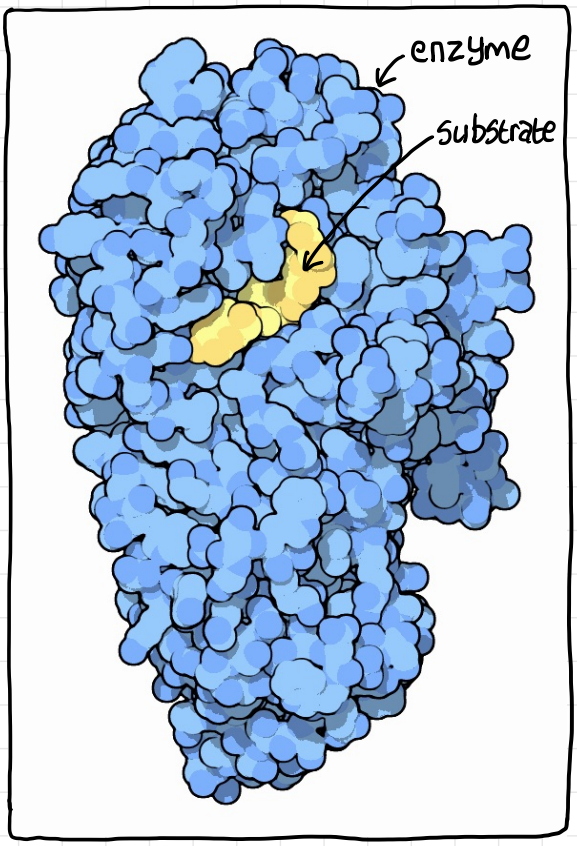
Introduction to enzymes

Properties of enzymes



Enzymes are folded **proteins** whose function depends on their 3-D shape.

Enzymes are biological **catalysts.** A catalyst is a substance that changes the rate of a reaction but is not used up.

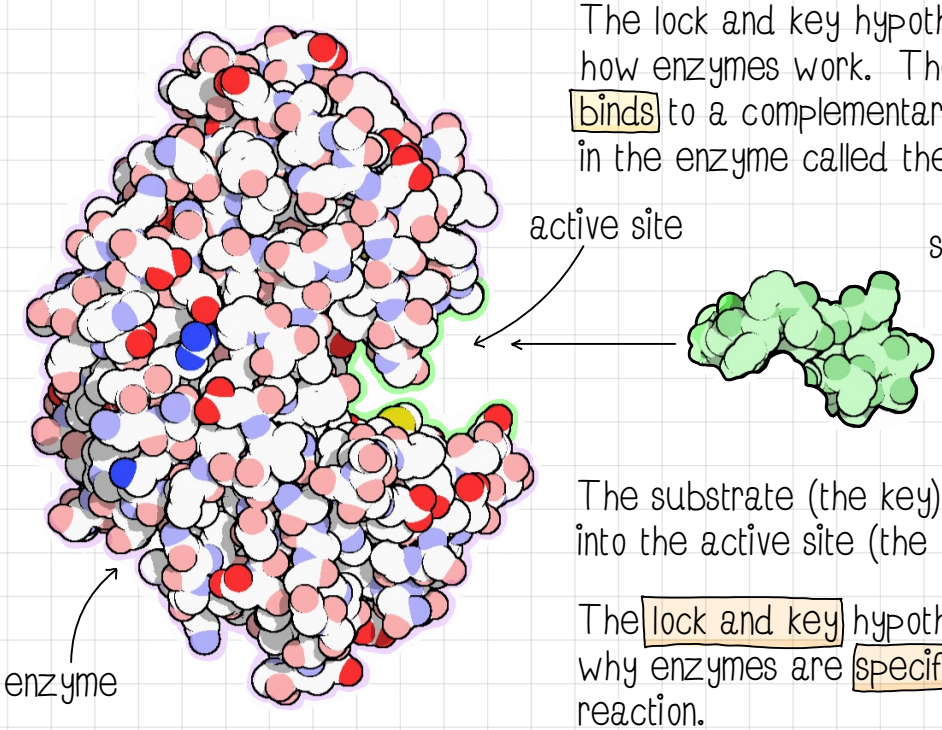
Enzymes are **specific** for one reaction.

Enzyme **activity** is affected by **temperature** and **pH.**

At high temperatures enzymes are **denatured** (lose their 3-D shape) and stop working

Enzyme names usually end in **-ase**

The lock and key hypothesis



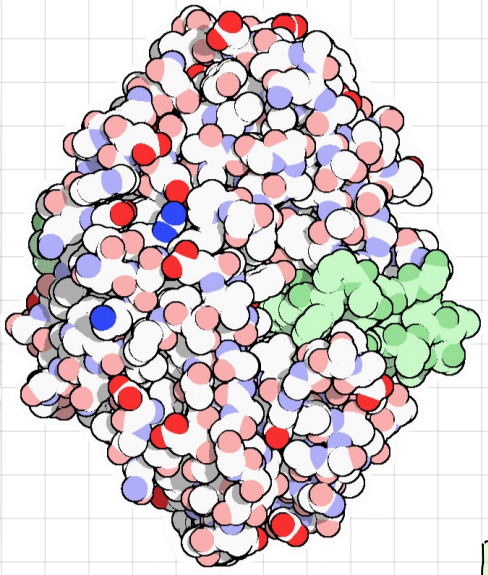
The lock and key hypothesis suggests how enzymes work. The **substrate** **binds** to a complementary shaped area in the enzyme called the **active site.**

The substrate (the key) fits exactly into the active site (the lock).

The **lock and key** hypothesis explains why enzymes are **specific** to only one reaction.

Introduction to enzymes...

Binding of the substrate

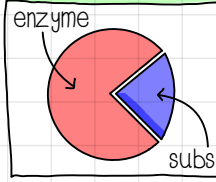


The substrate binds to the active site. This forms the enzyme/substrate complex.

A denatured enzyme does not have an active site as it has lost its shape so no enzyme/substrate complex can form.

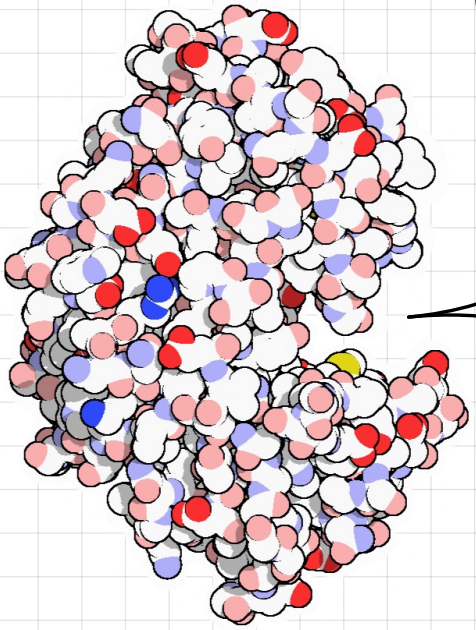
The enzymes lowers the activation energy of the reactions. This allows reactions to take place at body temperature

Simple diagrams



enzyme diagrams can be simplified using simple pictures to show how they work.

Formation of products



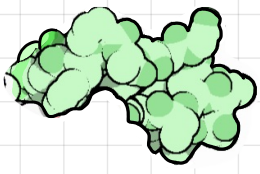
products

After the reaction the products are released from the active site.

Enzymes can catalyse two reactions. They can break down a substrate into products and they can join the products to reform the substrate.

Example of catalysis

substrate



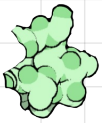
protein

enzyme

products

amino acid

+



amino acid

watch video