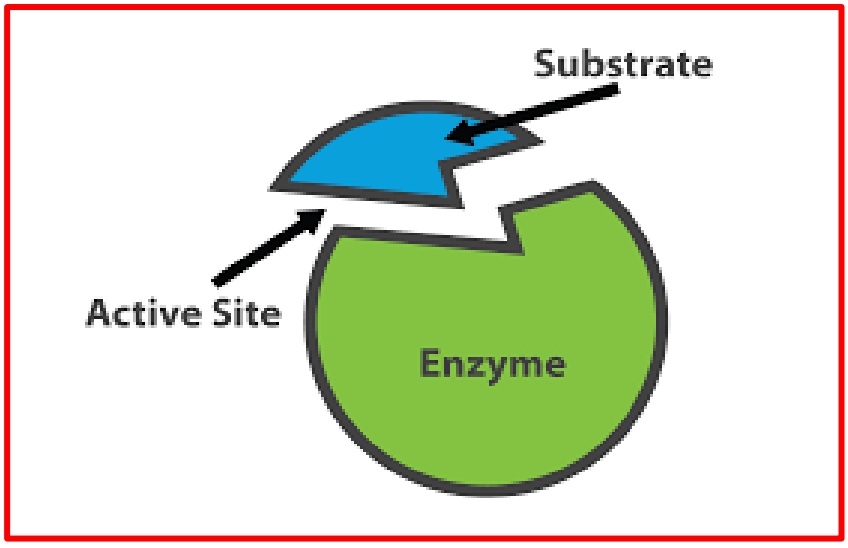
Enzymes

Are proteins that help speed up chemical reactions in our bodies. Enzymes are essential for digestion, liver function and much more.

What are enzymes and its types?

enzymes are divided into six functional classes and are classified based on the type of reaction in which they are used to catalyze. The six kinds of enzymes are **hydrolases, oxidoreductases, lyases, transferases, ligases and isomerases.**



Each enzyme is made up of a unique chain of amino acids and has a unique shape. It can assume any of the three types of structure – primary, secondary, and tertiary structure. Enzymes made of amino acids that are arranged in a polypeptide chain

produce the primary structure. The formed amino acid chain is called a polypeptide.

Type and Enzyme Function:

Cellulase Breaks down cellulose, a fiber found in the cell walls of all plants and trees. Cellulose is the basic raw material used to make products such as paper, cotton, and other textiles

Amylase Break down starches and other carbohydrates into basic sugars

Protease Breaks down proteins

Lipases Breaks down fats.

What Happens to an Enzyme after a Biochemical Reaction?

After the reaction, the products formed are released from the active site of the enzyme. The enzyme remains unaltered at the end of the reaction and thus is free to bind another substrate and catalyze a new reaction.

Biotechnology and Enzymes

Biotechnology can provide an unlimited and pure source of enzymes as an alternative to the harsh chemicals traditionally used in industry for accelerating chemical reactions

Enzymes are found in naturally occurring microorganisms, such as bacteria, fungi, and yeast.

Large quantities of enzymes are often needed for industrial use, so these microorganisms are multiplied through a process called **fermentation**

Enzyme Biotechnology in the Paper Industry
Enzymes have been used in paper industry to soften wood fibres

Enzyme Biotechnology and Biofuels
Enzymes may be used to help produce fuels.

Medical Application The variety of enzymes and their potential therapeutic applications are considerable.

the most successful applications:

1-purely topical uses

2-the removal of toxic substances

3-treatment of life-threatening disorders within the blood circulation.

Some important therapeutic enzymes

Enzymes as therapeutic agents

Enzyme	The use of enzymes
Trypsin, lipase, amylase	Disturbances of the digestion
Urease	Removal of urea from the body in the "artificial kidney"
Ribonuclease, deoxyribonuclease	Antiviral drugs against herpetic keratitis, adenoviral conjunctivitis
Streptokinase, urokinase	Preventing blood clots during operations
Asparaginase	Treatment of leukemia

Enzymes used in detergents industry are stable, and safe to use. Currently, protease and amylase enzymes are incorporated into detergents. Lipase enzymes break down too easily in washing machines to be very useful in detergents

Enzymes important both economically and environmentally