



AL-Mustaqbal University College

Pharmacy Department

First stage

Practical Histology

(Digestive system)

Small & Large Intestine

Lab 6

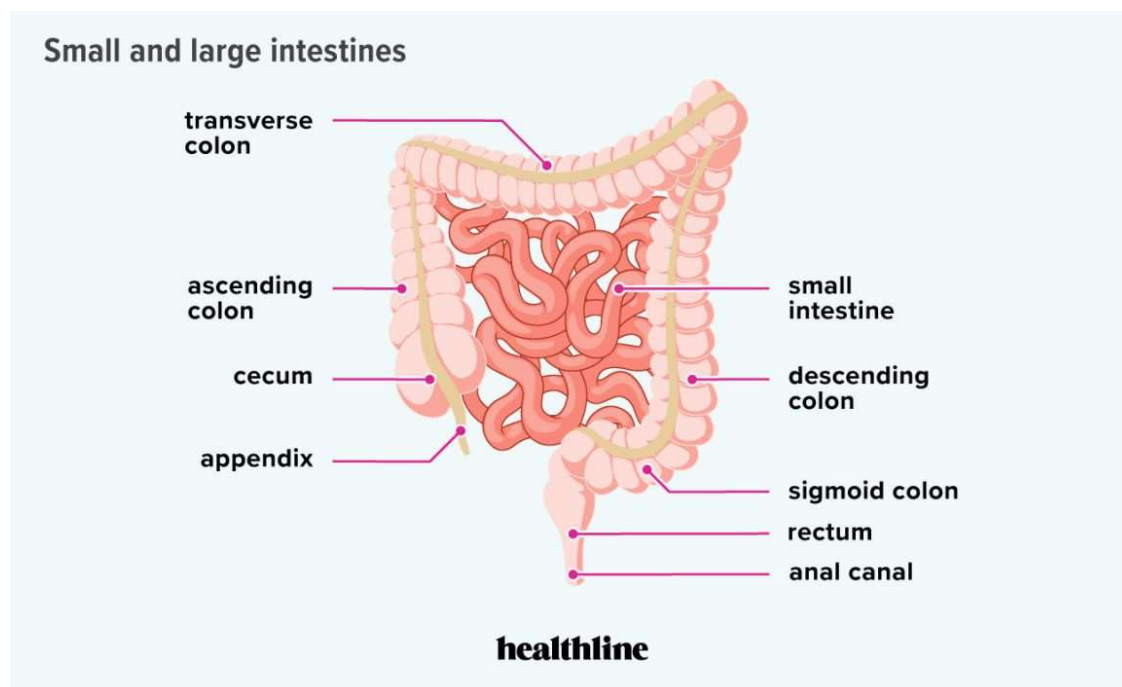


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Digestive system

The **small intestine**: Is the longest part of the digestive system. It extends from the stomach (pylorus) to the large intestine (cecum) and consists of three parts: duodenum, jejunum and ileum.

The main functions of the small intestine are to complete digestion of food and to absorb nutrients. The over length of the small intestine is about **5 meters**.



Histologically, the small intestine has four layers. From internal to external, they are mucosa, submucosa, muscularis externa, and serosa.

1- Mucosa:

- **Simple columnar epithelium** also called (intestinal absorptive cell) with goblet cell.
- **Lamina propria** contains intestinal gland (Lieberkühn gland).

- **Muscularis mucosa** composed of: **a-** Inner circular smooth muscle
b- Outer longitudinal smooth muscle

Lieberkühn gland (crypts) contains: 1- absorptive cells. 2- goblet cells. 3- enteroendocrine cells. 4- stem cells. 5- Paneth cells.

The **mucosa** of the small intestine exhibits specialized structural modifications that increase the cellular surface areas for absorption of nutrients and fluids. These modifications include the **plicae circulares, villi,** and **microvilli**

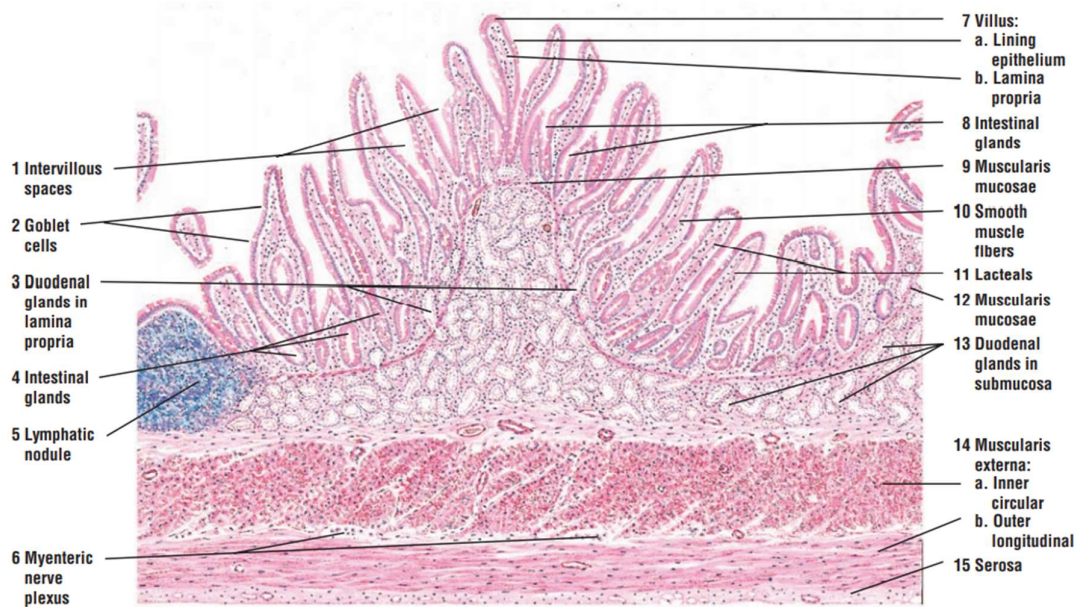
2- Sub mucosa: loose connective tissue.

