

# UPDAAN



## 2025

#Ch

## LIFE PROCESSES

Biology

Lecture - 04

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# Topics to be covered

- 1 Nutrition in human beings ✓
- 2 MCQ practice and Homework ✓





Example of a parasite -

# HQ

(A) Human being

☒ (B) Tape Worm

(C) Yeast

(D) Mushroom



## Question of the Day



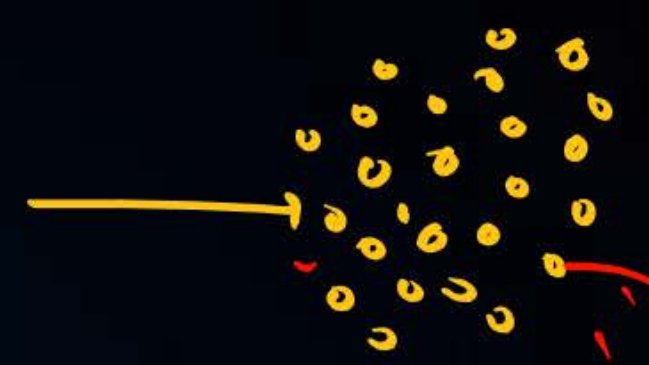
Total length of human small intestine :

5-7 m

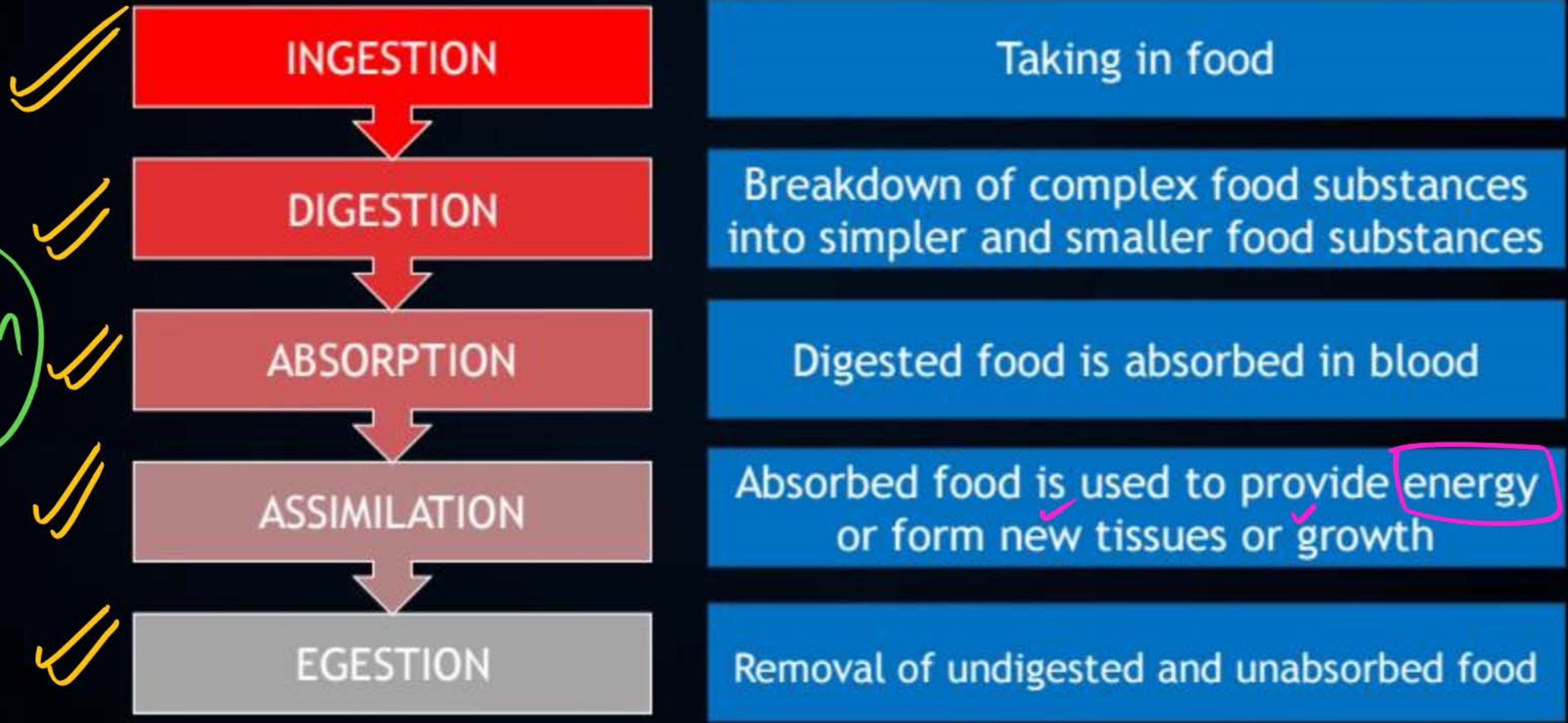




# Steps of Holozoic Nutrition



#Ch

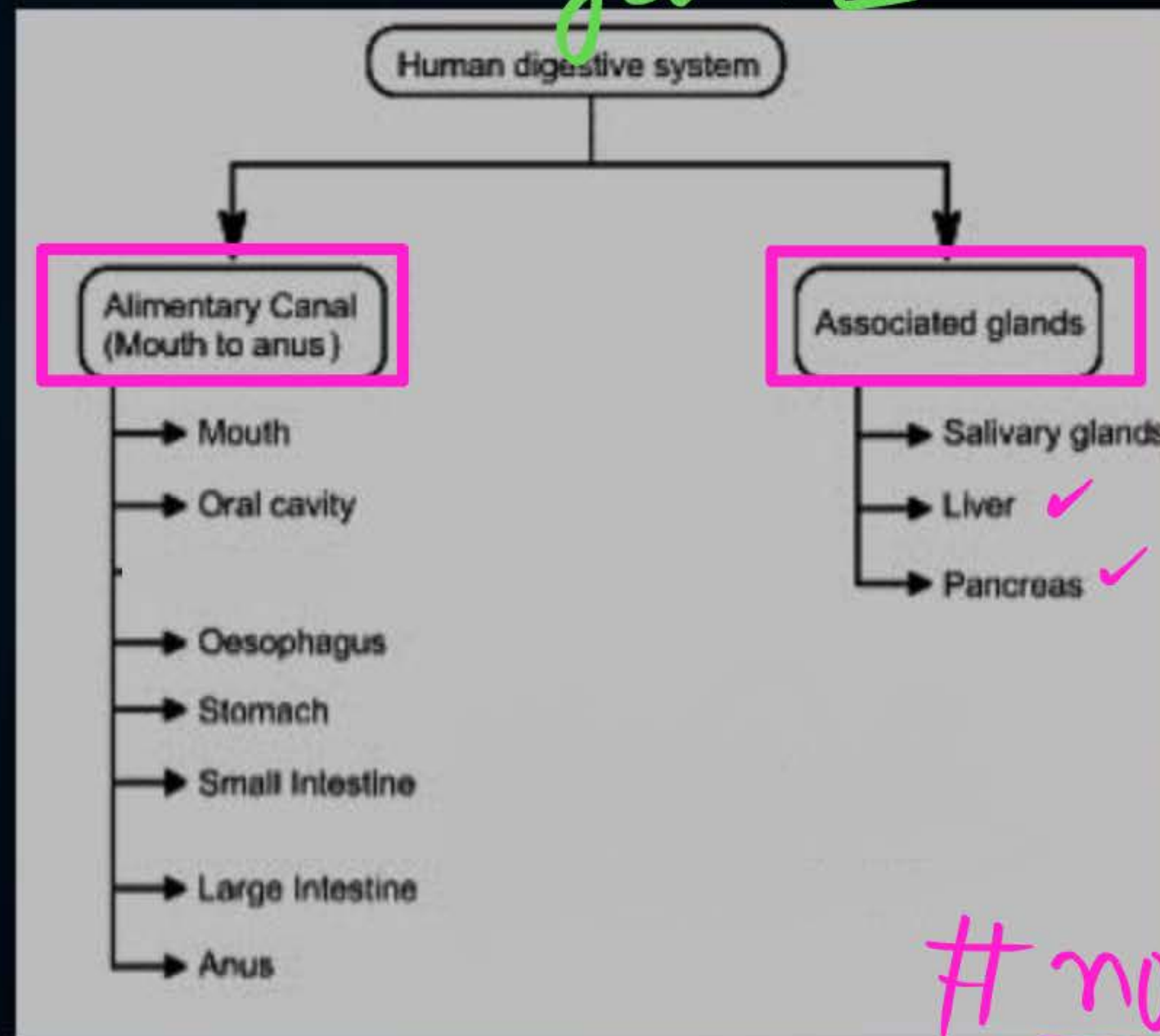
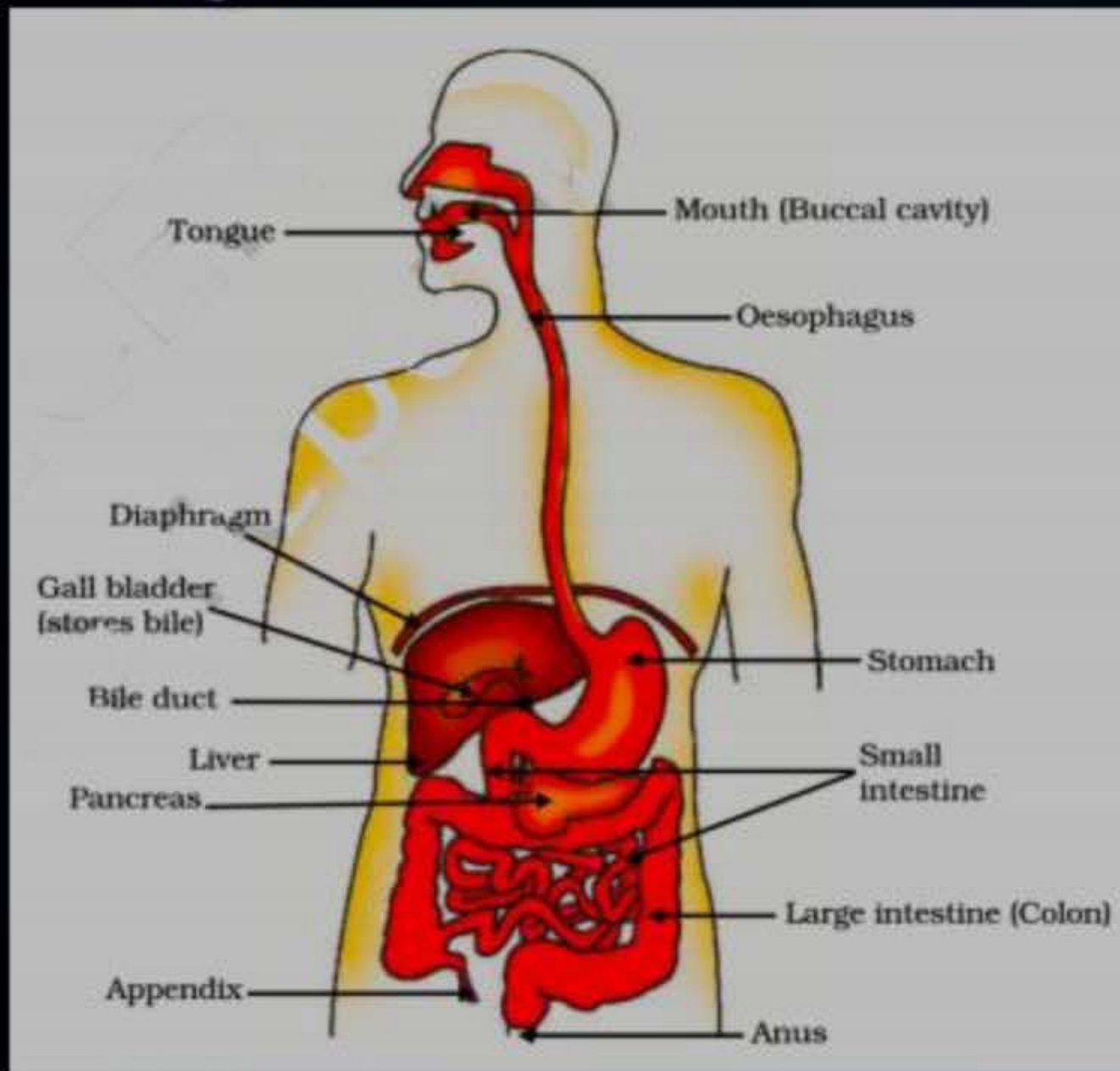


