

Dr. P. Ahmad.

ROLE OF ENZYMES IN DIGESTION ①

- * Biological catalysts produced by living cells
- * They are soluble and colloidal substances
- * Khure 1878 coined the term enzyme.
- * The substance on which enzyme acts is called substrate. Final product is called end product.

Lactose $\xrightarrow{\text{Lactase enzyme}}$ Glucose + Galactose
Substrate End product.

- * Some enzymes are formed of protein only.
Ex amylase, urease, etc.
- * But other ~~protein~~ non protein (Prosthetic group)
- * ~~protein~~ Prosthetic group = Apoenzyme
Apoenzyme + Prosthetic gr = Holoenzyme

Zymase and Zymogen.

Zymase: If an enzyme which is secreted which act upon as such called zymase.
eg. All endoenzyme

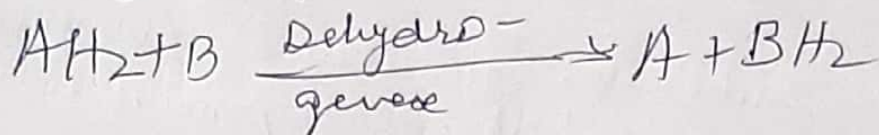
Zymogen: Secreted in inactive form called Zymogen or pro enzyme
E: Trypsinogen \xrightarrow{HCl} Trypsin

(2)

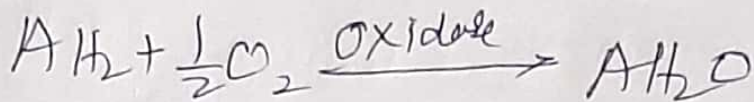
Classification of Enzyme.

① Oxidoreductase - Oxidⁿ + Redⁿ

① Dehydrogenase

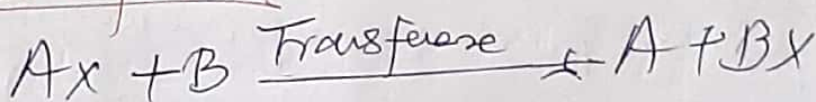


② Oxidase:



(iii) Oxygenase: These are enzymes which catalyze the incorporation of oxygen directly into the substrate.

② Transferase



③ Hydrolase: → Hydrolysis

④ Lyase: Removal a group of atom from their substrate leaving double bond or add gr. to double bond.

⑤ Isomerase: Catalyze isomerization.

⑥ Ligase or Synthetase: Catalyze synthesis reaction by joining two molecules.

Mechanism of Digestion

Carbohydrate:

- Starch $\xrightarrow[\text{6.8 pH}]{\text{salivary amylase}}$ Erythro maltose
- Erythromaltose $\xrightarrow[\text{6.8 pH}]{\text{salivary amylase}}$ Achromaltose
- Achromaltose $\xrightarrow[\text{6.8 pH} + \text{Cl}^-]{\text{salivary gland}}$ Maltose + Isomaltose + Dextrin
- Maltose $\xrightarrow{\text{Maltase}}$ Glucose + Glucose
- Isomaltose $\xrightarrow{\text{Isomaltase}}$ 2 glucose
- limit dextrin $\xrightarrow[\text{dextrinase}]{\text{limit}}$ 2 Glucose
- Lactose $\xrightarrow{\text{Lactase}}$ Glucose + galactose
- Sucrose $\xrightarrow{\text{Sucrase}}$ Glucose + fructose

Products of carbohydrate digestion are absorbed ~~by~~ from the small intestine into blood. Monosaccharides like fructose are absorbed by passive diffusion which is slow. Glucose and Galactose are absorbed by active transport.

A mobile carrier molecule in mucosal cell membrane binds both Na^+ and glucose from the lumen. It transport them and release them into cytosol.

once the mobile carrier molecule ⁴ releases Na^+ glucose into the cytosol it return back to pick up to new glucose molecule. This need energy ATP which obtained by Na^+ pump.

