

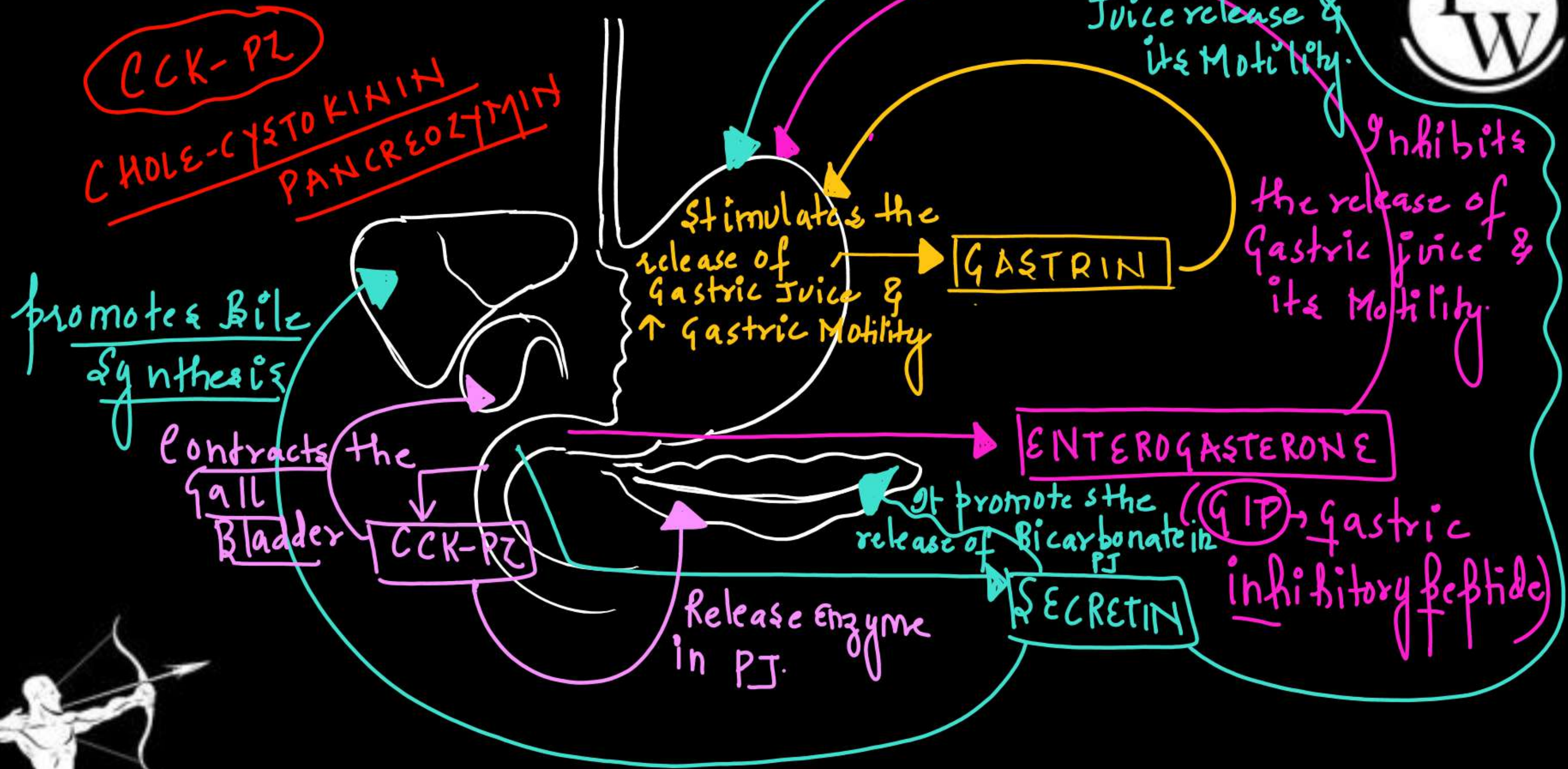


ARJUNA NEET BATCH

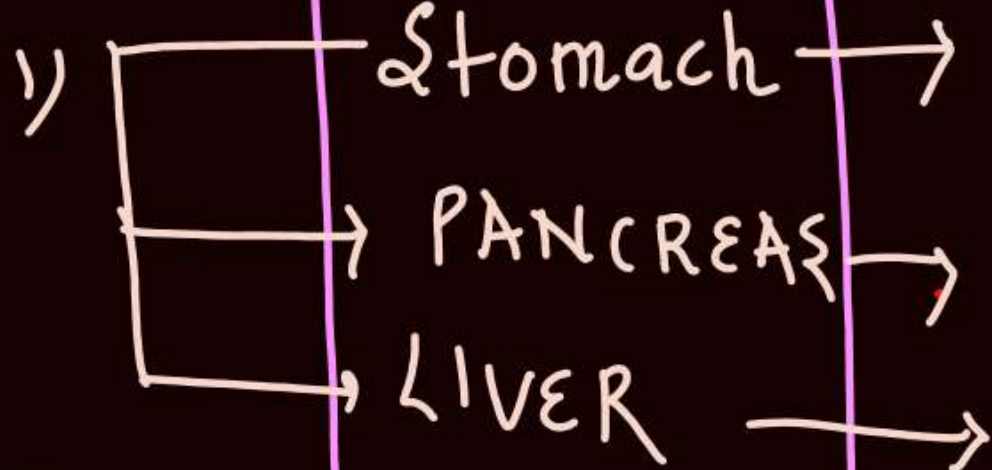



DIGESTION AND ABSORPTION- LECTURE -05





Imp.

	<u>HORMONE</u>	<u>SOURCE</u>	<u>TARGET</u>	<u>FUNCTION</u>
①	<u>GASTRIN</u>	Stomach	Stomach	
②	<u>ENTEROGASTRONE</u>	SI (Duodenum)	"	
③	<u>SECRETIN</u>	1) 		
④	<u>CCK-PZ</u>	2) 		

GI

The activities of the gastro-intestinal tract are under neural and hormonal control for proper coordination of different parts. The sight, smell and/or the presence of food in the oral cavity can stimulate the secretion of saliva. Gastric and intestinal secretions are also, similarly, stimulated by neural signals. The muscular activities of different parts of the alimentary canal can also be moderated by neural mechanisms, both local and through CNS. Hormonal control of the secretion of digestive juices is carried out by local hormones produced by the gastric and intestinal mucosa.