Blood



# Nutrition in human beings

## Human Digestive System.

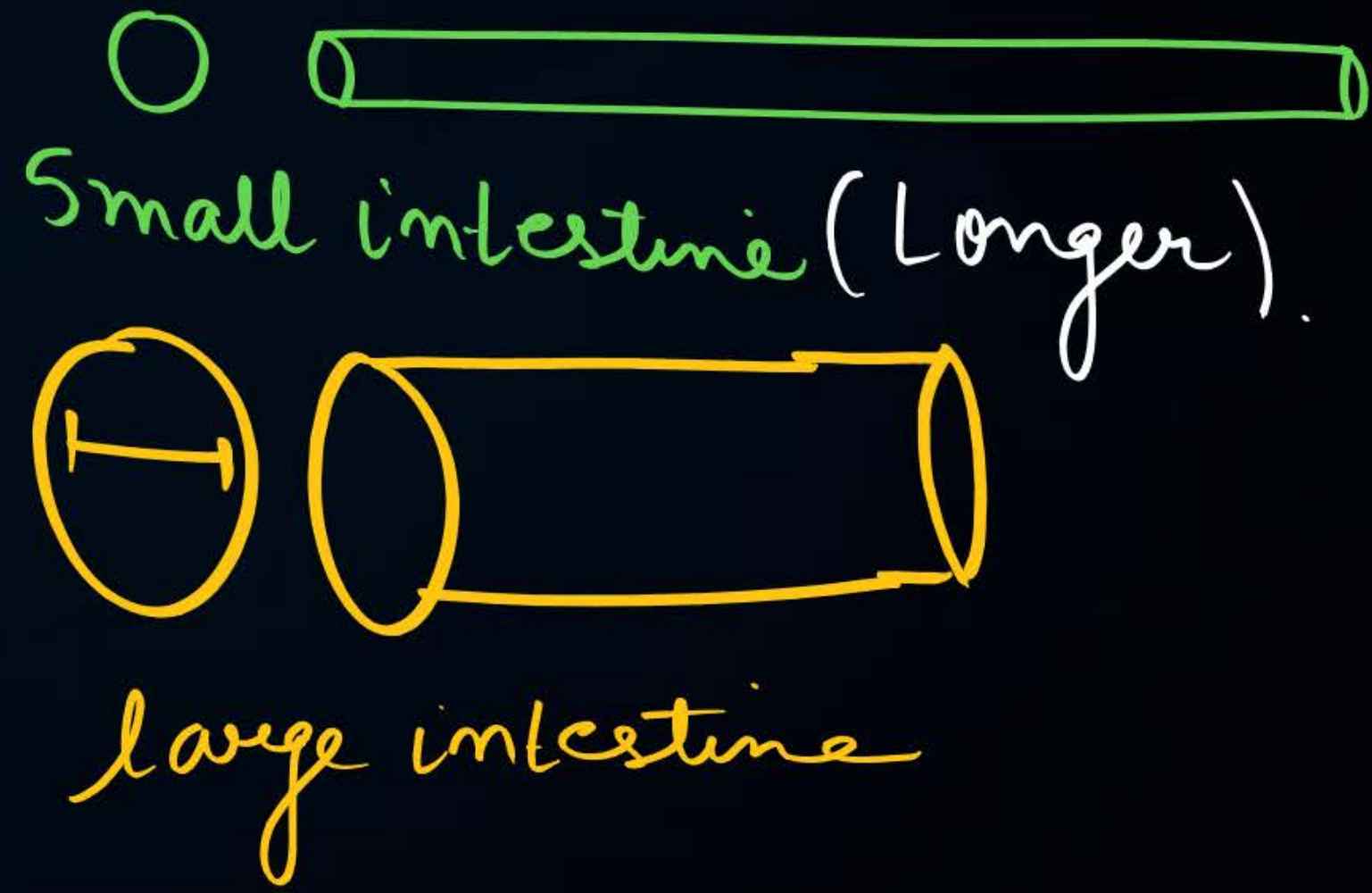
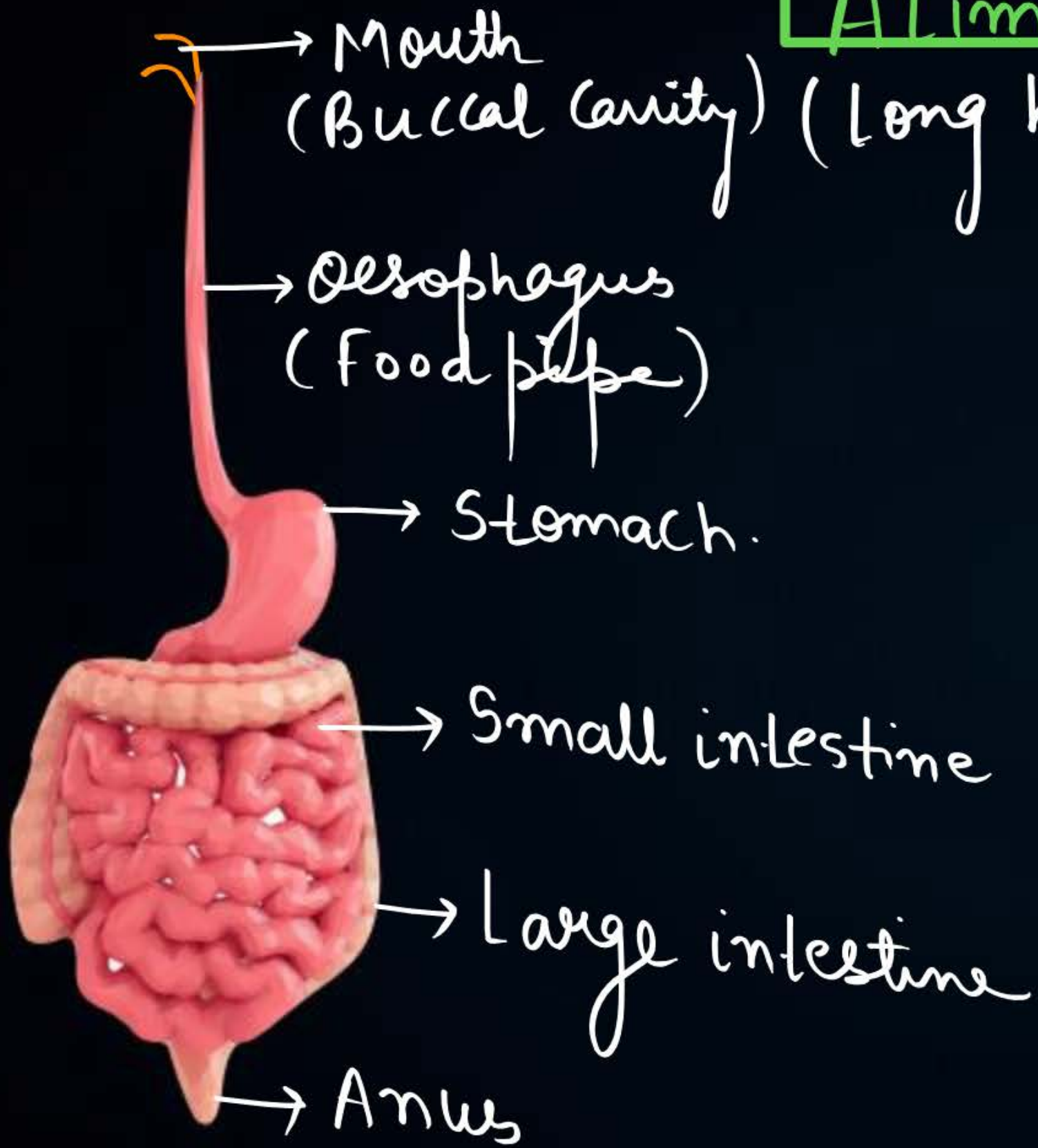


