

Digestion and Absorption



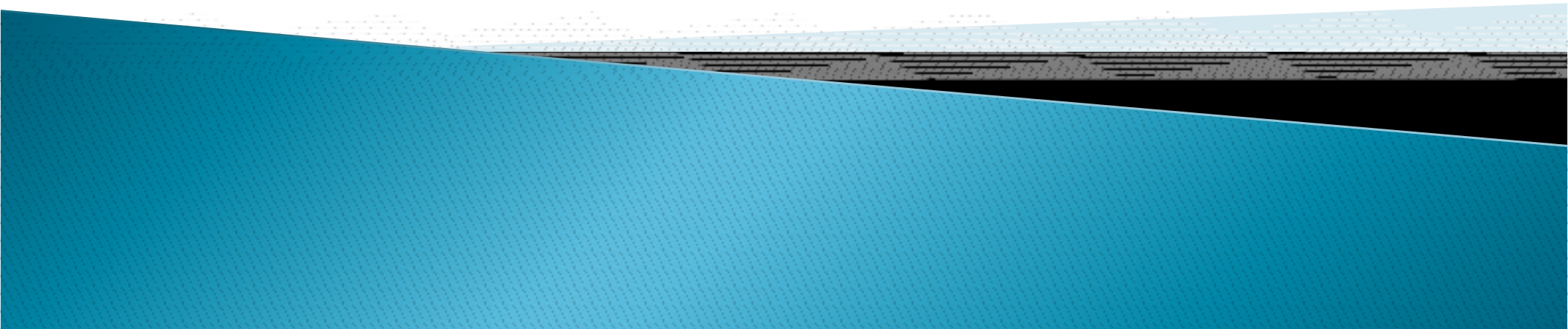
Digestion and Absorption

- ⊠ Carbohydrates, proteins and lipids are digested and absorbed in the small intestine
- ⊠ Absorption
 - The surface area for absorption in the small intestine is greatly increased by the presence of the brush border
 - Pathways of Absorption
 - cellular
 - paracellular

Structure of intestinal wall

- ⊠ Longitudinal folds (finger-like villi)
 - longest in duodenum & shortest in ileum
 - increases surface area 600 fold
- ⊠ The significance of villi & microvilli
 - increase the surface area
 - maximizing the exposure of nutrients to digestive enzymes


Digestion and absorption of carbohydrates



IN THE MOUTH

- ⊠ Salivary amylase digest starch, glycogen and dextrin producing smaller molecules like maltose, glucose

IN THE STOMACH

- ⊠ No digestion of carbohydrates take place in the stomach as no carbohydrate splitting enzyme is present in stomach
 - ⊠ Hydrolysis of some sucrose take place because of HCL into fructose and glucose
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IN THE DUODENUM


- ⊠ Bolus has been act by pancreatic amylase causes hydrolysis of alpha 1,4 linkages
- ⊠ Also act by intestinal amylase in intestinal juice liberating free glucose molecules.

Other Intestinal Enzymes

- ⊠ LACTASE beta galactosidase pH is 5.4 to 6.
Hydrolyse lactose to glucose and galactose
- ⊠ ISOMALTASE catalyses the hydrolysis of alpha 1,6 linkages splitting alpha limit dextrin producing maltose and glucose
- ⊠ MALTASE hydrolyze alpha 1,4 linkage between glucose units in maltose.

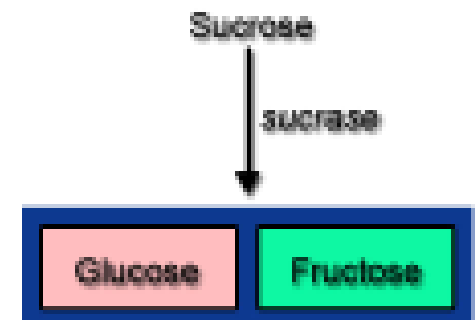
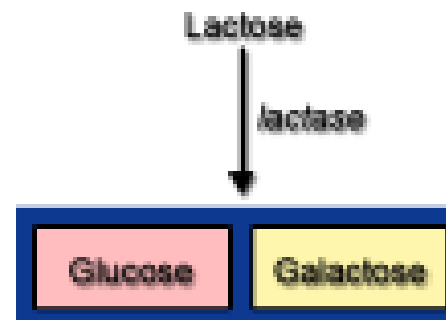
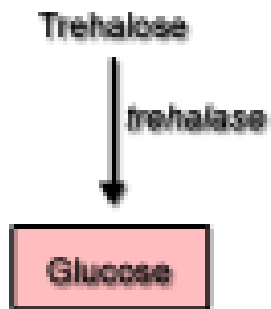
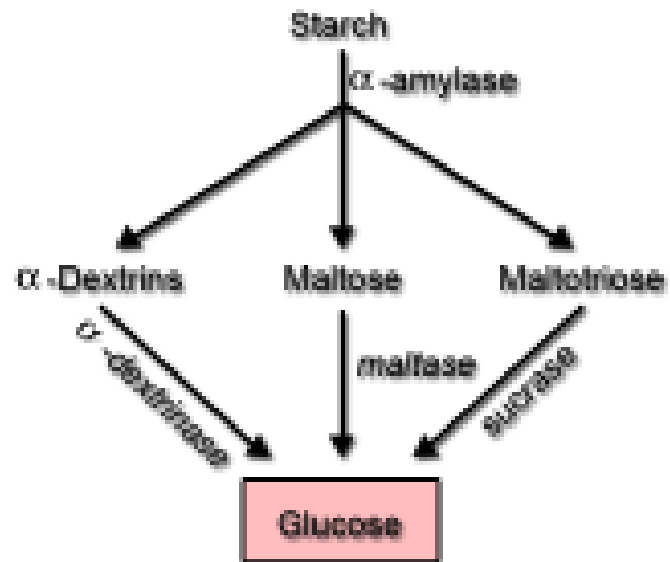
- ⊠ Optimum pH is 5.8 to 6.2
- ⊠ SUCRASE Ph 5 to 7. Produce fructose and glucose from sucrose.

