

Bio& 242 Unit 1/ Lab 2

Histology of the Digestive System

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Basic tissues layers of the GI Tract. Also know the specializations of these layers for the different parts of the GI tract.

1. Mucosa:

- Nonkeratinized Stratified Squamous:* (Oral cavity, Pharynx, Esophagus and Anus)
- Simple Columnar:* (Stomach, Small Intestine, and Large Intestine)
- Specialized cells:* (Goblet cells, Parietal cells, Chief cells, D cells, Enteroendocrine cells, and Brush border cells)
- Microscopic folds:* (Gastric pits, Crypts of Lieberkuhn, Intestinal crypts)
- Macroscopic or gross folds:* (Small Intestine – villi, Stomach – rugae Large Intestine - Haustra)

Lamina Propria:

- Loose connective tissues:* contains capillaries and lacteals.

Muscularis Mucosae:

- Thin layer of smooth muscle

2. Submucosa:

- Dense irregular connective tissue*
- Glands:* (Brunner's glands and Submucosal Mucus glands)
- Lymph nodes* (MALT or Peyer's Patches),
- Innervations (Submucosal or Meissner's plexus)

3. Muscularis externa:

- Circular Muscle layer:* smooth muscle
- Longitudinal Muscle layer:* smooth muscle
- Oblique Muscle layer:* smooth muscle found only in the stomach
- Innervation:* (Myenteric or Auerbach plexus)

4. Serosa:

- Visceral Peritoneum:* (Stomach, Small Intestine, and Large Intestine)
- Adventitia:* (Esophagus and Anus)

Esophagus:

Slide 57:

Mucosa:

Epithelium: Nonkeratinized Stratified Squamous

Lamina Propria: Thick band consisting of areolar tissue or loose connective tissue

Muscularis mucosa: Broken up on some slides, appears to be a thicker band of smooth muscle in esophagus then in other organs

Submucosa: Band of connective tissue with abundant blood vessels.

Muscularis
Serosa: Contains well-developed multicellular mucous glands.
Look for ganglion cells of the submucosal plexus, will look similar to the ganglion cells of the retina.
Be sure you can identify both the circular and longitudinal layers
Adventitia

Slide 58: This slide contains the **esophageal-stomach junction**. You will be able to observe most of the structures from slide 57. Look for the transition zone where the epithelium changes from nonkeratinized stratified squamous in the esophagus to simple columnar in the stomach. Most of the stomach structures indicated below should also be visible.

Stomach:

Slide 59:

Mucosa: **Scanning power** you should be able to observe rugae, large folds of the surface that increase surface area
Lower power you should see the gastric pits, down folds of the mucosa that extend in the lamina propria.
High power you should be able to identify the species cells of the gastric pits: mucous cells (goblet cells), Parietal cells, Chief cells, and G-cell (enteroendocrine cells). Use their relative location in the pits and difference in stain color to help identify the cells.
Lamina propria: Found interspersed between gastric pits, will not be seen as a thick band as in the esophagus
Muscularis mucosa: Appears as a well-defined thin band of smooth muscle in the stomach
Submucosa: Appears as a thin and often broken-up layer of connective tissue on stomach slides
Muscularis: Three layers in the stomach: oblique, circular, longitudinal
Serosa: Visceral Peritoneum

Small Intestine:

Duodenum

Slide 60:

Mucosa: **Scanning power** look for the large folds plicae circularis.
Lower power look for villi,
High Power you should be able to observe the simple columnar epithelium lining the surface of the villi.
Lamina Propria: Found extending up into the villi where it contains lymphatic capillaries called lacteals.
Muscularis mucosa: Thin band of smooth muscle usually fairly easy to found in the duodenum.
Submucosa: Contains Brunner's glands
Muscularis: Be sure you can identify both the circular and longitudinal layers
Serosa: Visceral Peritoneum

Ileum

Slide 61:

Mucosa: **Scanning power** look for the large folds (plicae circularis).
Lower power look for villi and Crypts of Lieberkuhn

High Power you should be able to observe the simple columnar epithelium lining the surface of the villi.
 Lamina Propria Contains Peyer's Patches or MALT.
 Muscularis mucosa: Thin band of smooth muscle usually broken up by the Peyer's Patches.
 Submucosa Broken up by the Peyer's Patches that extend into this layer.
 Muscularis Be sure you can identify both the circular and longitudinal layers
 Serosa: Visceral Peritoneum.
Sides 64, 65 Slides of the small intestine, test your knowledge after reviewing 60 and 61.

Small Intestine Model

Be sure you can identify the following layers and structures on the generic small intestine model

Mucosa: Find Villi, simple columnar epithelium, and Crypts of Lieberkuhn
 Lamina Propria Fills in the center of the villi and contains lacteals
 Muscularis mucosa: Thin band of smooth muscle separating the Lamina Propria from the submucosa.
 Submucosa: Find the Submucosal or Meissner's plexus and Peyer's Patches or MALT
 Muscularis Be sure you can identify both the circular and longitudinal layers. Also, find Myenteric or Auerbach plexus

Large Intestine:

Slide 62:

Mucosa: **Scanning power** look for the large folds (haustral folds)
High Power you should be able to observe the simple columnar epithelium. Look for the downward-folded intestinal pits
 Lamina propria Appears broken up by the intestinal pits.
 Muscularis mucosa: Thin band of smooth muscle usually fairly easy to found in the large intestine.
 Sibmucosa: Usually seen as a thin band of connective tissue.
 Muscularis Be sure you can identify both the circular and longitudinal layers
 Serosa: Visceral Peritoneum

Slide 63:

Recto-anal Junction (Similar to slide #58, Gastroesophageal Junction except Recto-anal junction will have MANY goblet cells on the rectal side of the junction).
 Mucosa: Look for the transition from simple columnar epithelium with intestinal pits to nonkeratinized Stratified Squamous.