# notes



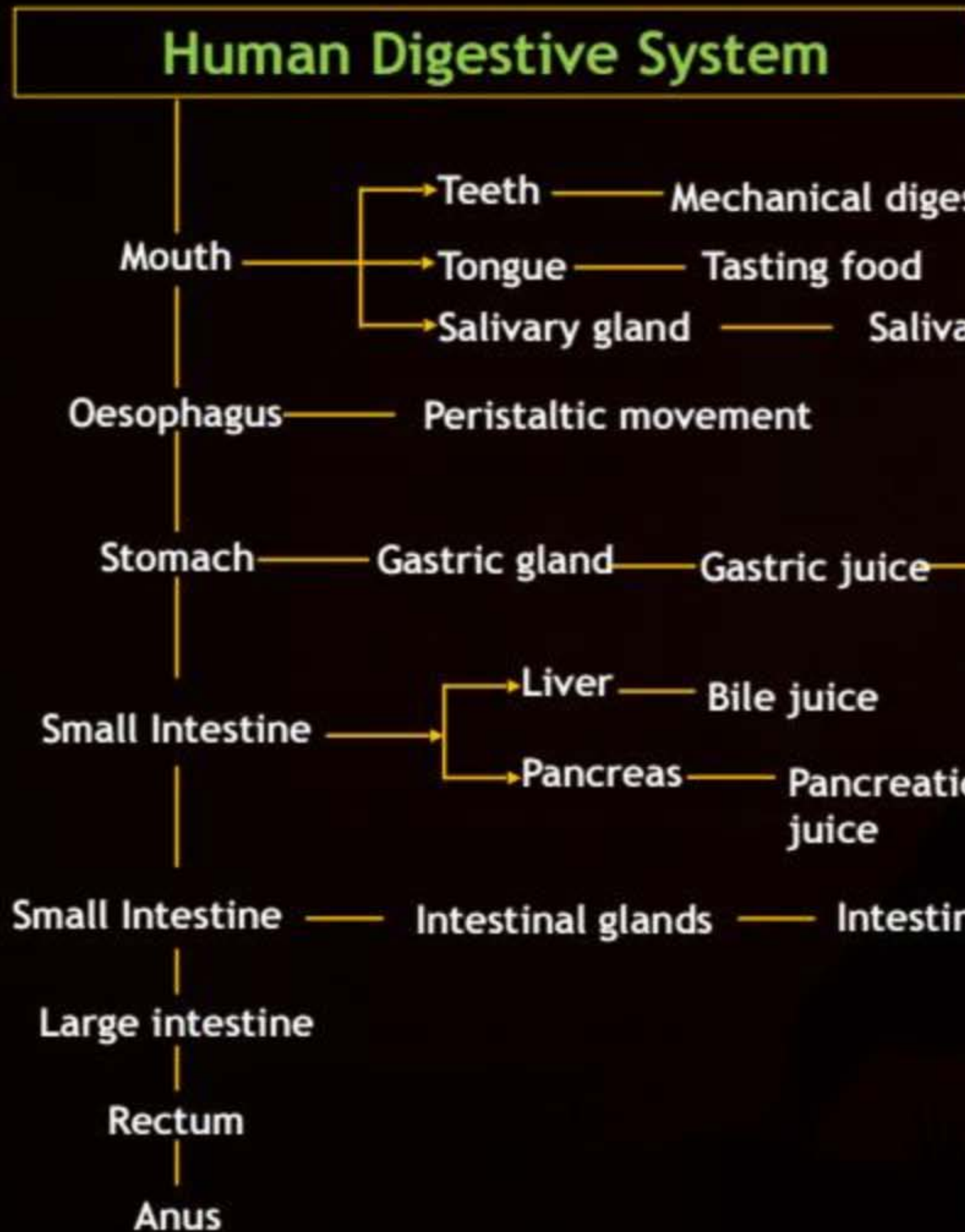
# Alimentary Canal

(Long hollow tube in which food moves during the process of nutrition).





# # notes





# # notes



Mouth (Buccal/oral cavity)	<ul style="list-style-type: none"><li>• Teeth</li><li>• Tongue</li><li>• Salivary gland</li></ul>	<ul style="list-style-type: none"><li>• Chewing and crushing of food,</li><li>• Rolling , tasting &amp; Swallowing of food,</li><li>• salivary amylase (Converts starch into maltose)</li></ul>
Oesophagus/ Food pipe	<b>Peristaltic movement</b> <b>(Contraction and relaxation of muscles )</b> pushes food towards stomach	Passage of food from mouth to stomach
Stomach	<u>Gastric juice</u> <ul style="list-style-type: none"><li>• Pepsin</li><li>• Hydrochloric acid</li><li>• Mucus</li></ul>	<ul style="list-style-type: none"><li>• Pepsin help in Breakdown of protein</li><li>• HCl provides acidic medium</li><li>• HCl kill bacteria and other germs in food.</li><li>• Protects inner lining of stomach.</li></ul>

# # notes



<b>Liver</b>	<i>Liver - Bile juice (stored in gall bladder)</i>	<u>Bile Juice :</u> <ul style="list-style-type: none"><li>• Emulsification of fats</li><li>• Makes food alkaline</li></ul>
<b>Pancreas</b>	<i>Pancreas- Pancreatic juice</i>	<u>Pancreatic Juice</u> <ul style="list-style-type: none"><li>• Amylase helps in digestion of carbohydrates</li><li>• Trypsin helps in digestion of protein</li><li>• Lipase helps in digestion of emulsified fats</li></ul>
<b>Small intestine</b> <ul style="list-style-type: none"><li>• Intestinal glands secrete intestinal juices.</li></ul>	<i>Intestinal Juice</i>  <i>Villi (Finger like projections in supplied with blood vessels)</i>	<u>Intestinal Juice</u> <ul style="list-style-type: none"><li>• Final digestion of fats</li></ul> <u>Villi</u> <ul style="list-style-type: none"><li>• Helps in absorption of digested food by increasing surface area.</li></ul>



# # notes



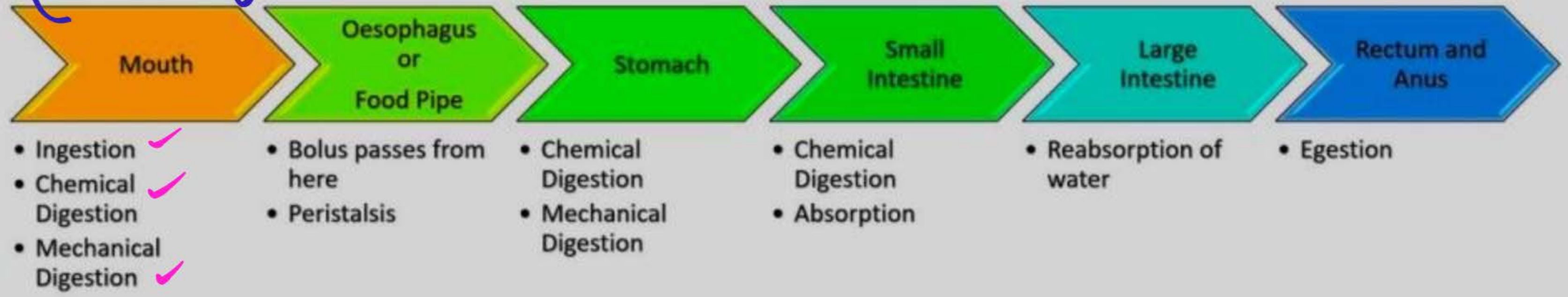
Large intestine (Colon)	Absorption of water
Rectum	Temporary collection of waste
Anus	Helps in Egestion (Removal of undigested and Unabsorbed food)

oral  
Cavity  
or



Buccal  
Cavity

# Steps In Human Nutrition





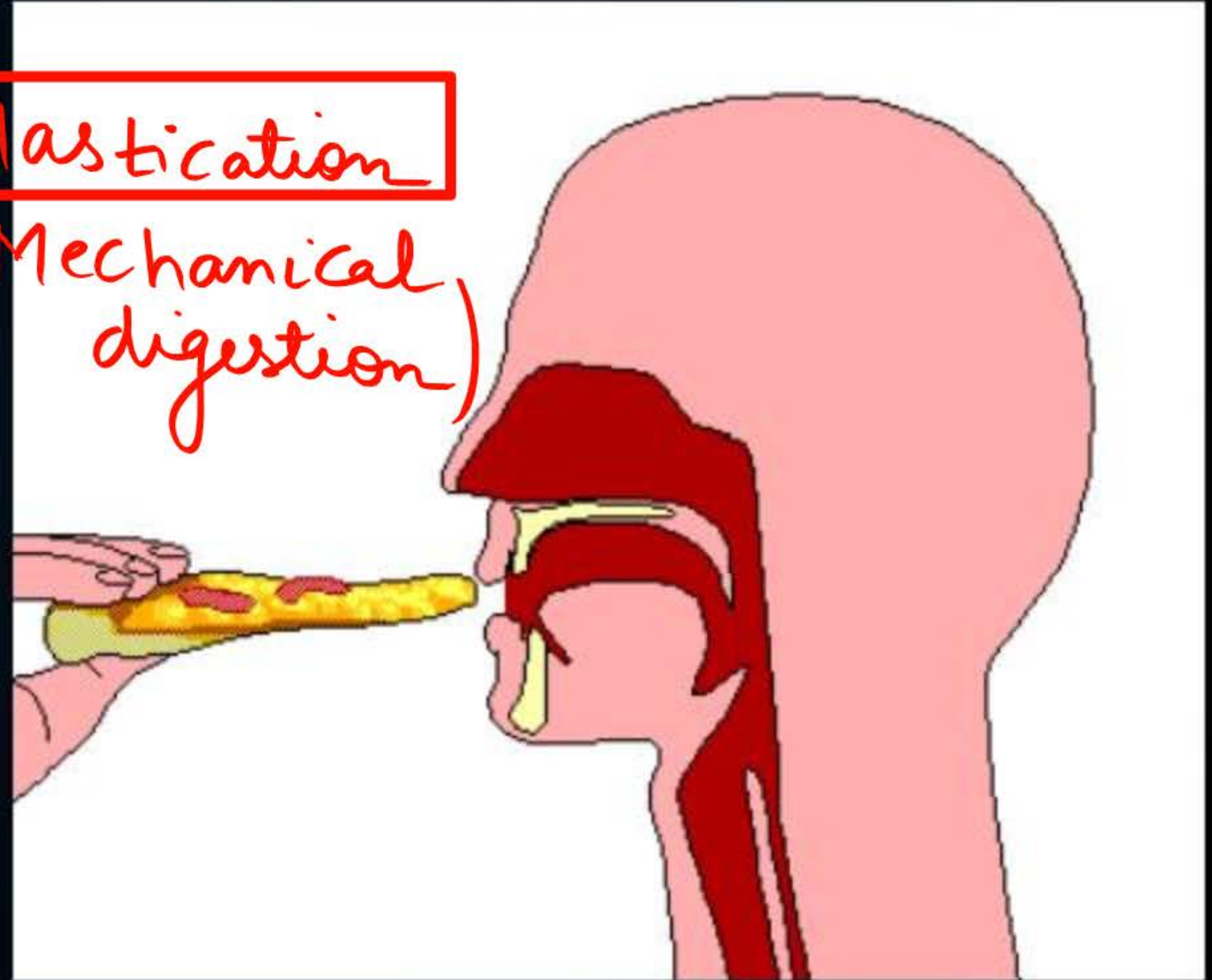
# Mouth(Buccal cavity)



