

Al-Mustaqbal University college
Department of pharmacy



1st Class, 2st Semester

HISTOLOGY

Lab4: HISTOLOGY OF DIGESTIVE SYSTEM.

Asst. Lecturers

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o BASIC PATTERN:

INTRODUCTION

1) Mucosa

a- Epithelium

b- Lamina propria

c- Muscularis Mucosa

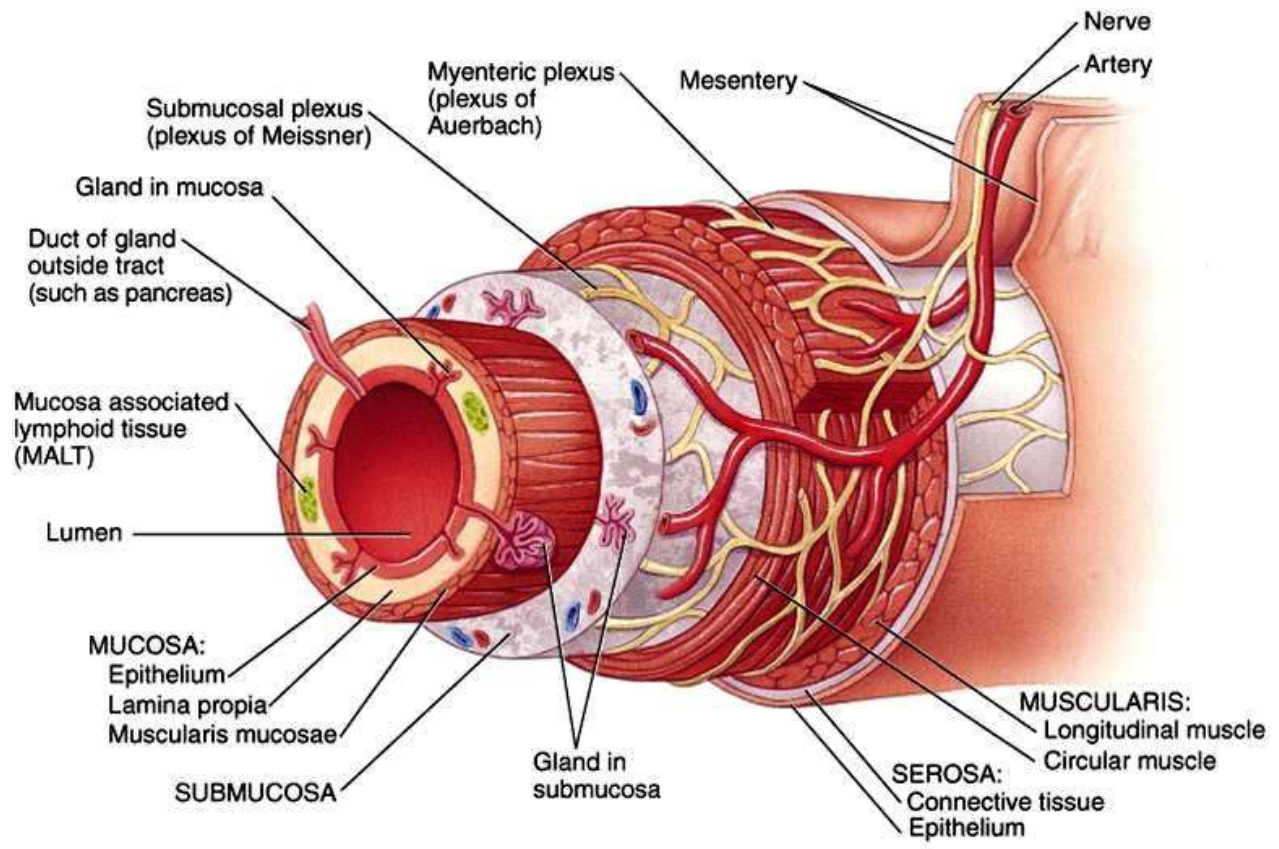
2) Submucosa

Submucosal plexus
“Plexus of Meissner”

3) Muscularis Externa

Myenteric plexus
“Plexus of Auerbach”

4) Serous layer /
Adventitial layer



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1- MUCOSA

A- EPITHELIUM:

It is columnar (Absorption/secretion) all over except in the Esophagus and the lower part of Anal canal where it is stratified squamous (Protection).

