

Clinical uses of enzyme \Rightarrow

Enzymes are proteins which catalyse the biological reactions in an animal. They are responsible for supporting almost all the chemical reactions that maintain the animal's homeostasis.

Almost all significant life processes depend on enzyme activity. Enzymes enhance the rate of reaction about 106 times more than non-catalysed reaction. Enzymes are found in almost all tissues and fluids of the body.

Clinical enzymology deals with the application of enzyme analysis for diagnosing and treating disease. It gained importance with the introduction of serum alkaline phosphatase ~~(ALP)~~ as a diagnostic aid by King & Armstrong in 1927. The measurement of serum levels of numerous enzymes in the plasma is used as an indicator of disease of a particular organ.

There are several factors like pH, temperature, concentration of substrate for enzyme's catalytic activity. Inhibitors are substances that reduce or even stop the catalytic activity of enzymes.

Enzymes of secretion include amylases, phosphatases, and lipases. Their normal plasma levels are relatively low and constant as they are rapidly disposed of through excretory channels such as the intestinal ~~to~~ urine and bile. These enzymes are either in the cell wall or in membrane-bound organelles.

The elevation of serum enzyme activity can be due to increased cell membrane permeability, cell death, increased enzyme production.

Increased cell membrane permeability can be due to the effect of infectious agents, physical radiation, ~~and~~ chemical drugs, lead, mercury, alcohol, viruses, bacteria, fungi etc.

There are nine enzymes of clinical significance we will discuss about.

1. Aspartate amino transferase (AST)
2. Alanine amino transferase (ALT)
3. Creatine Kinase (CK)
4. Lactate dehydrogenase (LDH)
5. Alkaline phosphatase (ALP)
6. Acid phosphatase (ACP)
7. Amylase (AMS)
8. Lipase (LPS)
9. Glucose-6-phosphate dehydrogenase (G-6-PD)