- Food is ingested
- Crushed and chewed with the help of teeth
- Food is wetted with saliva to make its passage smooth
- Food is mixed with saliva with the help of muscular tongue.

→ Tasting of food  
(Gustatory Receptor).

Mastication  
(Mechanical digestion)







→ Saliva

Wow!  
Tasty food





Mouth → Salivary glands

Saliva (fluid)

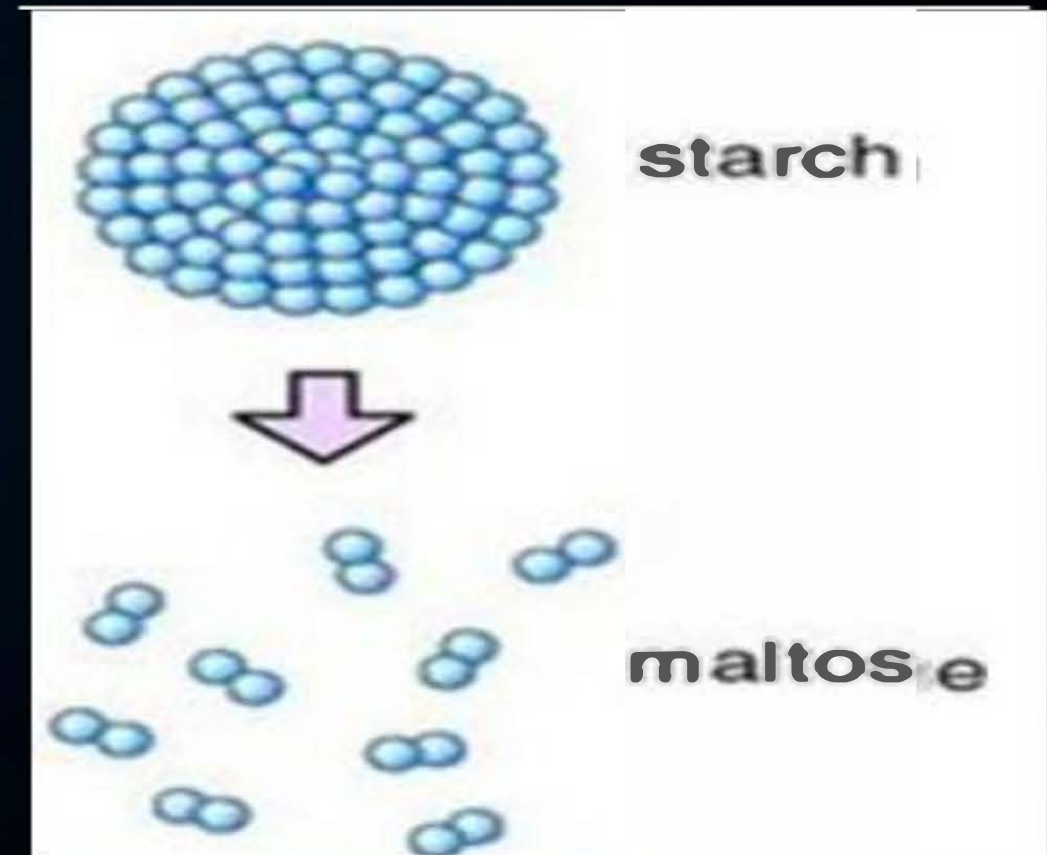
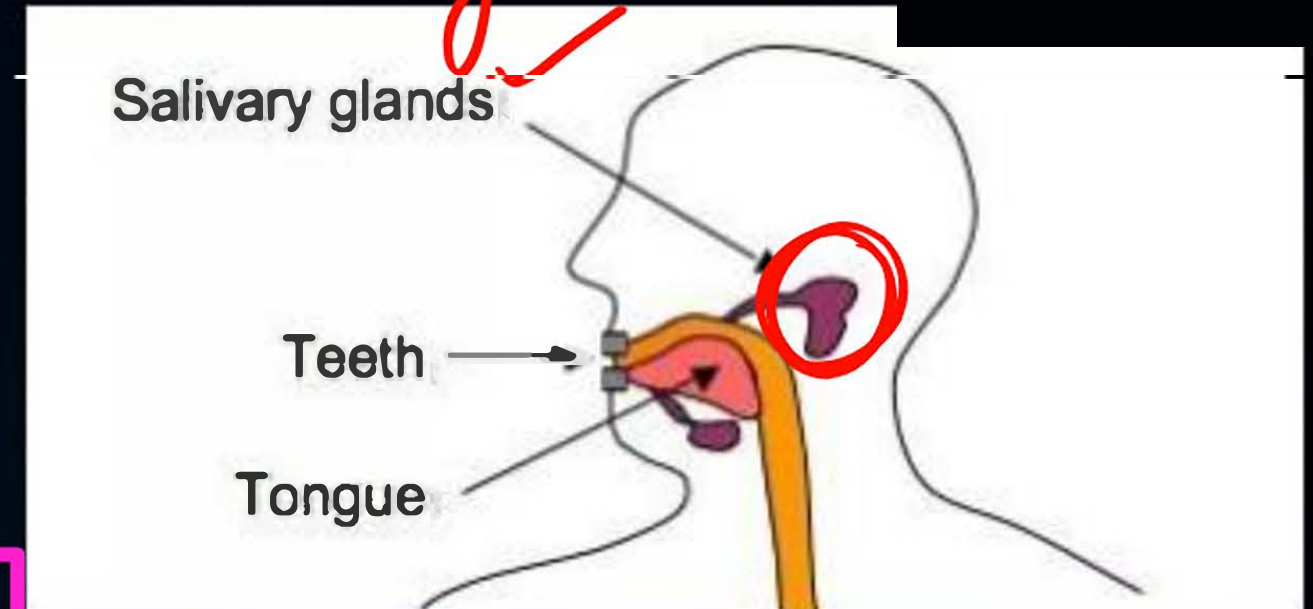
Salivary (Ptyalin)  
amylase

Starch  
(Complex  
Sugar)

Maltose

(Simple Sugar)

Chemical digestion





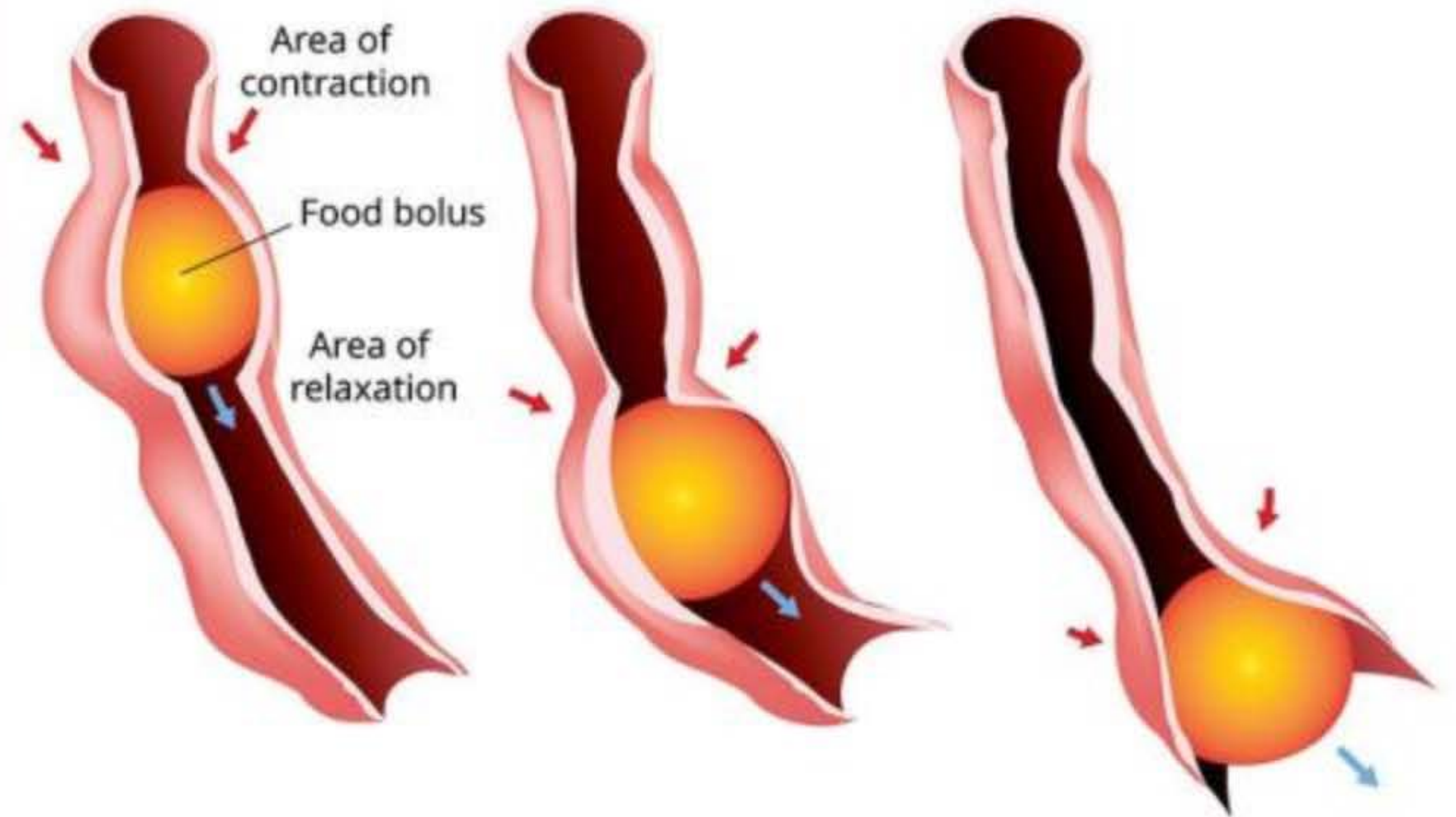
# Oesophagus (Food pipe)



