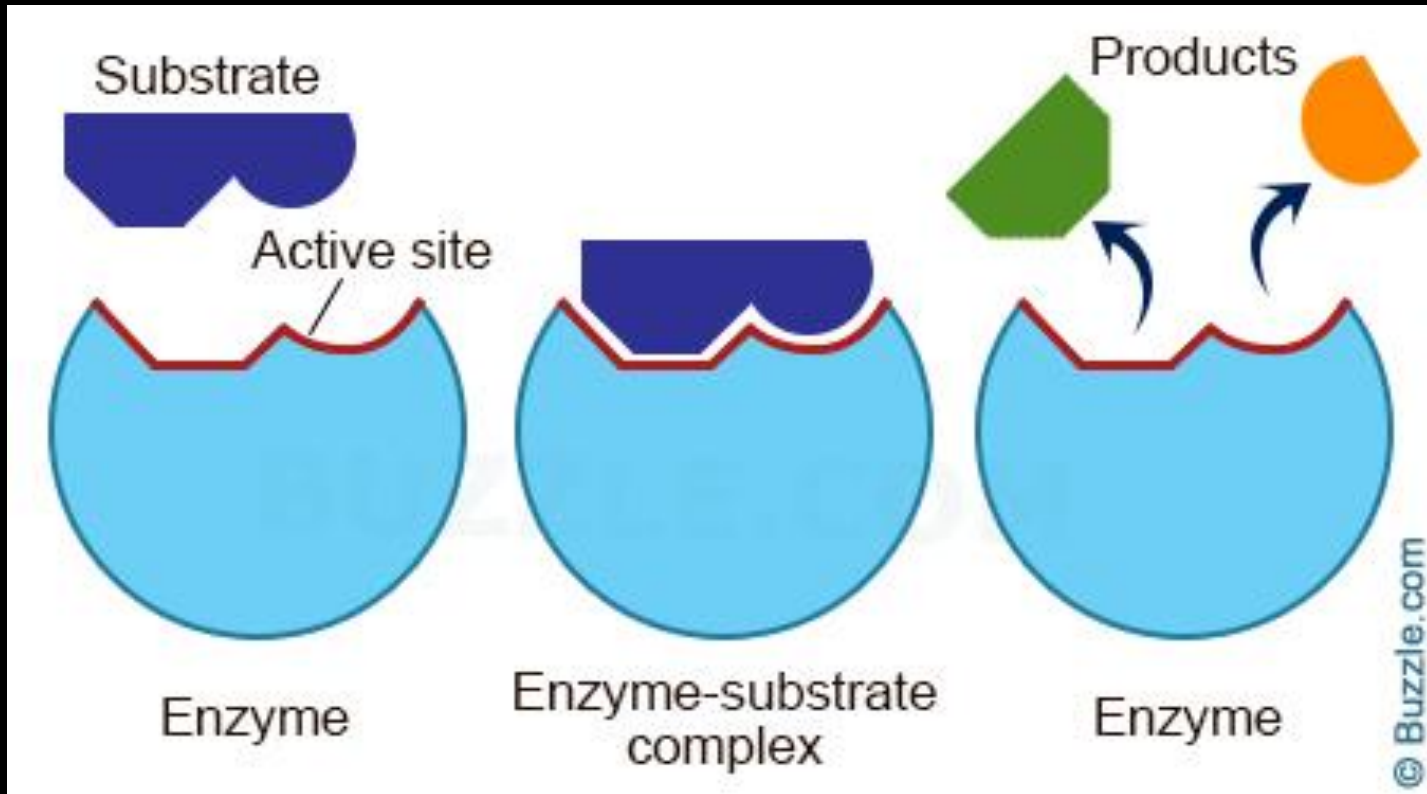
Enzymes are **very specific**, generally catalyzing only one chemical reaction.