ABSORPTION

End product of Carb, Protein, N.A



Blood
Lymph

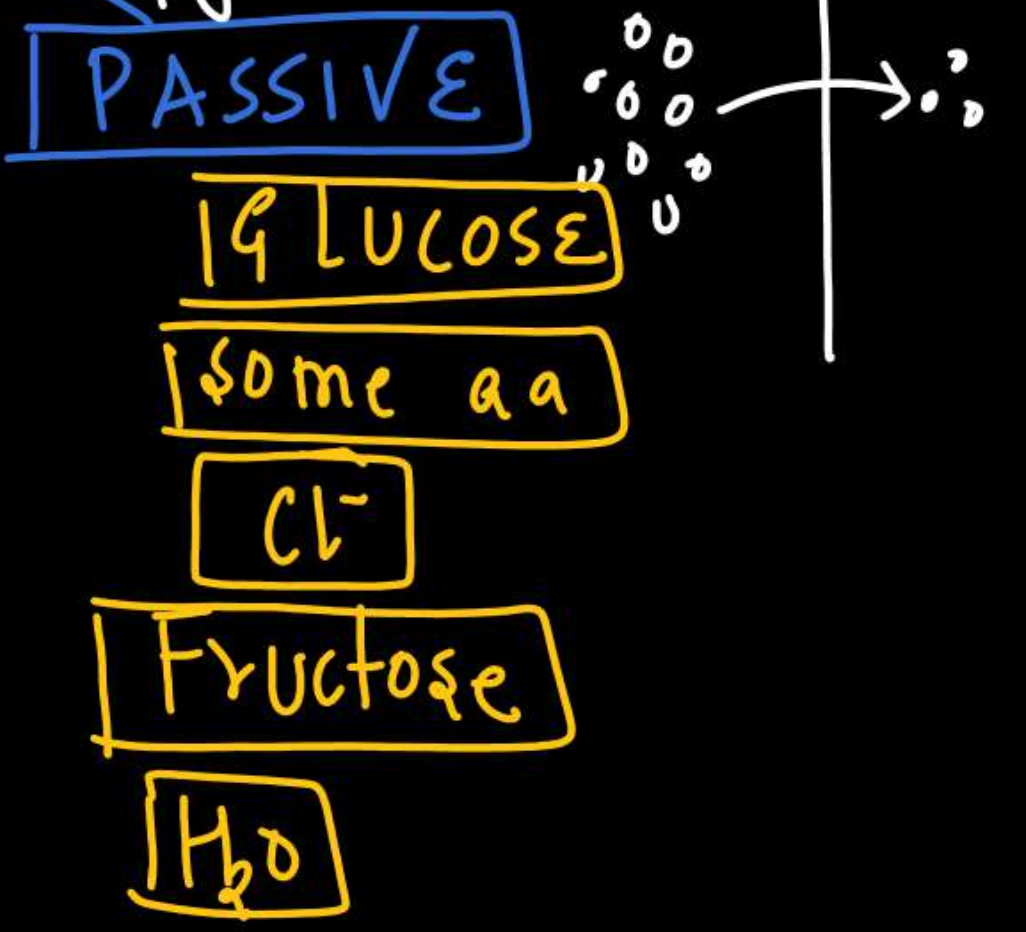
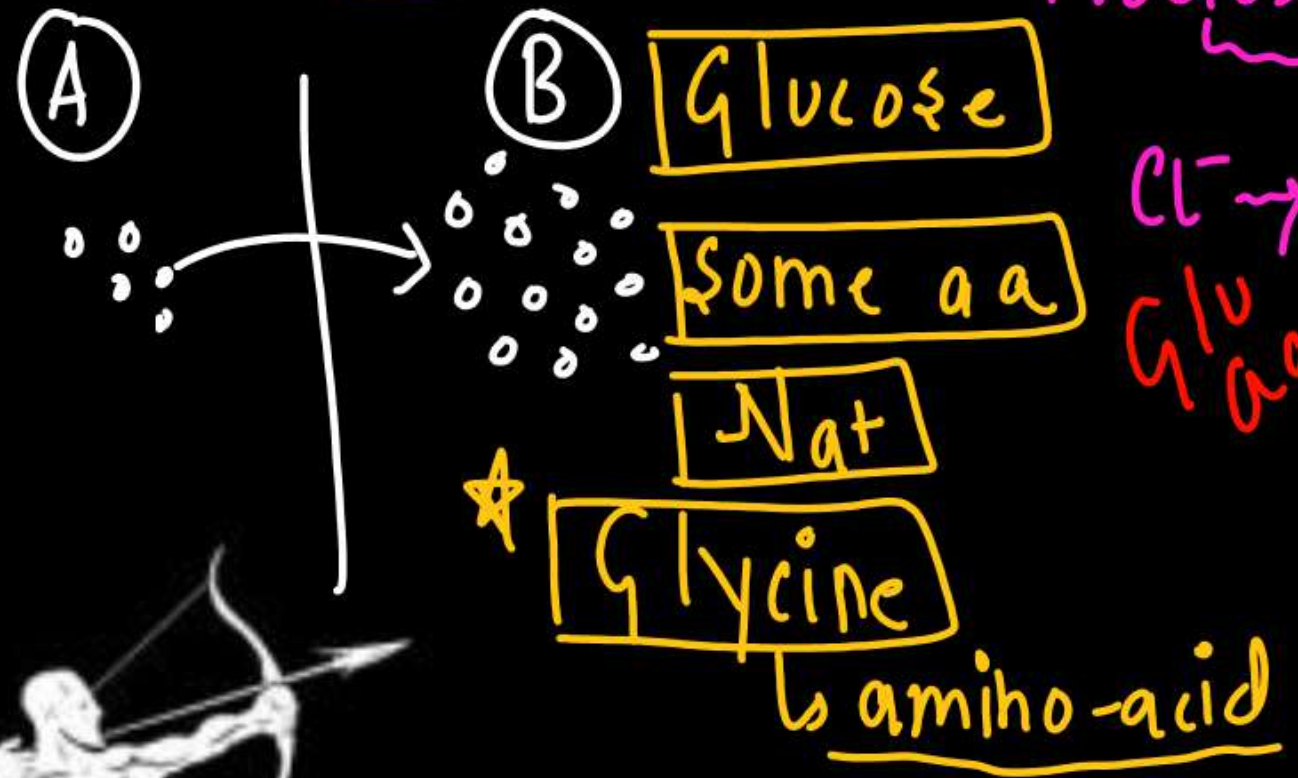
F.A, Glycerol

ABSORPTION

→ Use ATP
→ against the concentration gradient
ACTIVE

→ No ATP
→ towards the conc. gradient
PASSIVE

H₂O → osmosis
Fructose → Facilitated diffusion
Cl⁻ → Simple Diffusion



ABSORPTION



Absorption is the process by which the end products of digestion pass through the intestinal mucosa into the blood or lymph. It is carried out by passive, active or facilitated transport mechanisms. Small amounts of monosaccharides like glucose, amino acids and some electrolytes like chloride ions are generally absorbed by simple diffusion. The passage of these substances into the blood depends upon the concentration gradients. However, some substances like glucose and amino acids are absorbed with the help of carrier proteins. This mechanism is called the facilitated transport.

