University of Mosul
Lecture No.:
College of Veterinary Medicine
Date:
Unit of Scientific Affairs
Website:

Lecture title: **Digestive system**

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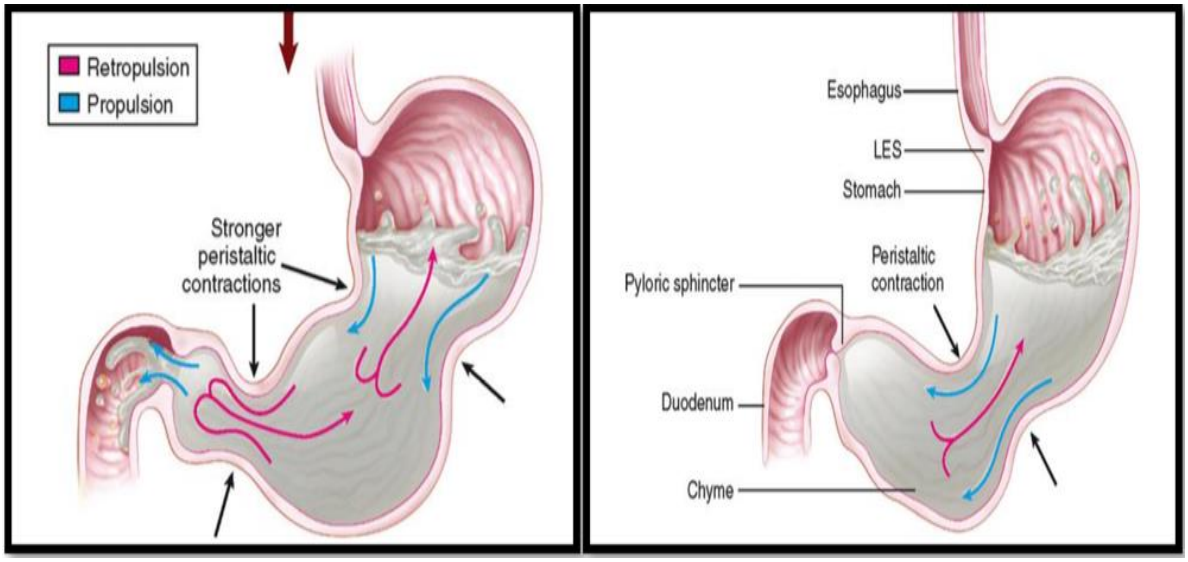
Summary:

hunger contractions

Define as rhythmical peristaltic contractions in the body of the stomach (pacemaker cell in the body of stomach that generate action potential) to push the content from fundus to pylorus, it is occurring when the stomach has empty for several hours or more