- Food is pushed downwards due to rhythmic contraction and relaxation of muscles and is known as Peristalsis/ peristaltic movements.

(Involuntary Movements)

## PERISTALSIS



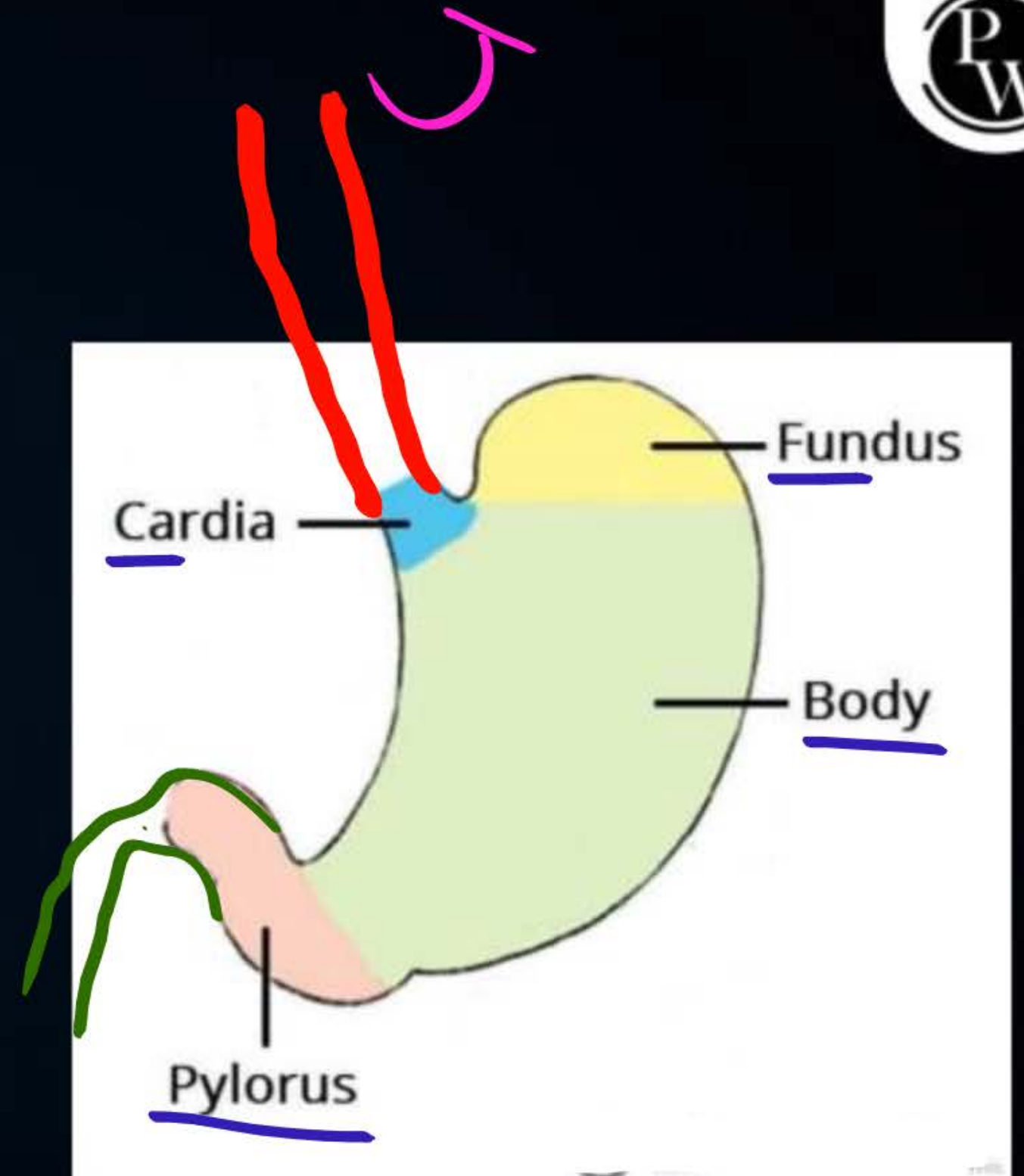




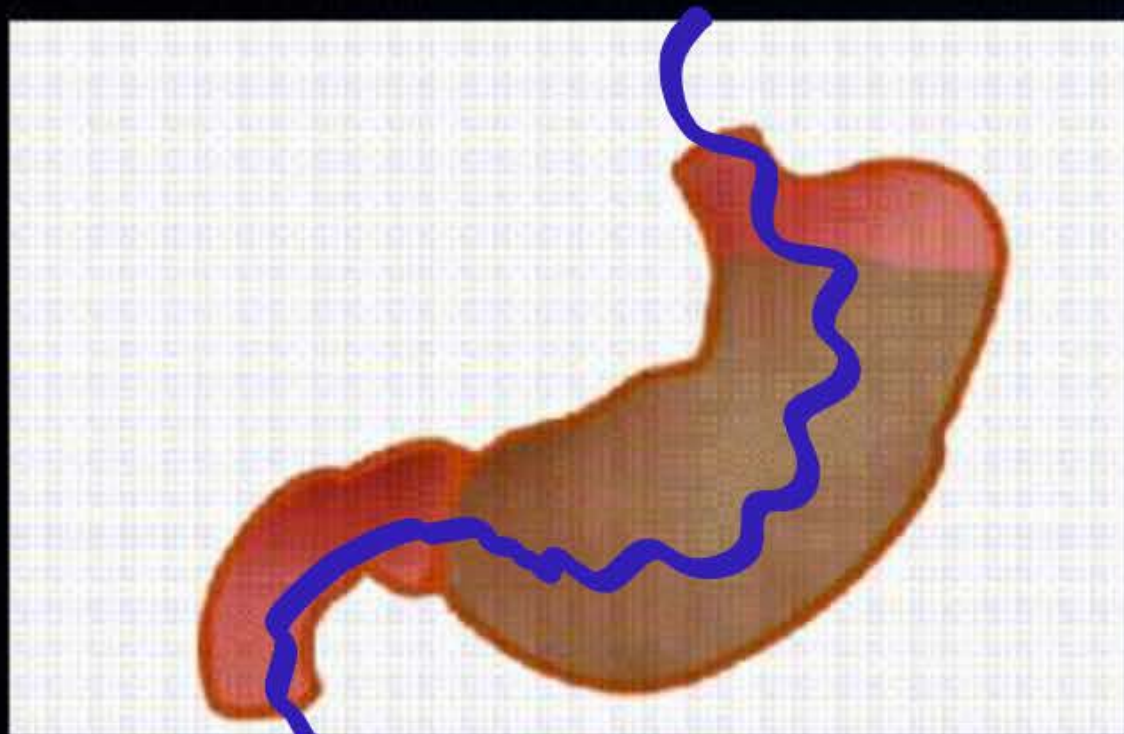
# Stomach



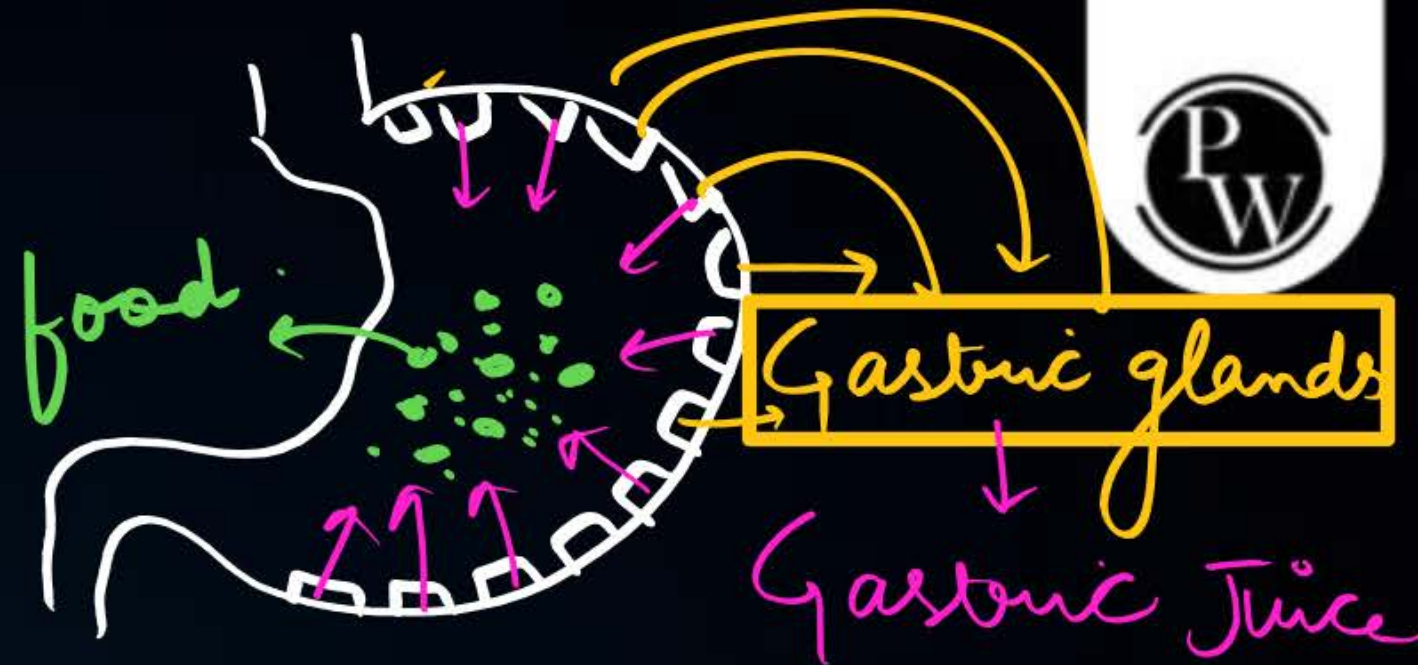
- Stomach is a large J-shaped organ which expand when food enters.
- ✓ Widest part of alimentary canal.
- ✓ 1. Mechanical digestion
- ✓ 2. chemical digestion