3- Muscularis externa: **a-** Inner circular smooth muscle. **b-** Outer longitudinal smooth muscle.

4- Serosa.

The small intestine parts:

- ✚ The **duodenum** is the shortest segment of the small intestine. The **villi** in this region are broad, tall, and numerous, with fewer goblet cells in the epithelium. Branched duodenal (**Brunner's**) glands with mucus-secreting cells in the submucosa characterize this region.
- ✚ The **jejunum** exhibits shorter, narrower, and fewer villi than the duodenum. There are also more goblet cells in the epithelium.
- ✚ The **ileum** contains few villi that are narrow and short. In addition, the epithelium contains more goblet cells than in the duodenum or jejunum. The lymphatic nodules are particularly large and numerous in the ileum, where they aggregate in the lamina propria and submucosa to form the prominent Peyer's patches.



■ Duodenum of the small intestine (longitudinal section). Stain: hematoxylin and eosin.
Low magnification.

Large intestine: Posterior section of the intestine, consisting typically of four regions: the cecum, colon, rectum, and anus. The term colon is sometimes used to refer to the entire large intestine. The large intestine is wider and shorter than the small intestine (approximately 1.5 meters).

Has three parts: Caecum, colon and rectum

Histologically, its wall composed of:

1- Mucosa: has no villi, (simple columnar epithelium) with numerous goblet cells.

- **Lamina propria** has simple tubular glands which are composed of:
 - Intestinal absorptive cells
 - Large number of goblet cells
 - Enteroendocrine cells (few in number).
 - Undifferentiated cells (stem cells) located in the lower 1/3 of the glands, they are important in regeneration of cells.

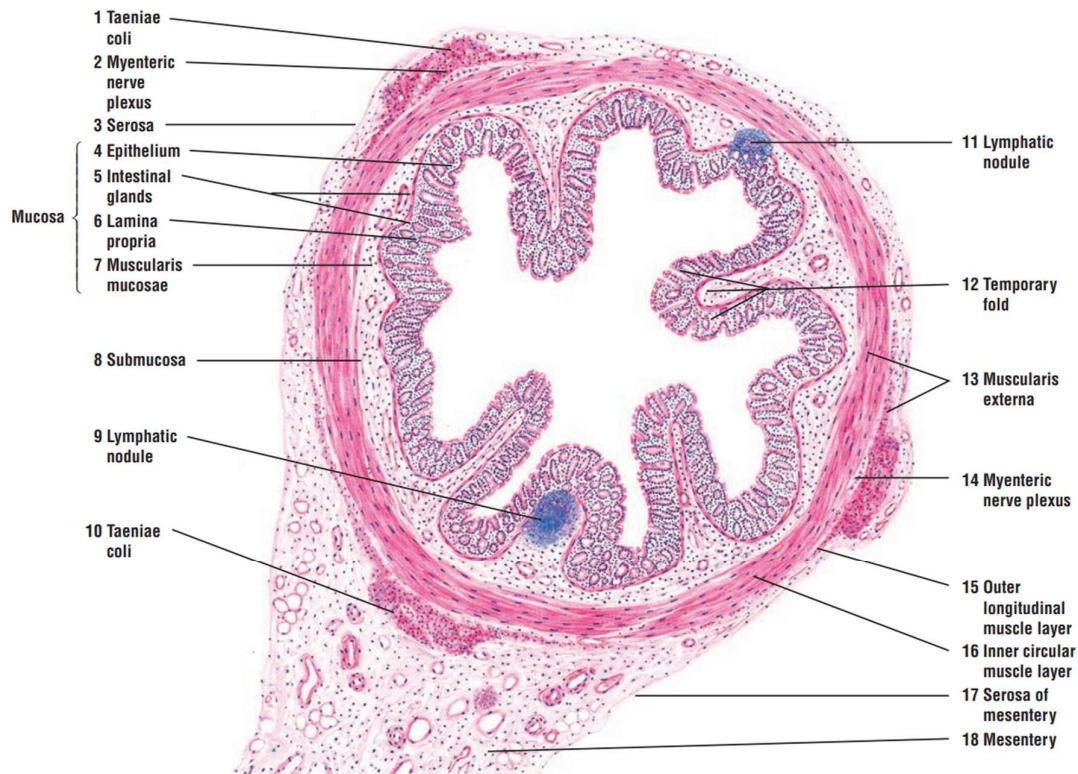


FIGURE 13.8 ■ Large intestine: colon and mesentery (panoramic view, transverse section). Stain: hematoxylin and eosin. Low magnification.

➤ **Muscularis mucosa:** a-inner circular smooth muscle. b- outer longitudinal smooth muscle.

2- Submucosa: loose connective tissue with large number of vessels, (thicker than SI).

3- Muscularis externa: composed of: **a-** inner circular smooth muscle.

b- outer longitudinal bundles of smooth muscle fibers called teniae coli.

4- Serosa.

The large intestine lacks folds or villi. It is characterized by many tubular intestinal glands with large numbers of goblet cells. This is sometimes described as a glandular epithelium. Abundant lymphatic tissue is common in the lamina propria (owing to the large bacterial population in the lumen of the large intestine).