Enzymes

- They are catalysts; they lower the activation energy thus increasing the rate at which reactions occur.
- Enzymes- Large Protein molecules. (They are made up of proteins)
- Tertiary Structure; folded into a specific shape. They can also be quaternary structure as well.
- They have a globular active site.
- Enzymes are substrate specific.
- The shape of the enzyme will determine which substrate it will act on.
- Some enzymes require coenzymes or cofactors to function properly.
- The shape of an enzyme can be altered or denatured and the enzymes won't function as it is supposed to.
- High heat and extreme pH can denature an enzyme.
- Complete Active site and co-factor together are called- Holoenzyme
- The protein part without the co-factor is – Apoenzyme
- METABOLISM= ANABOLISM + CATABOLISM

Examples of Non-Protein ''partners'' of enzymes.

(Inorganic) Cofactors; Iron, copper, zinc

(Bind loosely to Enzyme) Coenzymes; Biotin, Coenzyme A, NAD, FAD, ATP

(Bind tightly to Enzyme) Prosthetic Groups; Heme, Flavin, Retinal

Reaction Mechanism

In a chemical reaction substrate is converted into a product. S -> P

In an enzyme-catalysed reaction, the substrate;

1. Binds to active site and it forms Enzymes-Substrate Complex
2. Converted into product while attached to enzyme.
3. Product is released

Molecule Geometry

-Lock and Key mechanism

Induced fit mechanism;

- This is the change in shape of the active site of an enzyme, so it binds more exact to the substrate and an enzyme substrate complex can form. The reaction is then catalysed and an *Enzyme-Product complex forms*.