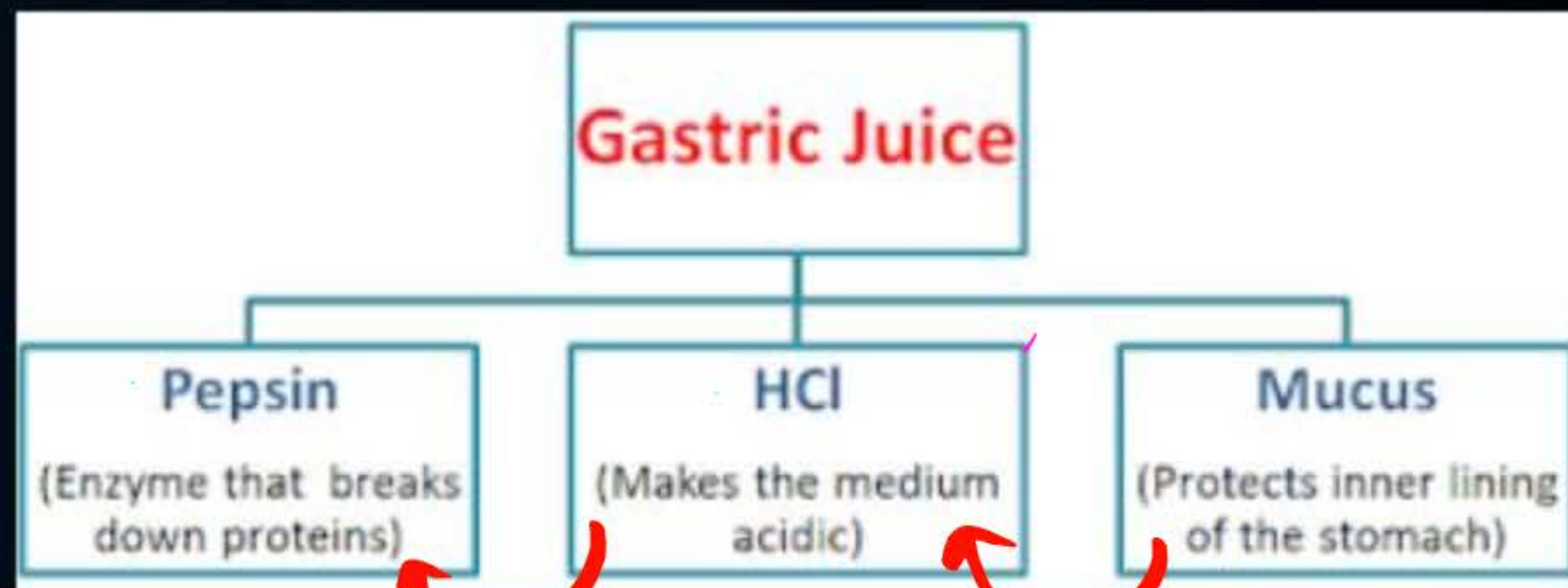




Chemical digestion



Churning of the food  
(Mechanical digestion)



• Kill germs

# Excessive amount  
of HCL released  
by stomach



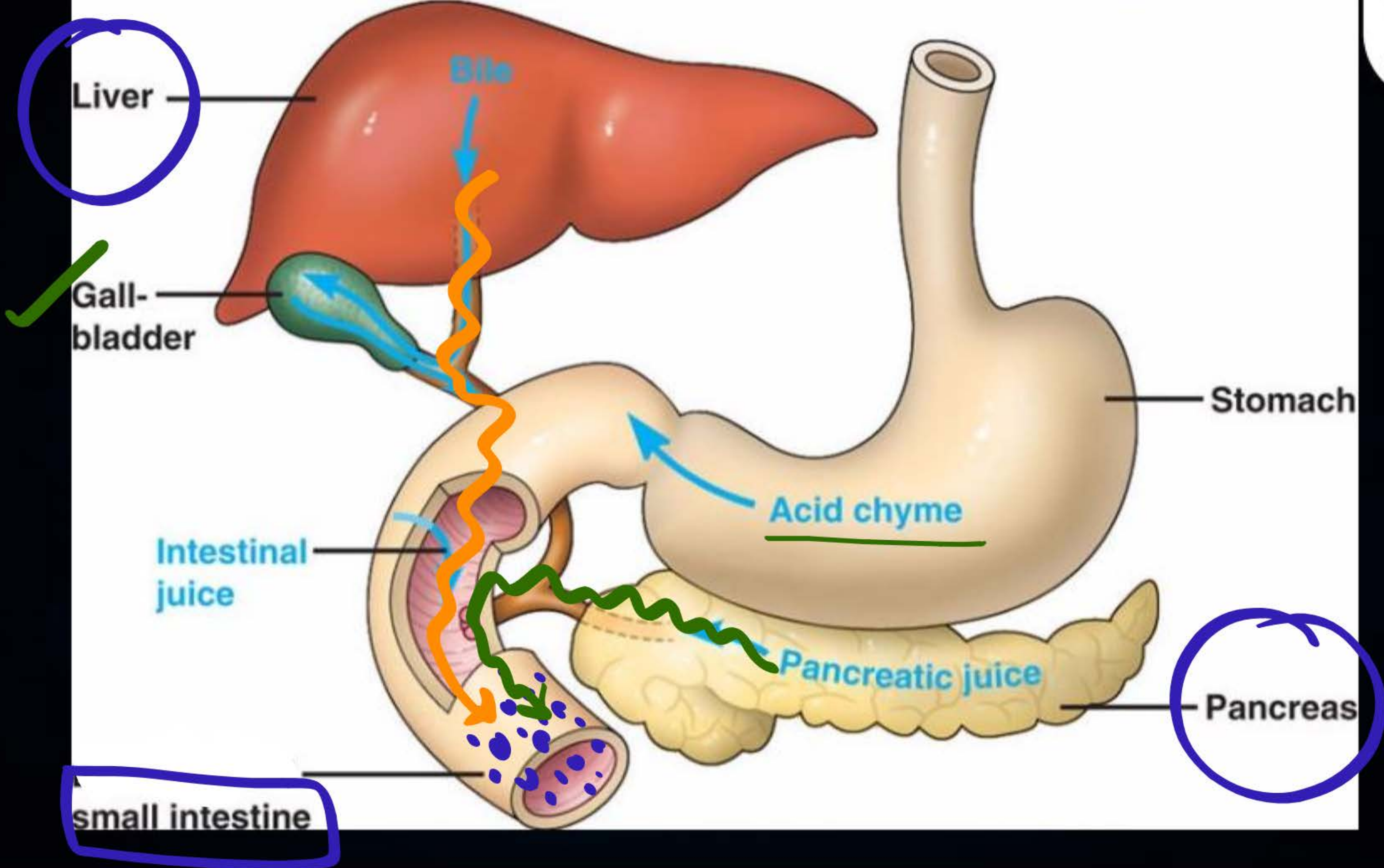
"Acidity"



Base

Alkaline



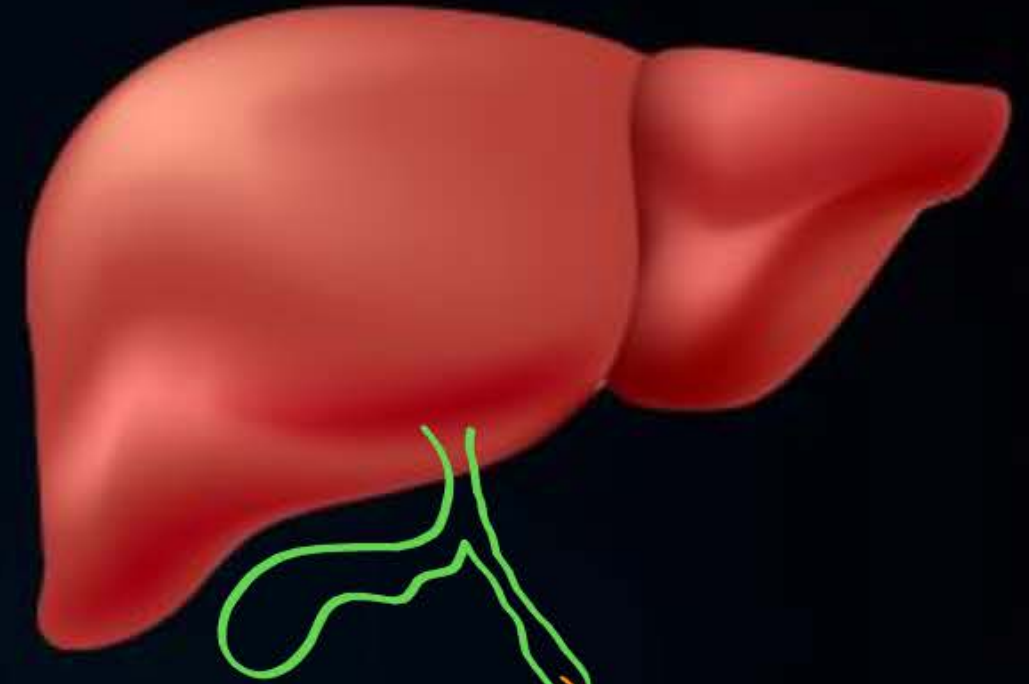


# Liver

→ largest gland in human body



- Secretes **Bile juice.**
- Bile juice is stored in gall bladder
- ✓ Bile juice makes food alkaline. ✓
- ✓ Bile juice helps in emulsification of fats.