Transport of water depends upon the osmotic gradient. Active transport occurs against the concentration gradient and hence requires energy. Various nutrients like amino acids, monosaccharides like glucose, electrolytes like Na^+ are absorbed into the blood by this mechanism.

Fatty acids and glycerol being insoluble, cannot be absorbed into the

F.A, Glycerol

facilitated
→ *glu*
→ *aa*
→ *fructose*

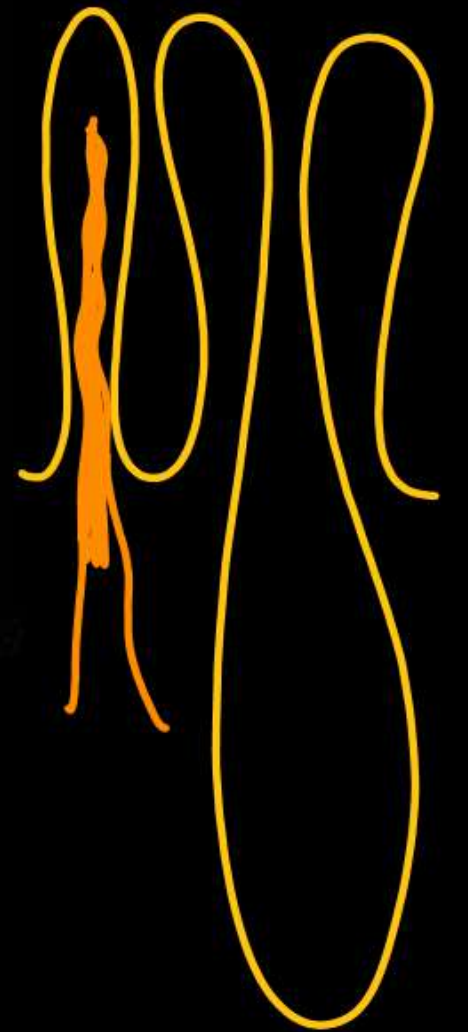


ABSORPTION

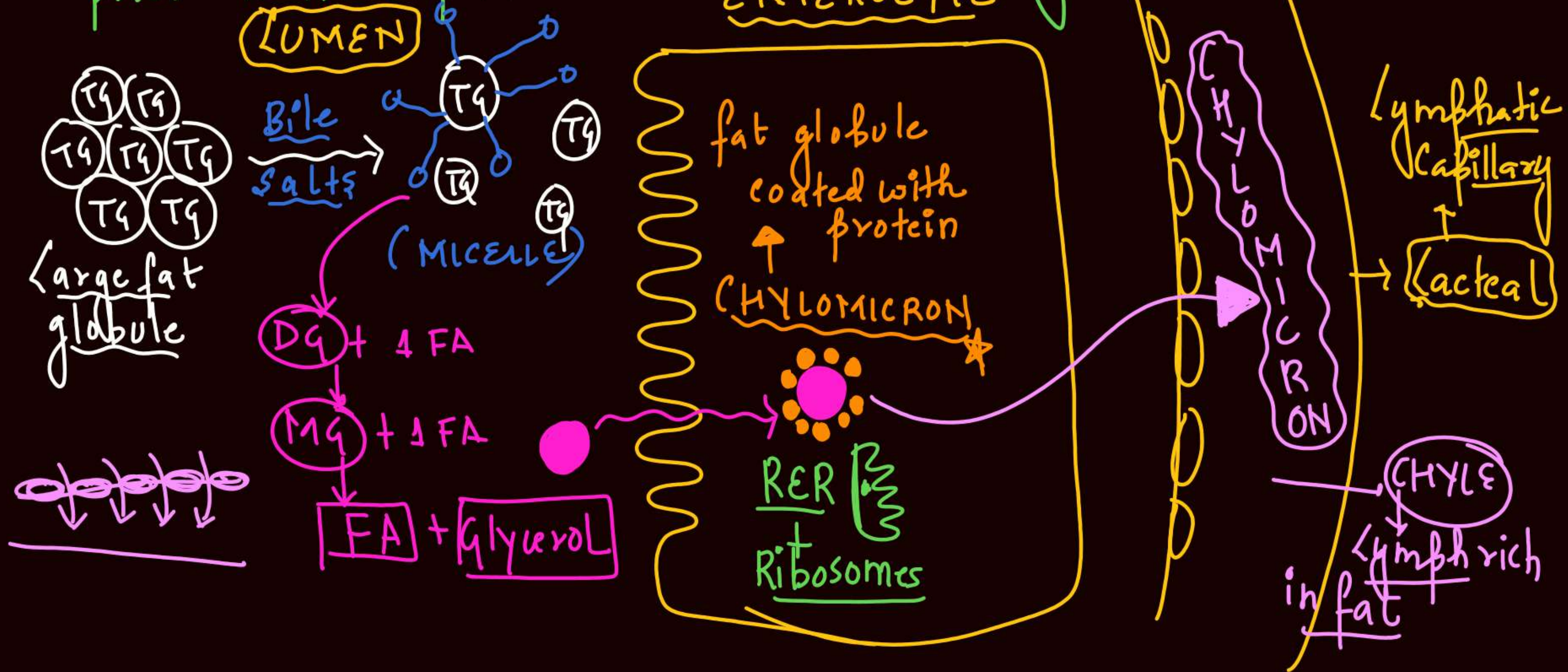


blood. They are first incorporated into small droplets called micelles which move into the intestinal mucosa. They are re-formed into very small protein coated fat globules called the chylomicrons which are transported into the lymph vessels (lacteals) in the villi. These lymph vessels ultimately release the absorbed substances into the blood stream.

Absorption of substances takes place in different parts of the alimentary canal, like mouth, stomach, small intestine and large intestine. ~~However~~, maximum absorption occurs in the small intestine. A summary of absorption (sites of absorption and substances absorbed) is given in Table 16.1.



Note: End product of Carbohydrate, protein, N.A does not undergo modification for **ABSORPTION** but F.A & Glycerol are modified prior to Absorption.