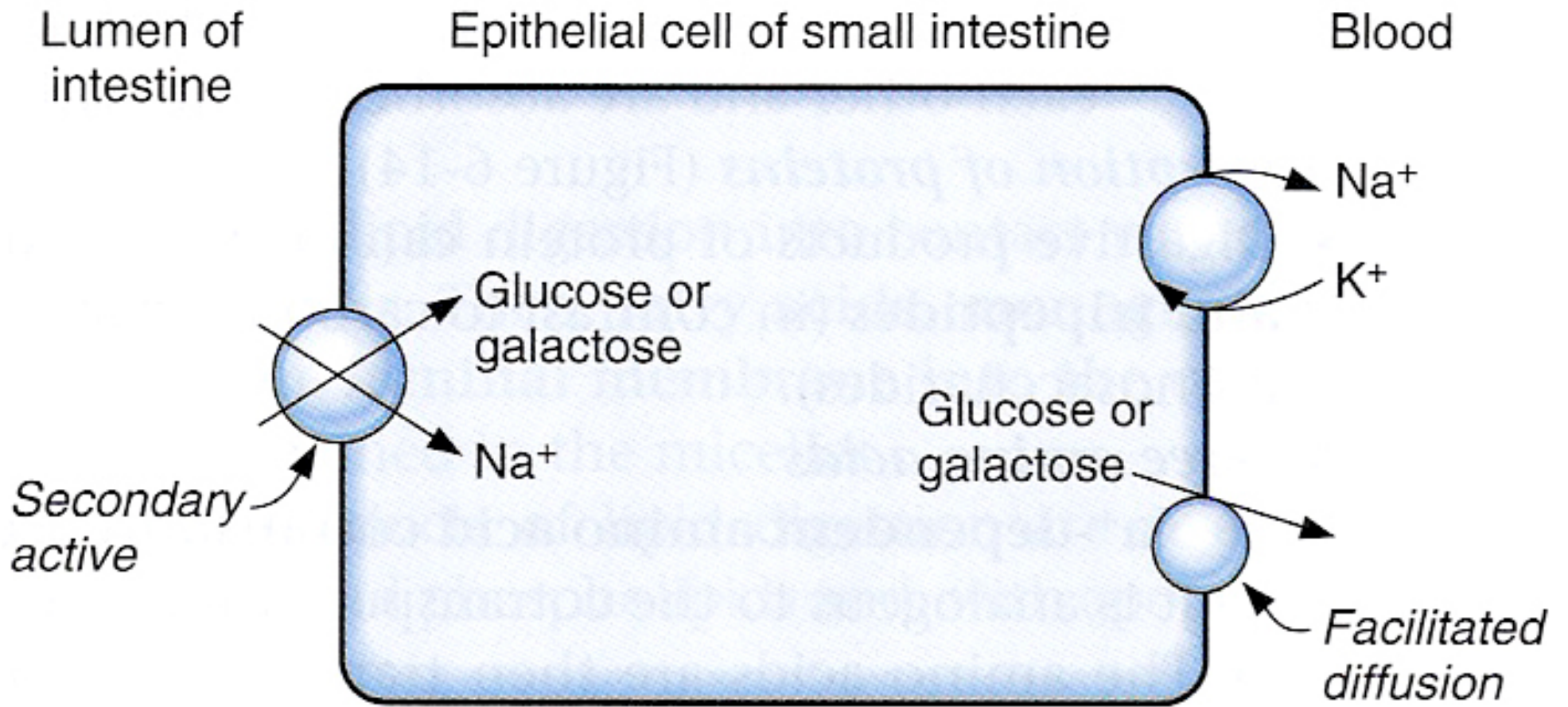
Absorption of Carbohydrates

- ⊠ Glucose and Galactose by active transport with the help of carrier proteins
 - ⊠ Carrier proteins have two binding sites
 - ⊠ One for sodium and one for glucose
 - ⊠ Four glucose transporters Glut1, Glut2, Glut3 & Glut4
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- ⊠ Sugars like fructose and mannose absorb by facilitated diffusion

CARBOHYDRATE DIGESTION





Carbohydrate malabsorption

- ⊠ Lactose malabsorption syndrome
 - Symptoms
 - gurgling noises in the intestine
 - flatulence
 - diarrhea
- ⊠ Sucrase-isomaltase deficiency
 - decrease level of sucrase
 - suppression of transporter protein
- ⊠ Glucose-galactose malabsorption syndrom
 - deficiency in transporter protein