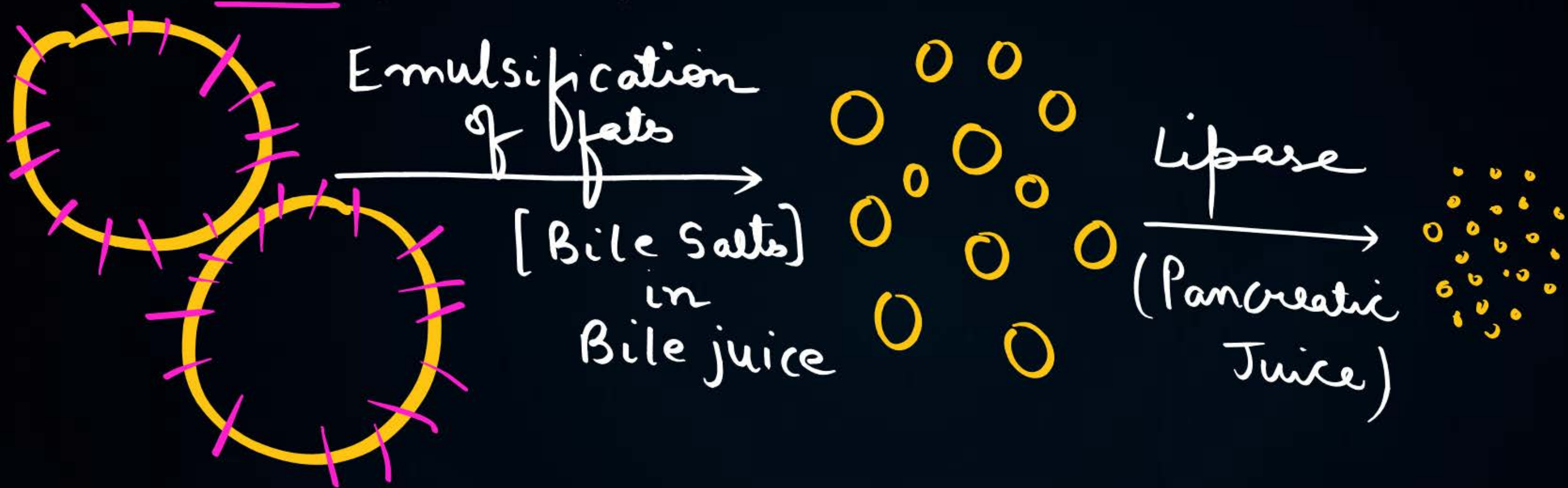


Small intestine



## Emulsification of fat

The process of breaking down the complex fat molecules into smaller fat molecules by the action of bile salts present in bile juice. ✓



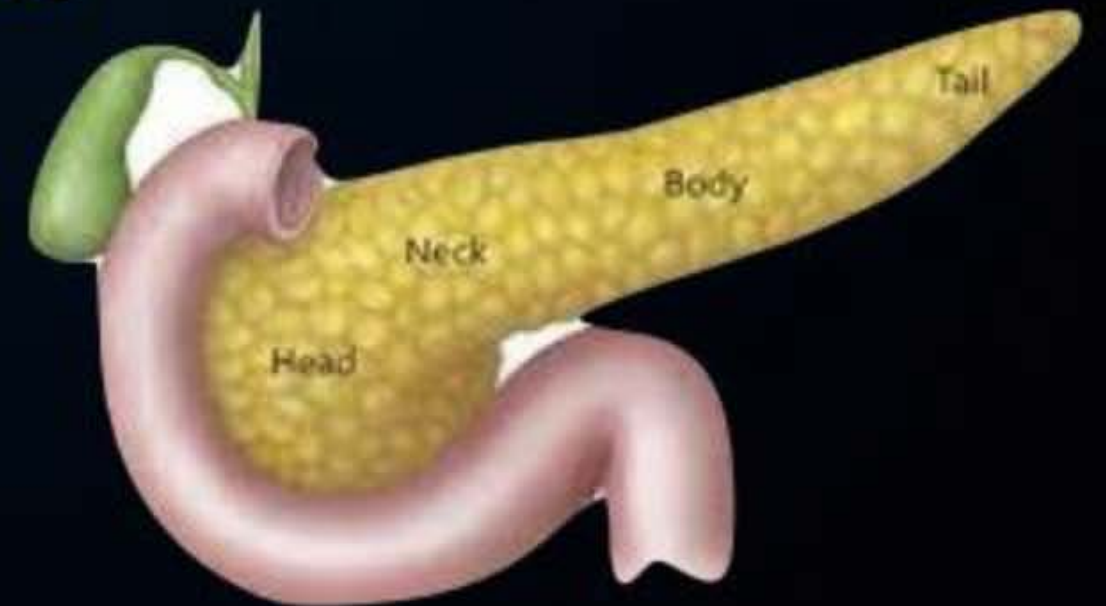
## Significance of Emulsification of fat

The efficiency of fat-digesting enzymes increases.

# Pancreas

secretes pancreatic juice which contains enzymes like :

1. **Trypsin** - helps in digestion of proteins.
2. **Lipase** : helps in breaking down of emulsified fats.
3. **Pancreatic amylase**: helps in digestion of carbohydrates





# Small intestine

→ duodenum  
→ Jejunum  
→ Ileum

- 5-7 meters long
- Site of final digestion and abosrption of food
- Secretes intestinal juice (Succus entericus)

Blood

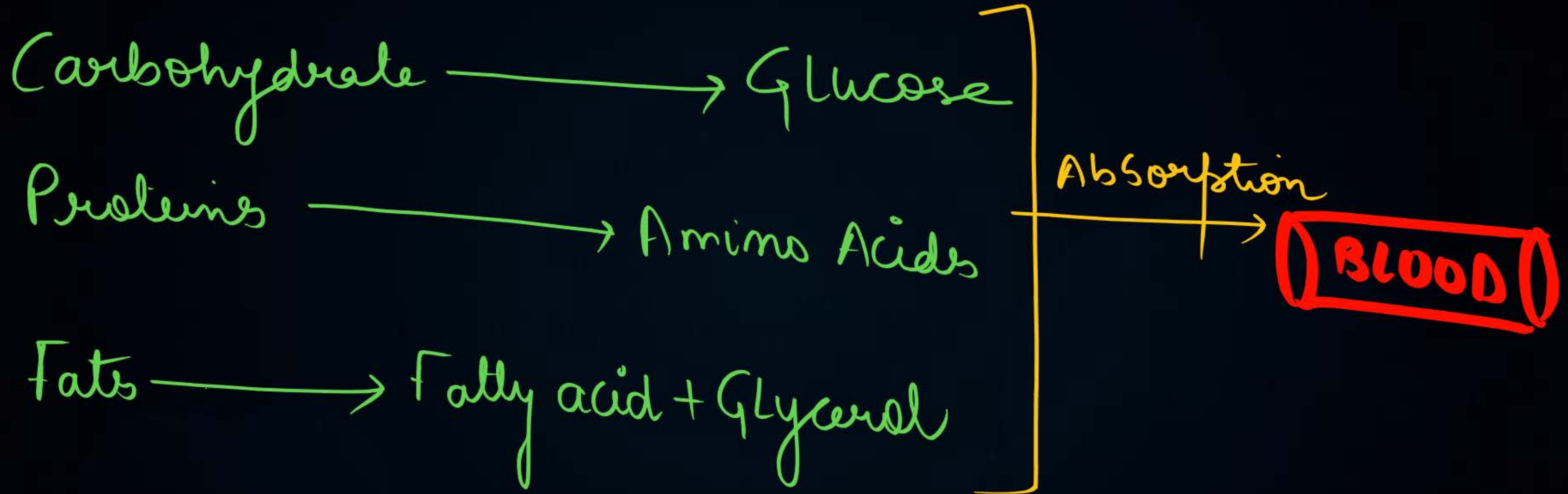


Enterocytes

→ Succus entericus (Intestinal Juice)

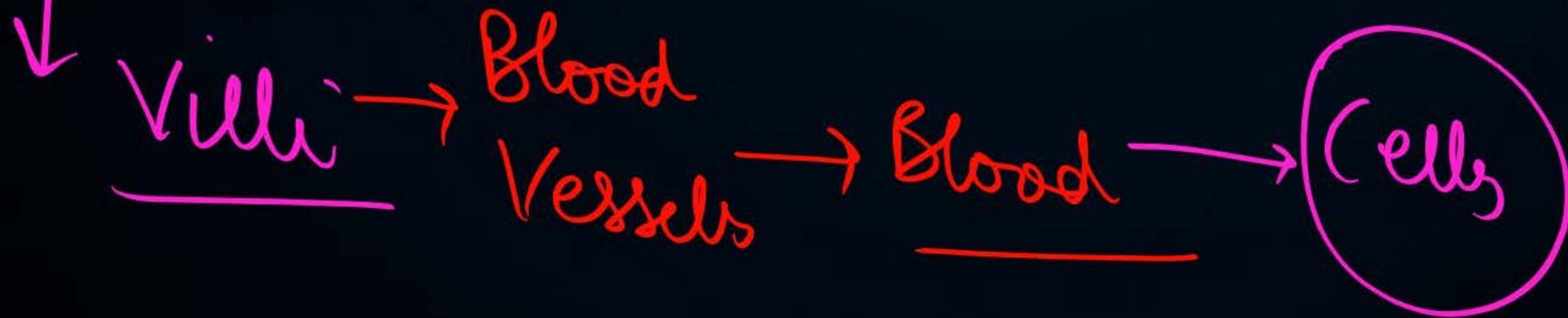
→ digestion of food

# # Final digestion of food in Small intestine





# Absorption of food



# Villi

- Villi are finger-like projections
- Increases the surface area for absorption.
- Richly supplied with blood vessels which take the absorbed food to each and every cell of the body,
- Food is utilised for obtaining energy, building up new tissues and the repair of old tissues.