Important



TABLE 16.1 The Summary of Absorption in Different Parts of Digestive System

<u>Mouth</u>	<u>Stomach</u>	<u>Small Intestine</u>	<u>Large Intestine</u>
Certain <u>drugs</u> coming in contact with the <u>mucosa</u> of <u>mouth</u> and <u>lower side</u> of the <u>tongue</u> are absorbed into the <u>blood capillaries</u> lining them.	Absorption of <u>water</u> , <u>simple sugars</u> , and <u>alcohol</u> etc. takes place.	Principal organ for <u>absorption</u> of <u>nutrients</u> . The <u>digestion</u> is completed here and the <u>final products</u> of digestion such as <u>glucose</u> , <u>fructose</u> , <u>fatty acids</u> , <u>glycerol</u> and <u>amino acids</u> are absorbed through the <u>mucosa</u> into the <u>blood stream</u> and <u>lymph</u> .	(Absorption of <u>water</u> , <u>some minerals</u> and <u>drugs</u> takes place.



ASSIMILATION AND EGESTION

Utilisation of End product of Digestion by the cells / tissues to produce Energy

The voluntary removal of faecal matter by RELAXATION of INVOLUNTARY internal anal sphincter & VOLUNTARY RELAXATION OF EXTERNAL ANAL SPHINCTER.

ANUS → internal anal sphincter (involuntary)
external anal sphincter (voluntary)