Motility of stomach

Intestine

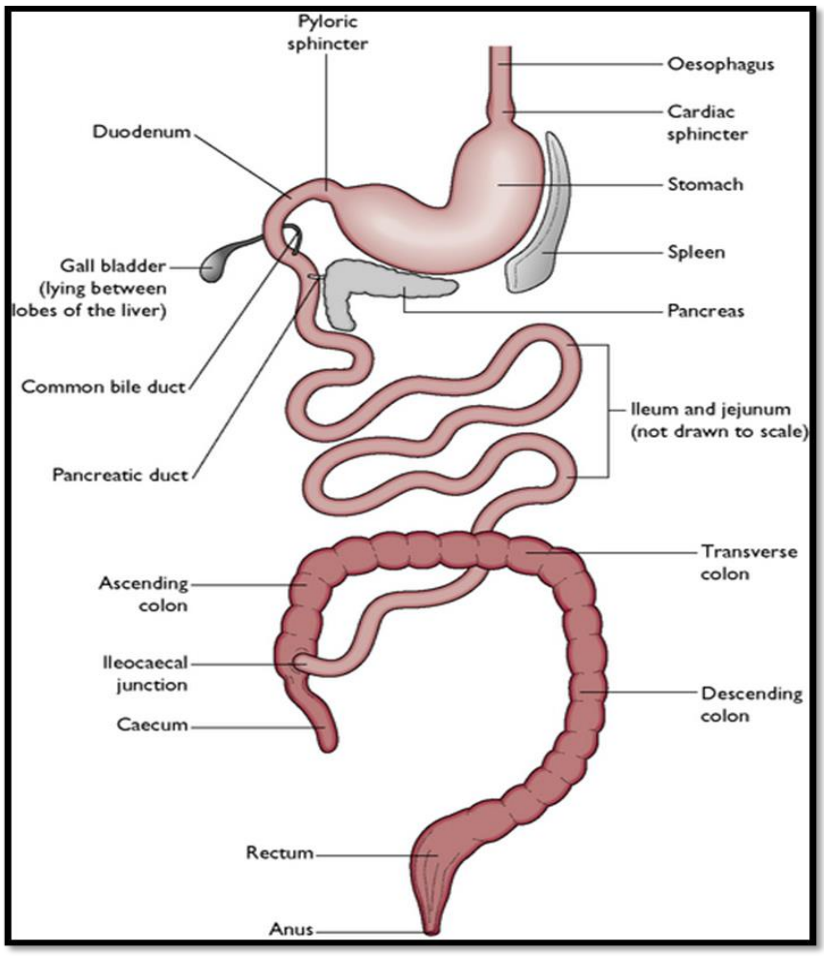
The intestine is divided in two parts:

1. small intestine: the subdivision to

- duodenum
- jejunum
- and ileum

2.large intestine: the subdivision to

- cecum
- colon
- rectum
- and anus



Small Intestine

✓ Like other components of GI tract, intestine also have four distinct layers namely mucosa, submucosa, muscularis, and serosa.

- ✓ Is the site where almost all of the digestion and absorption of nutrients and minerals by villi, and microvilli.

- ✓ Surface area of the small intestine is characterized by finger-like epithelial projections called as **villi** to increase the further increase surface area by about 10 to 14-fold.
- ✓ The villi are covered with **microvilli** to form brush border which further increases the surface area. Contain **Glycocalyx**, a jelly-like layer of glycoproteins covers the microvilli which contains digestive enzymes

The villi contain apex and base (Crypts of Lieberkühn) and lined by

1. Epithelial cells columnar epithelial cells with abundant in the villi and less in the crypt possess different functions in relation to digestion, neuroendocrine, and immunity.

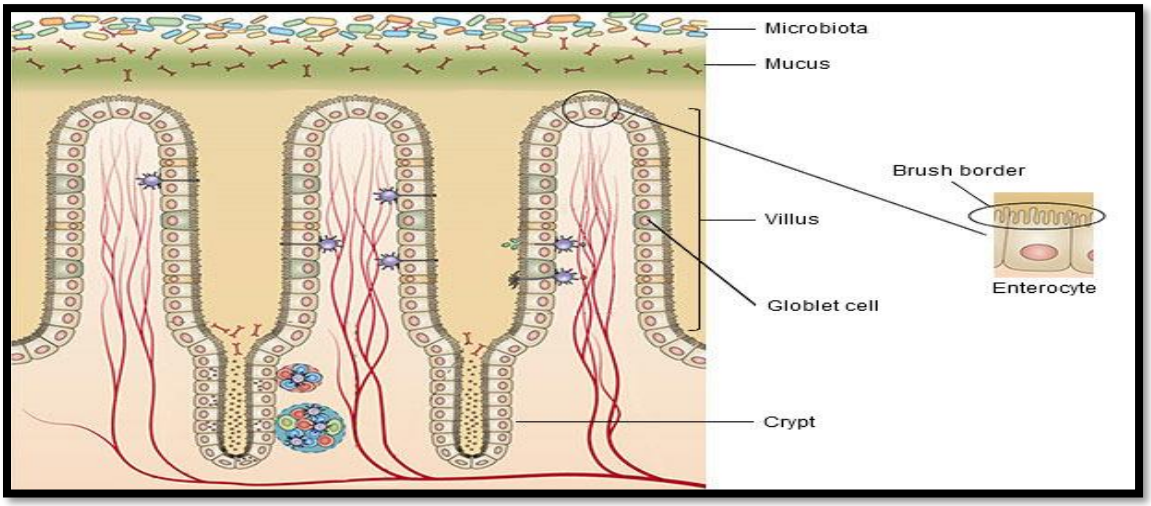
2. The enterocytes towards the lumen are called apex and the part opposite to lumen is called basolateral membrane. Nutrients are absorbed into enterocytes through apex and exit through basolateral membrane before entering into blood.

