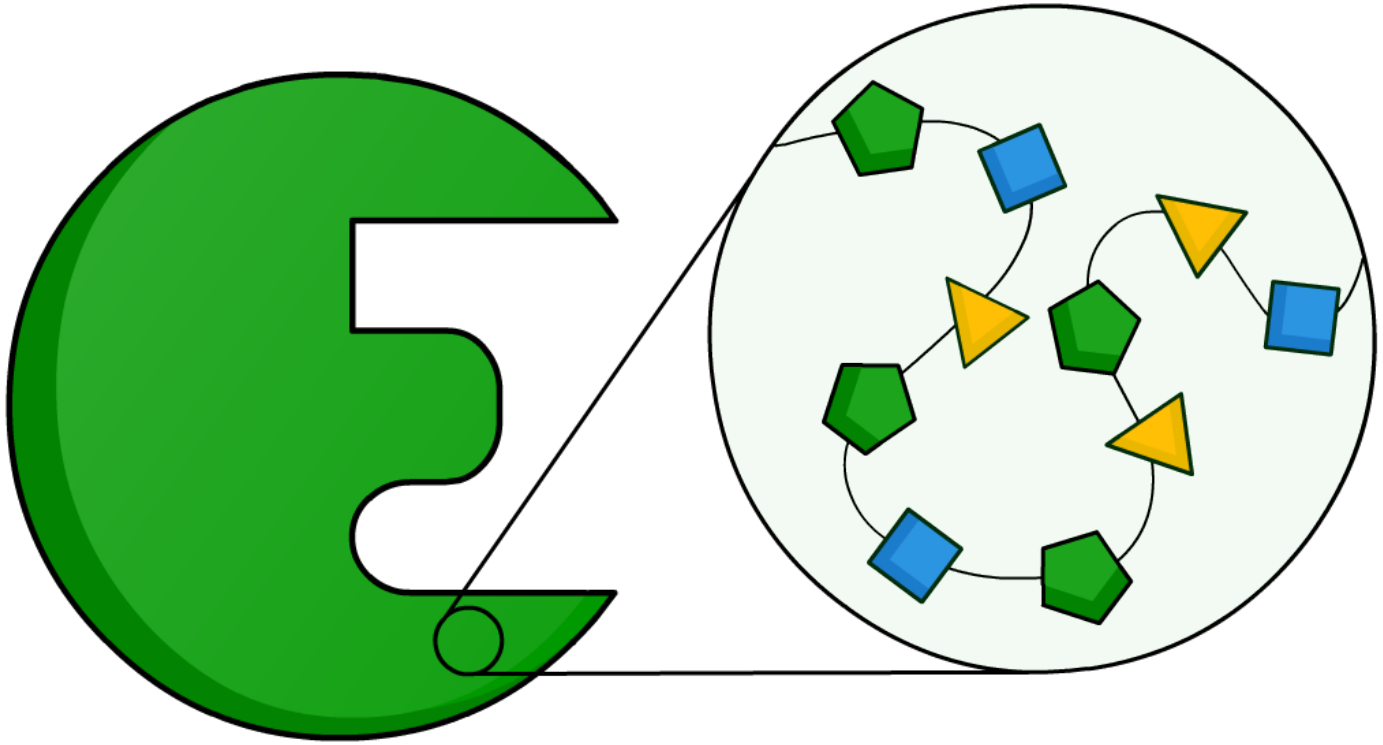
Enzyme Shape

What are enzymes made of?

Enzymes are protein molecules, and so are made up of **amino acids**. Most enzymes contain between 100 and 1,000 amino acids.

These amino acids are joined together in a long chain, which is folded to produce a unique 3D structure.