Substrate



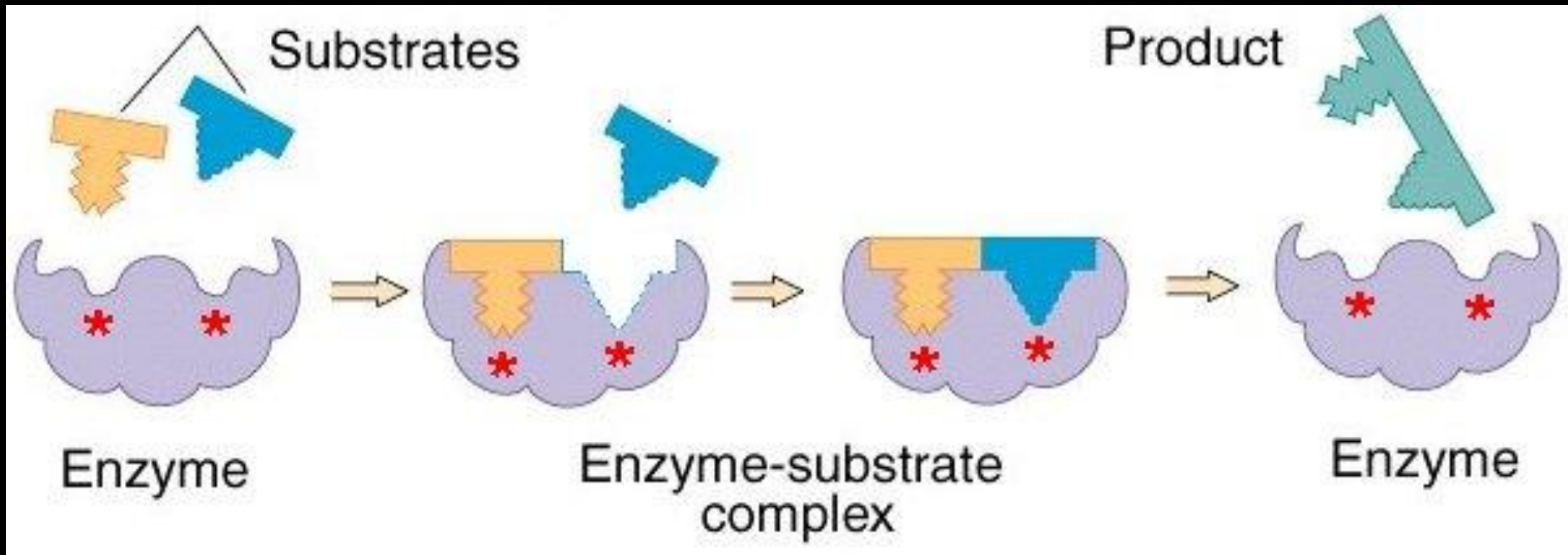
Substrate - reactant of enzyme-catalyzed reactions

Enzyme-Substrate Complex



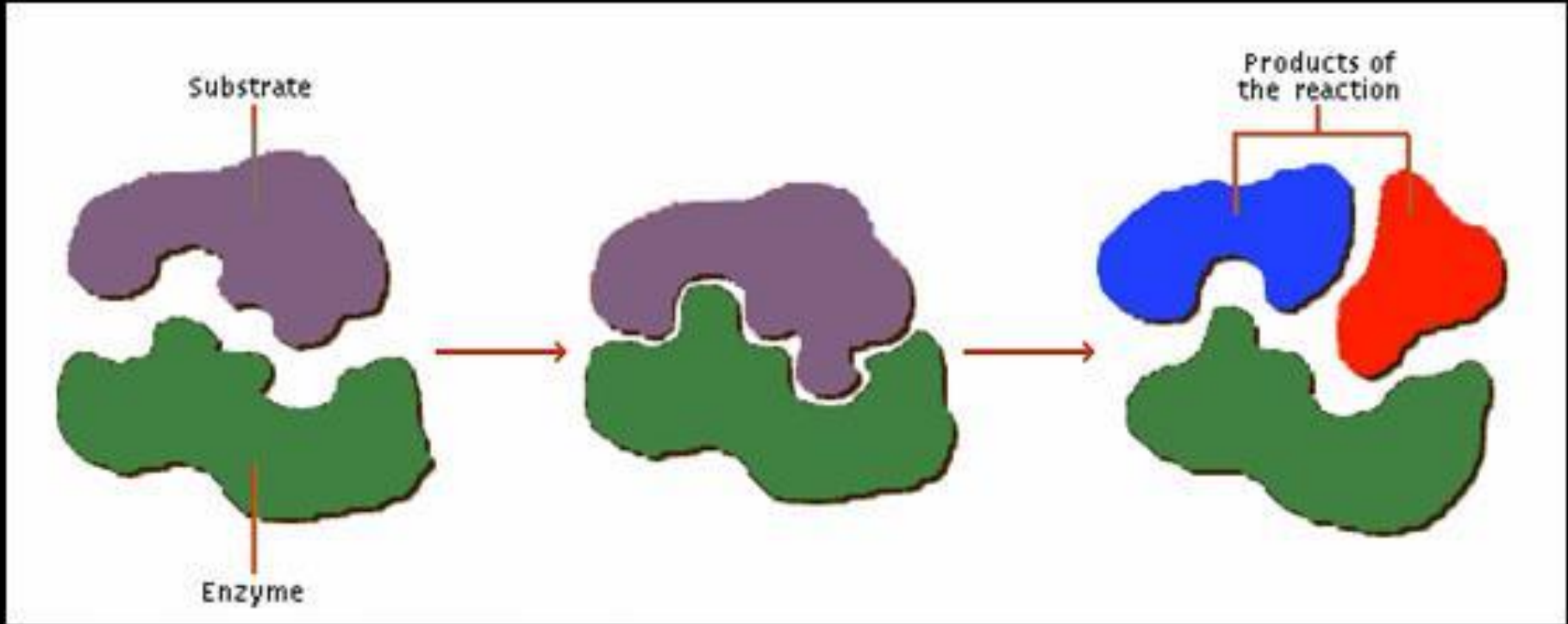
Enzymes provide a site where reactants can get together to complete a chemical reaction.