Faecal Matter

→ Yellowish/Brownish Color

→ Smell is because of Microbial gas

→ STERCOBILIN

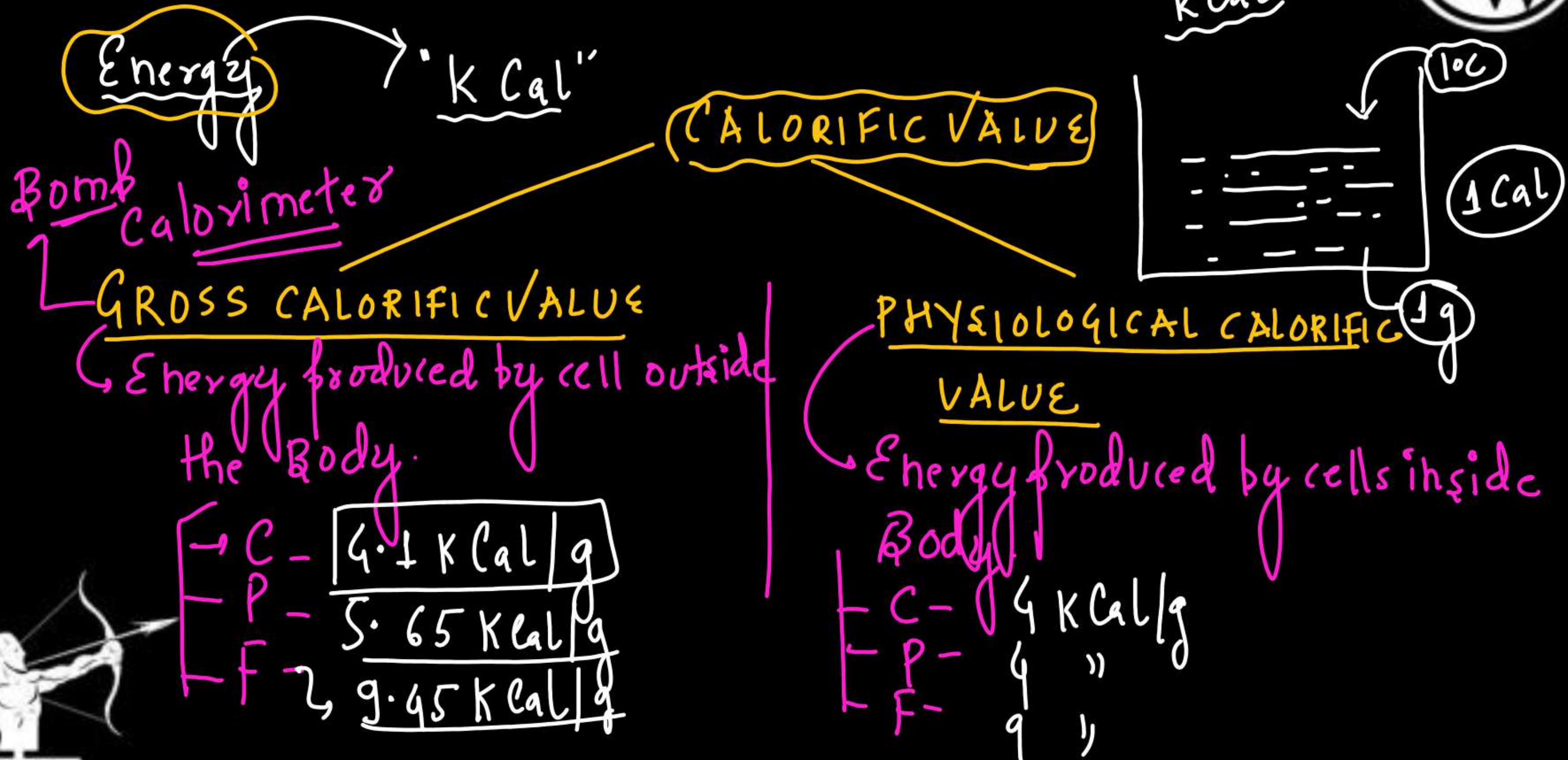
derivative of Bilirubin
↳ Biliverdin

→ SKATOLE

The absorbed substances finally reach the tissues which utilise them for their activities. This process is called assimilation.

The digestive wastes, solidified into coherent faeces in the rectum initiate a neural reflex causing an urge or desire for its removal. The egestion of faeces to the outside through the anal opening (defaecation) is a voluntary process and is carried out by a mass peristaltic movement.





CALORIFIC VALUE OF PROTEIN, CARBOHYDRATE AND FAT (Boxed item – Not for evaluation)

The energy requirements of animals, and the energy content of food, are expressed in terms of measure of heat energy because heat is the ultimate form of all energies. This is often measured to as calorie (cal) or joule (J), which is the amount of heat energy required to raise the temperature of 1 g of water by 1 °C. Since this value is tiny amount of energy, physiologists commonly use kilocalorie (kcal) or kilo joule (kJ). One kilo calorie is the amount of energy required to raise the temperature of 1 kg of water by 1 °C. Nutritionists, traditionally refer to kcal as the Calorie or Joule (always capitalised). (The amount of heat liberated from complete combustion of 1 g food in a bomb calorimeter (a closed metal chamber filled with O₂) is its gross calorific or gross energy value.) The actual amount of energy combustion of 1 g of food is the physiologic value of food. Gross calorific values of carbohydrates, proteins and fats are 4.1 kcal/g, 5.65 kcal/g and 9.45 kcal/g, respectively, whereas their physiologic values are 4.0 kcal/g, 4.0 kcal/g and 9.0 kcal/g, respectively.