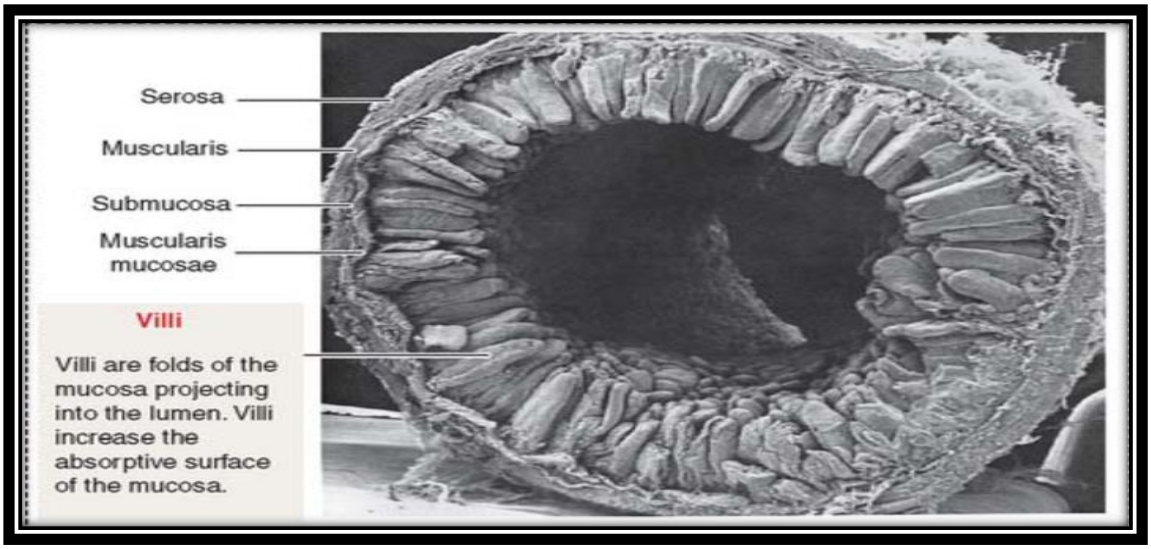
3. Goblet cells are situated between enterocytes that secret mucins provide physical defense against microorganism and digestive enzymes.