Synthesis reaction



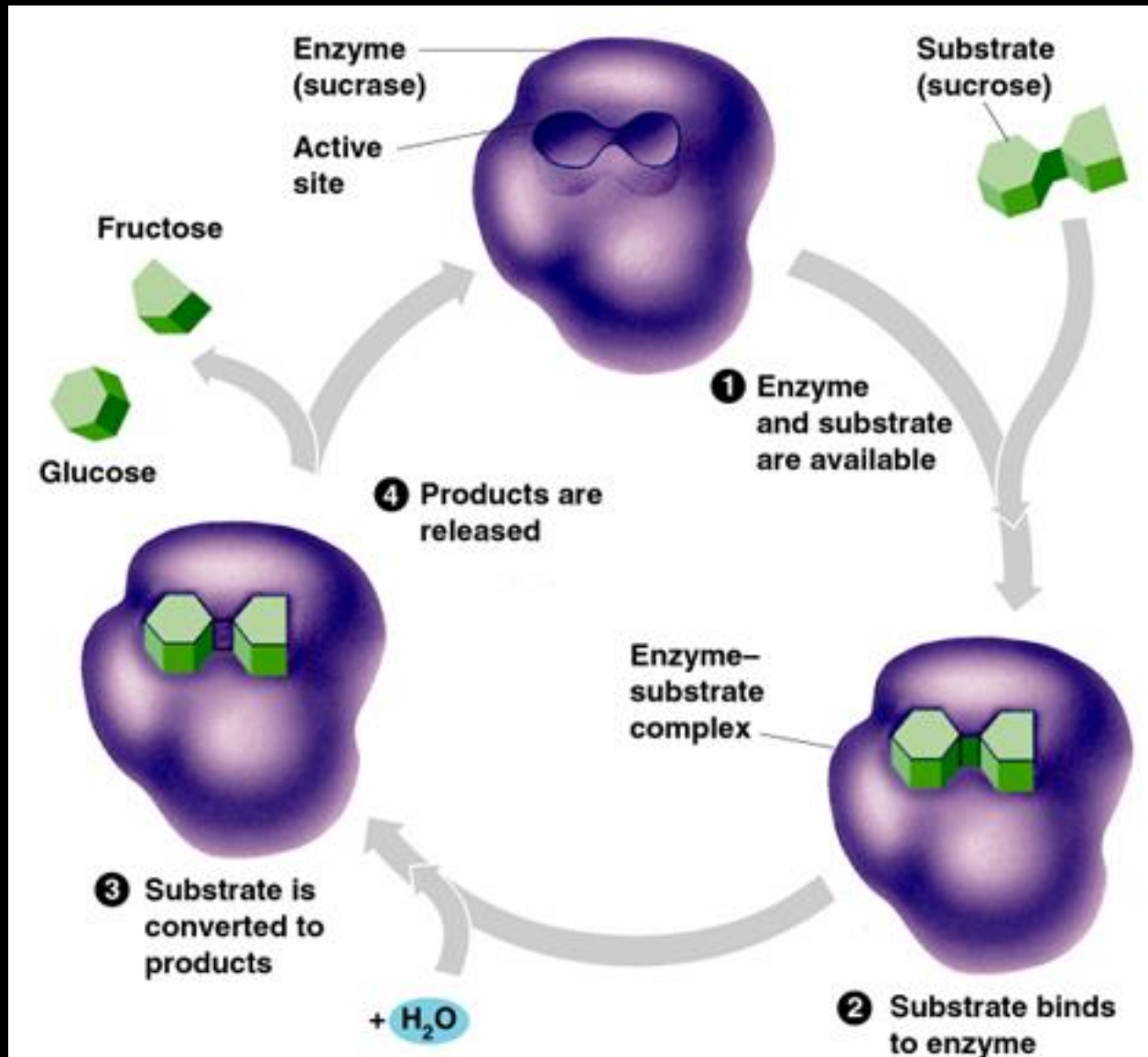
Several substrates attach to the enzyme, which synthesizes a new molecule (product)