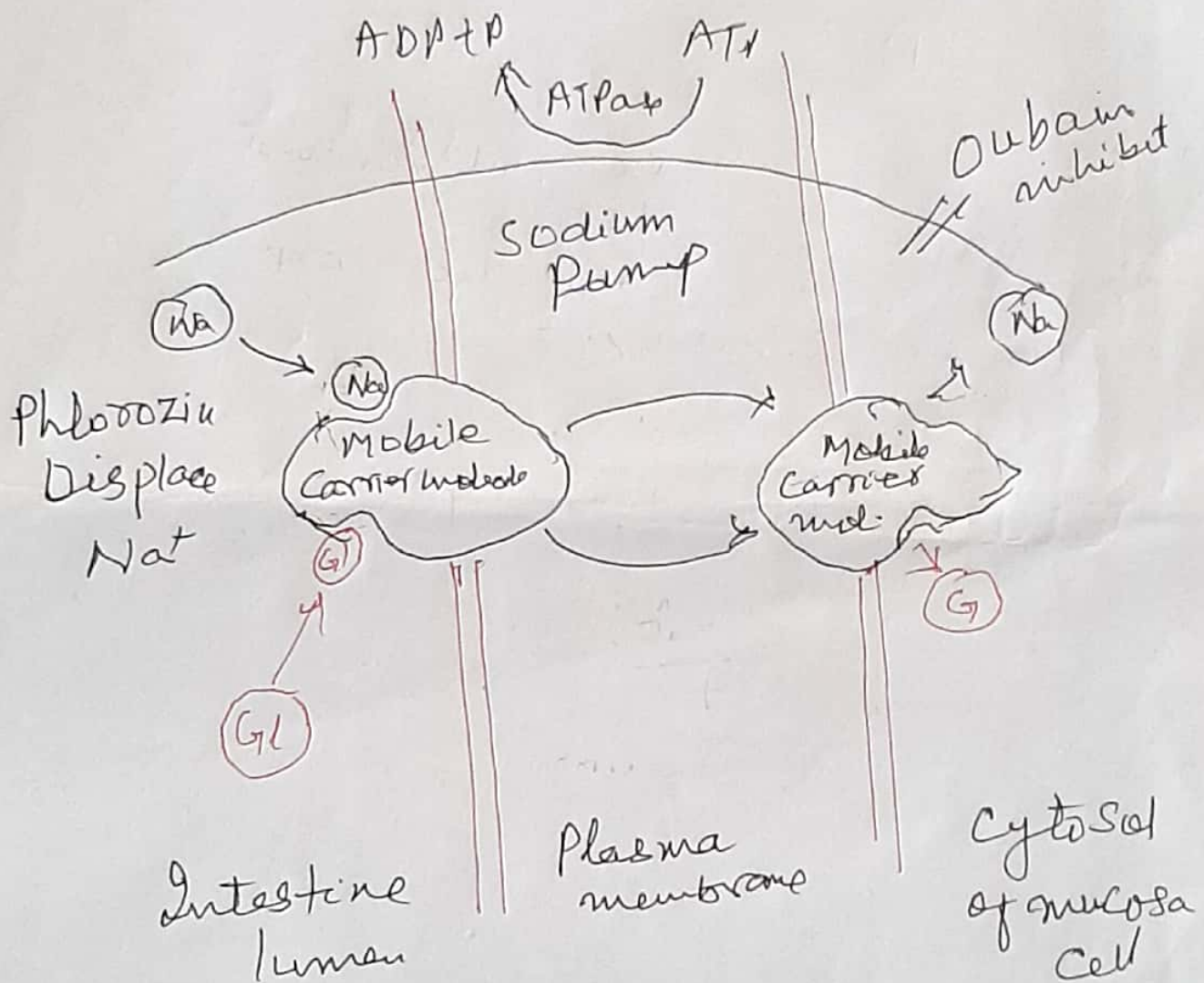


Fig. Model explain absorption of glucose by intestinal mucosal cell.