Unabsorbed food is sent into the large intestine

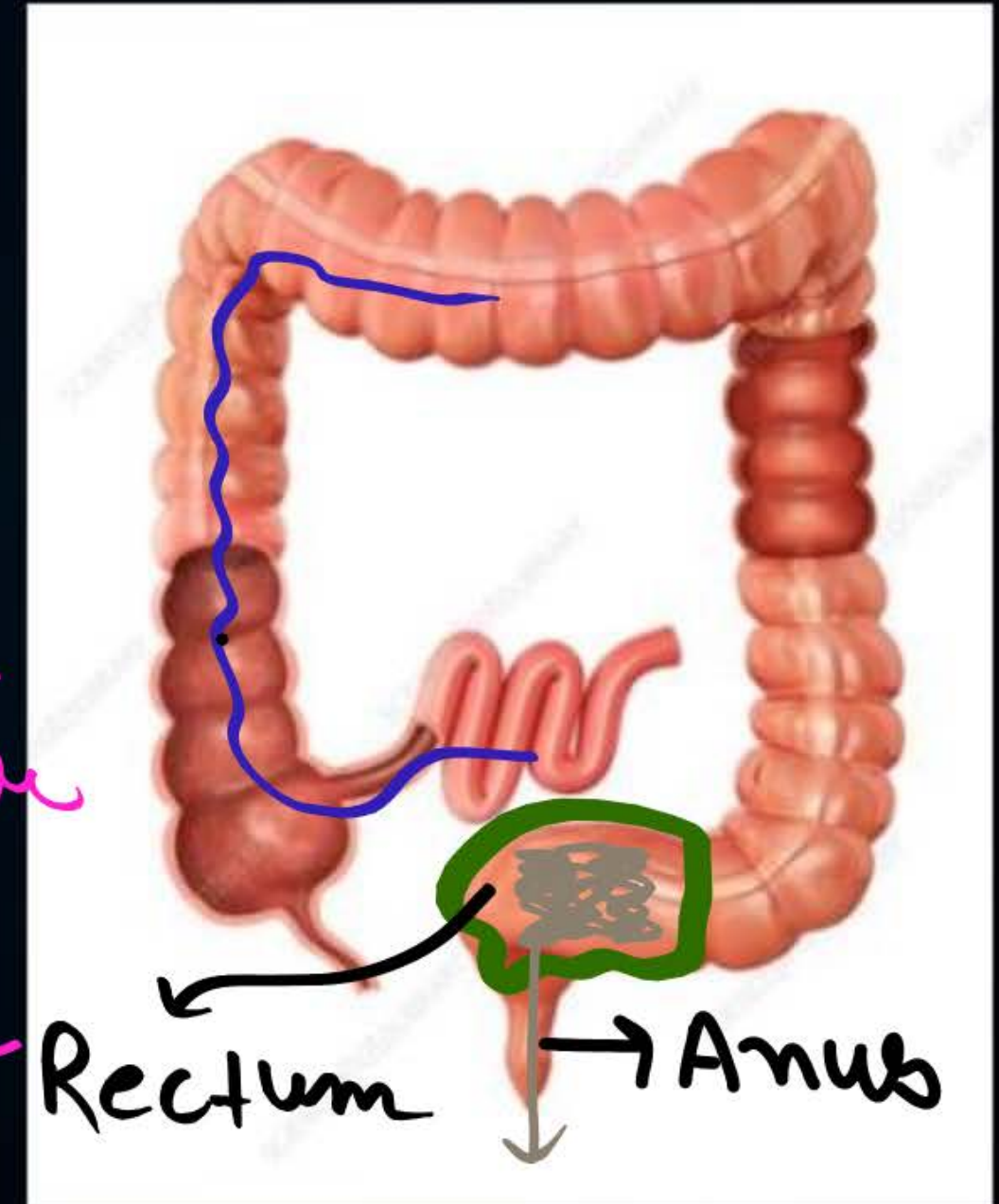


## Large intestine (Colon)

Absorption of Water

Anus → Egestion

Storage of faecal matter

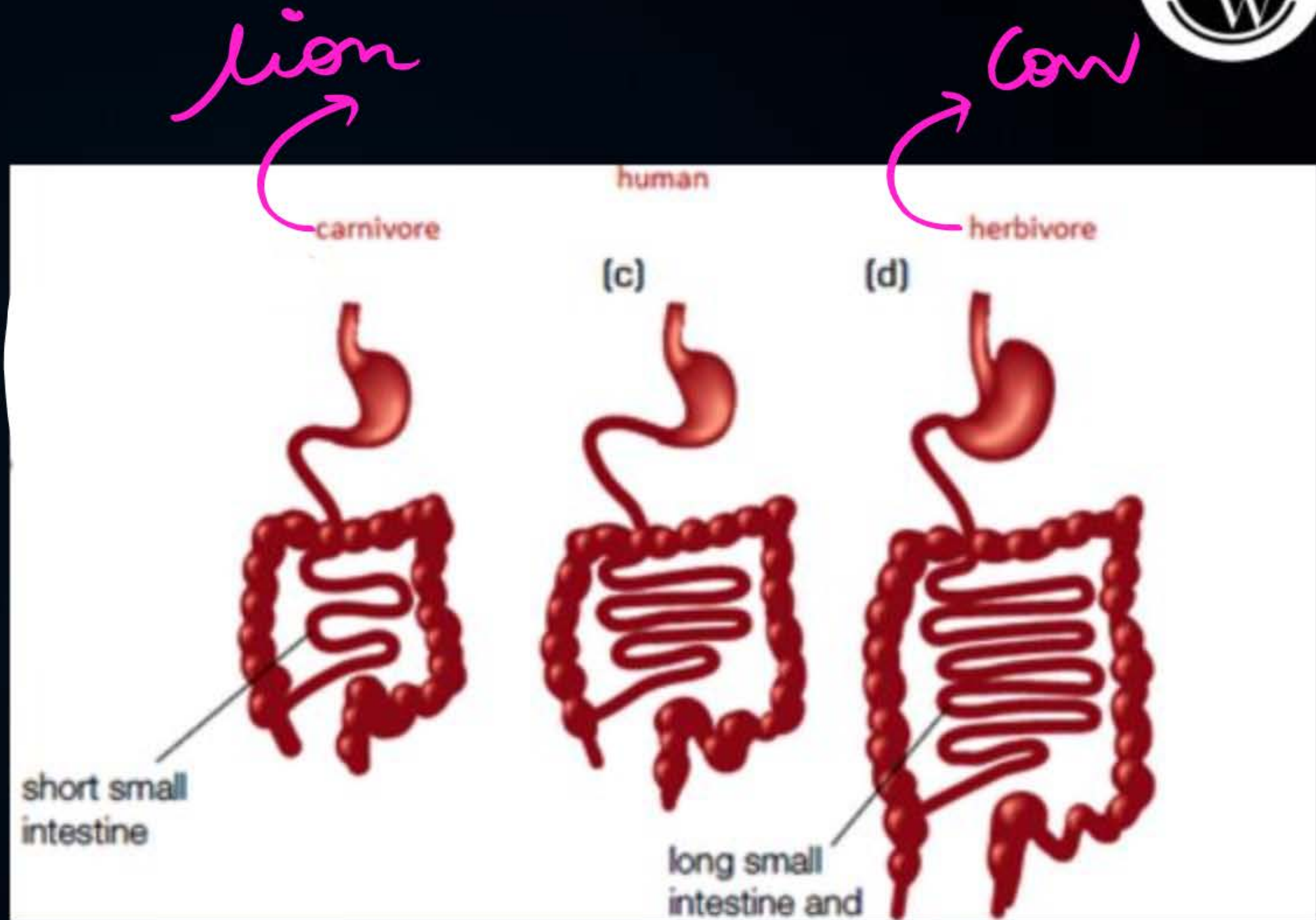




please note



Small intestine of herbivorous animals is longer than carnivores as herbivores consume plant based diet which contains cellulose which takes longer time to digest.





Which of the following organ secretes HCl in human body ?

- ☐ A Liver
- ☒ B Stomach → +HCl
- ☐ C Pancreas
- ☐ D Oesophagus

Which of the following is correct regarding bile juice ?

- ☒ A Secreted by liver ✓
- ☒ B Helps in emulsification of fats ✓
- ☒ C Makes food alkaline for the action of lipase ✓
- ☒ D All of the above ✓



## Question



Which enzyme is secreted by pancreas ?

- ☐ A Salivary amylase (Salivary amylase)
- ☒ B Trypsin (Pancreas)
- ☐ C Pepsin (Stomach)
- ☐ D Bile (Liver)

Most of the digestion and absorption of the food takes place in the

☒ A small intestine

☐ B liver

☐ C stomach.

☐ D large intestine

Villi





# Homework



- Make all the flowcharts in notes ✓
- Read NCERT (Nutrition) ✓
- DHA ✓

Ques - 4 & 5 ✓ ✓

(Module - Udaan - X)

Page - 55.



## Question of the Day



If gall bladder <sup>→ removed</sup>  
is removed, what impact on food digestion?





## Joke/Meme of the Day



Food enters human body

Le human digestive system\*





THANK  
YOU