Decomposition reaction

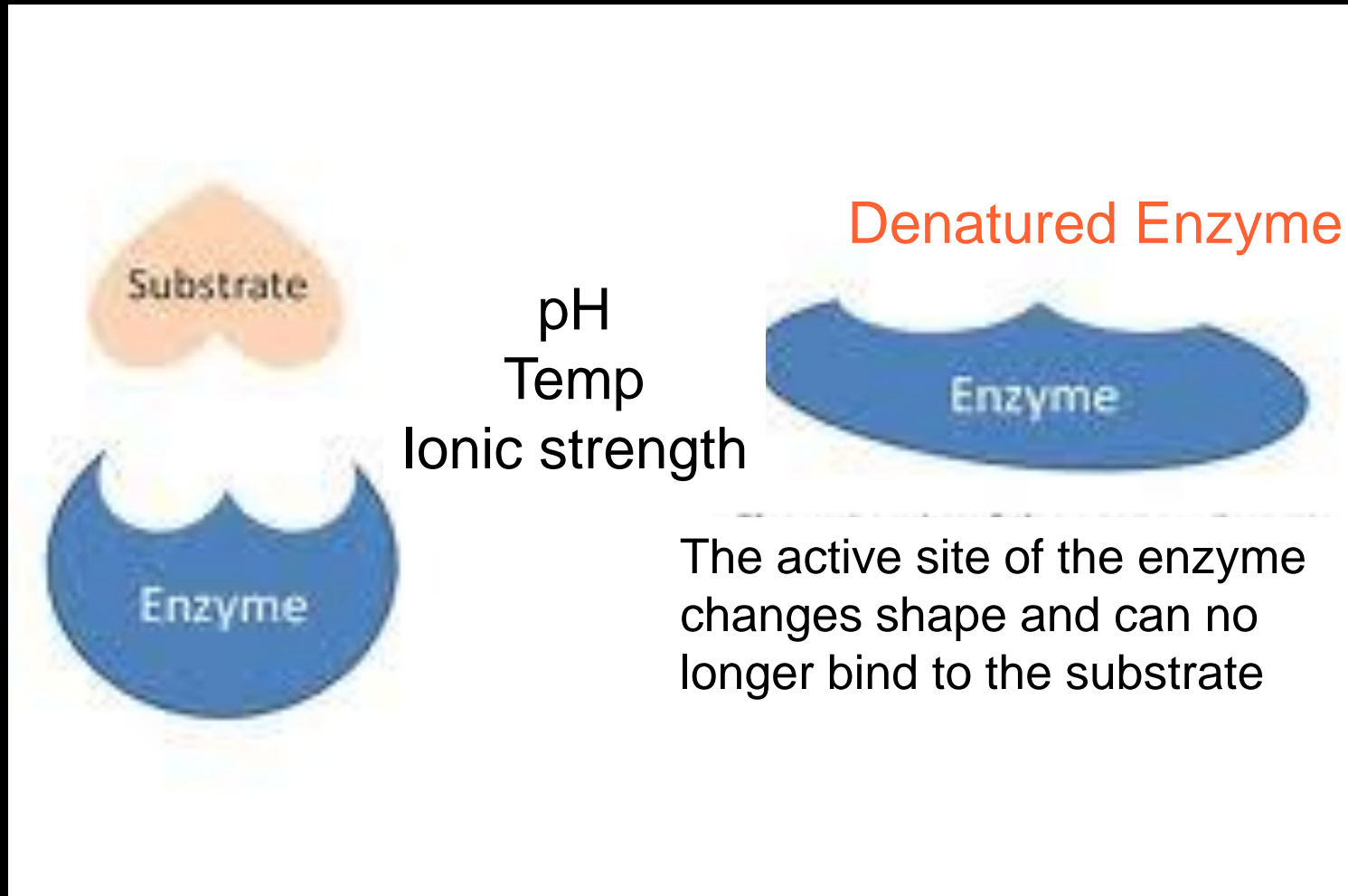


One substrate attaches to the enzyme, which breaks down the molecule into several products

Enzymes can be reused over and over again!



Regulation of Enzyme Activity



pH, temperature and ions can denature (change the shape) of an enzyme.

Function of Enzymes

- Regulating chemical pathways
- Making materials that cells need
- Releasing energy
- Transferring information

YouTube
Amoeba Sisters
Enzymes

You can change the direction



Just by thinking about it