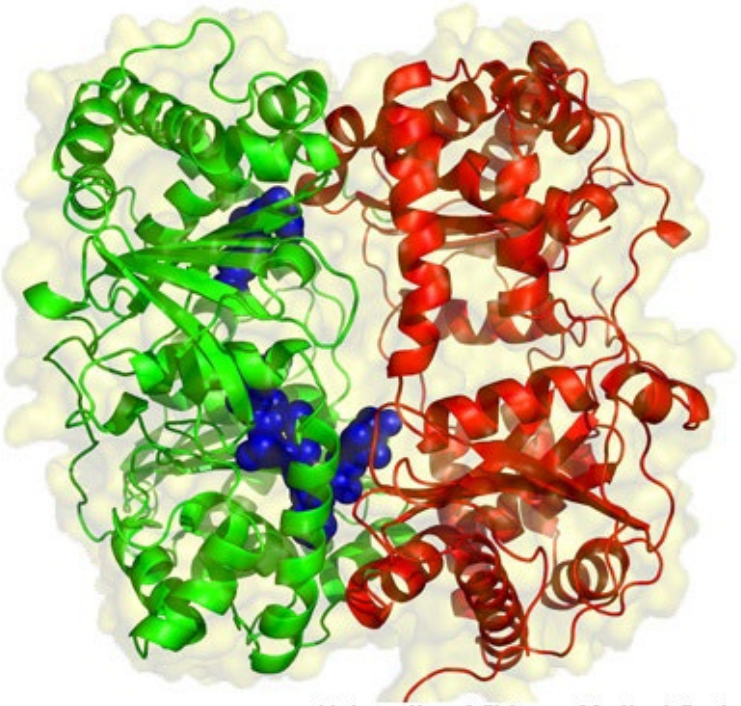


Why is shape important?

The shape of an enzyme is very important because it has a direct effect on how it catalyzes a reaction.

Why do enzymes have different shapes?

An enzyme's shape is determined by the sequence of amino acids in its structure, and the bonds which form between the atoms of those molecules.



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Different types of enzymes have different shapes and functions because the order and type of amino acids in their structure is different.

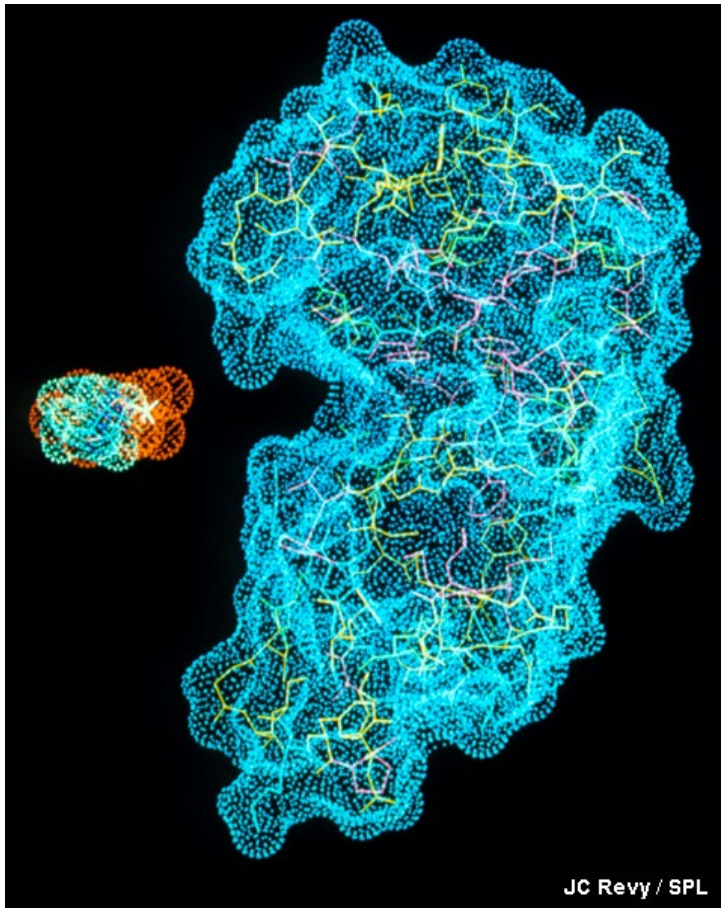
Enzymes: true or false?

Why are enzymes so specific?

Enzymes are very specific about which reactions they catalyze. Only molecules with exactly the right shape will bind to the enzyme and react. These are the **reactant**, or substrate, molecules.

The part of the enzyme to which the reactant binds is called the **active site**.

This is a very specific shape and the most important part of the enzyme.



What happens at the active site?

In the same way that a key fits into a lock, so a substrate is thought to fit into an enzyme's active site. The enzyme is the **lock**, and the reactant is the **key**.

enzyme + reactant ↔ **enzyme-reactant complex** ↔ **enzyme + products**

The lock and key model

What is the 'lock and key' model?

Enzymes are very large molecules, but only a small part of their structure, the active site, is directly involved in reactions.

Click "**play**" to find out more about the 'lock and key' model.