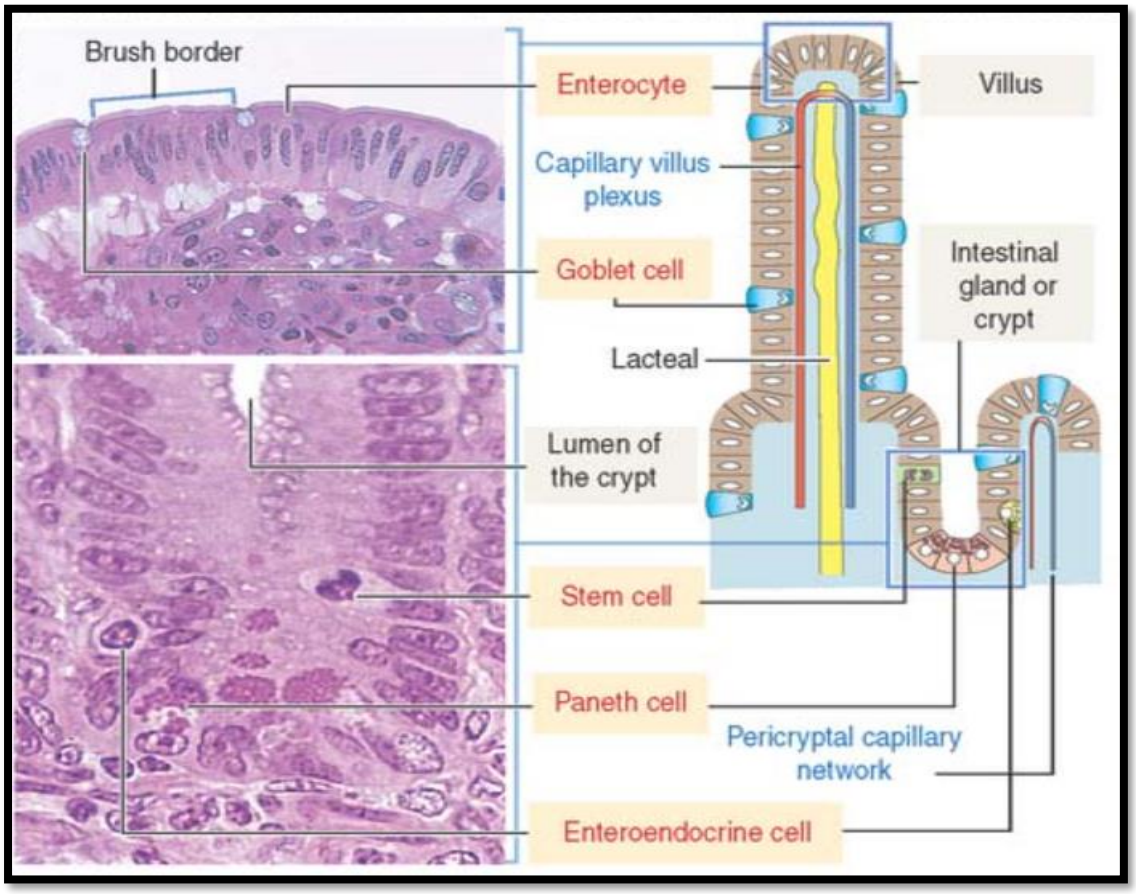
Crypts of Lieberkühn are the glandular structure at the base of villi.

1. **Epithelial stem cells** mitotically active, which divide and push upward to differentiating into enterocytes or goblet cells. Therefore, at the tips of villi when epithelial cells are sloughed lead to replacement/turnover.
2. **Microfold (M)** cells specialized epithelial cells found in the intestinal lymphoid tissue (**Peyer's patches**), M cells engulf luminal pathogens and their antigens by phagocytosis.
3. **Paneth cells** are situated at the base of the intestinal crypt responsible for the secretion of antimicrobial molecules important in gut innate immunity. In some species such as the horse, the crypts contain low numbers Paneth cells.
4. **Enteroendocrine cells** are interspersed within the crypts which produce hormones that may include somatostatin, cholecystokinin, and secretin.

5. The villous lamina propria is rich in both **capillaries and lymphatics** that help transport nutrients absorbed by enterocytes across the luminal surface.







Duodenum

- The gastric pylorus empties into the lumen of the duodenum. The duodenal submucosa contains extensive **Brunner's glands**, The secretions of the Brunner's glands are alkaline and help to neutralize the acidic digesta received from the stomach.
- The pancreatic duct and common bile duct insert into the wall of the duodenum and communicate with the duodenal lumen.

Jejunum

- It has long finger-like villi and the jejunum **does not contain Brunner's glands** in the submucosa. **Paneth cells** are found at the base of the crypts of Lieberkühn.

Ileum

- **Peyer's patches** are a characteristic feature of the ileum. it is a lymphoid tissue termed Peyer's patches. The Peyer's patches serve as both a primary and secondary lymphoid organ.