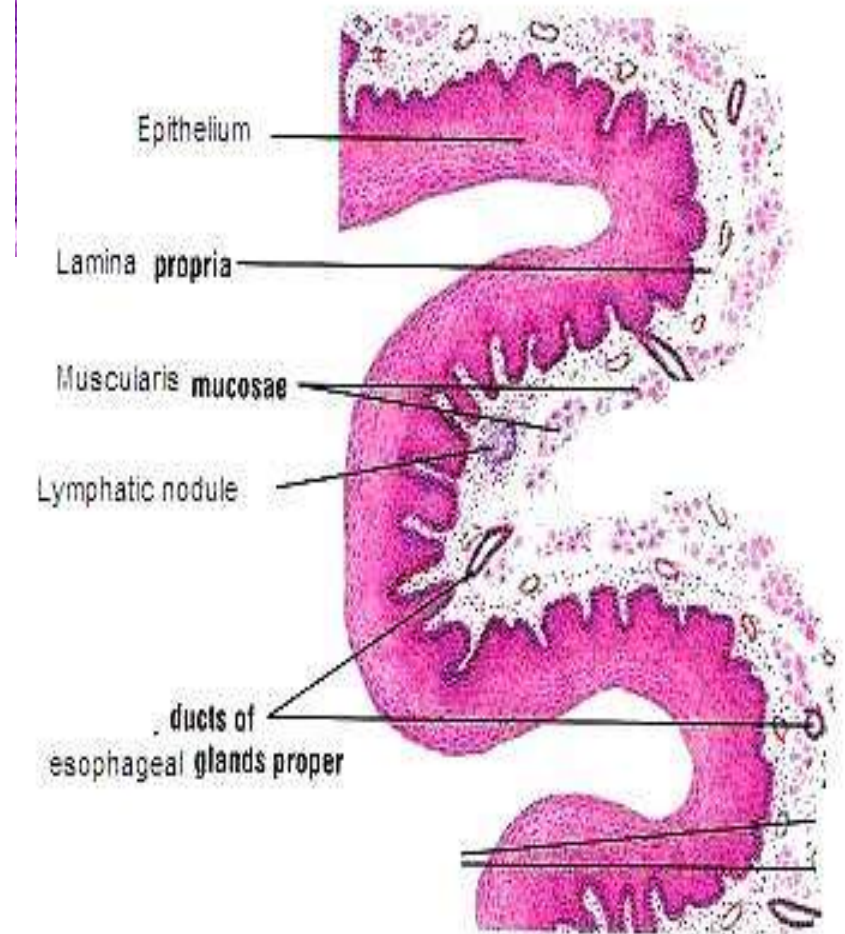
- Numerous folds

B- LAMINA PROPRIA:

- Made up of Collagen and reticular fibers. contain blood capillaries, lymph vessels and nerves.

C- MUSCULARIS MUCOSAE

- Thin layer of smooth muscle,
- **Inner layer: Circular**
- **Outer layer: Longitudinal**
- Contraction of Muscularis Mucosa is important for the local mixing of intestinal contents
- It changes the shape of mucosa, that helps in absorption and secretion



2- SUBMUCOSA

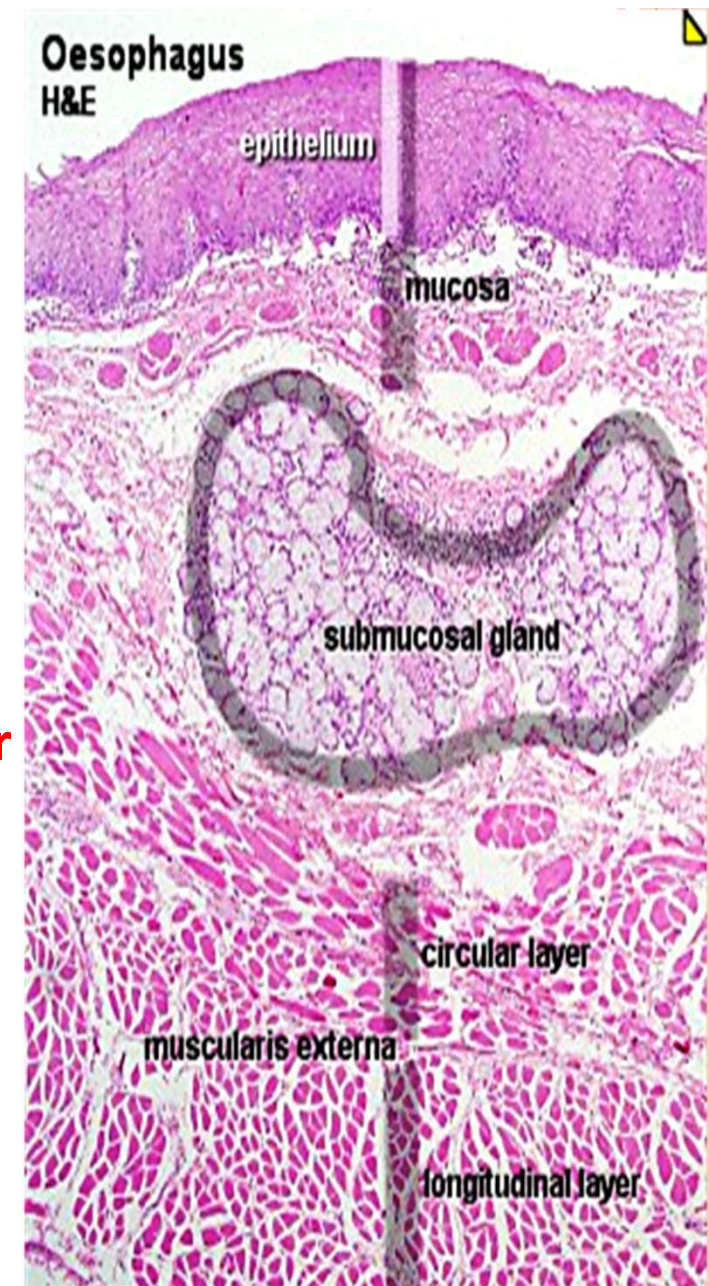
- This layer consists of **loose areolar tissue** that connects mucosa to the muscularis externa.
- Its looseness permits some mobility of mucosa over the muscularis externa.
- Contain numerous **blood vessels, lymphatics and nerve fibres and Meissner's plexus.**

3- MUSCULARIS EXTERNA


- It consists of **smooth muscles** all over GIT **except upper part of oesophagus which contain skeletal muscles.**
- Arranged in two layers:
- **Inner layer: Circular**
- **Outer layer: Longitudinal**
- Inner circular layer acts as sphincter. Eg: Pyloric sphincter, Internal anal sphincter.

4-SEROSA /ADVENTITIAL LAYER

- It is peritoneum composed of **connective tissue** and **simple squamous epithelium.**
- The oesophagus lies outside the abdominal cavity has a superficial layer called **Adventitia** which consists of areolar connective tissue



OESOPHAGUS

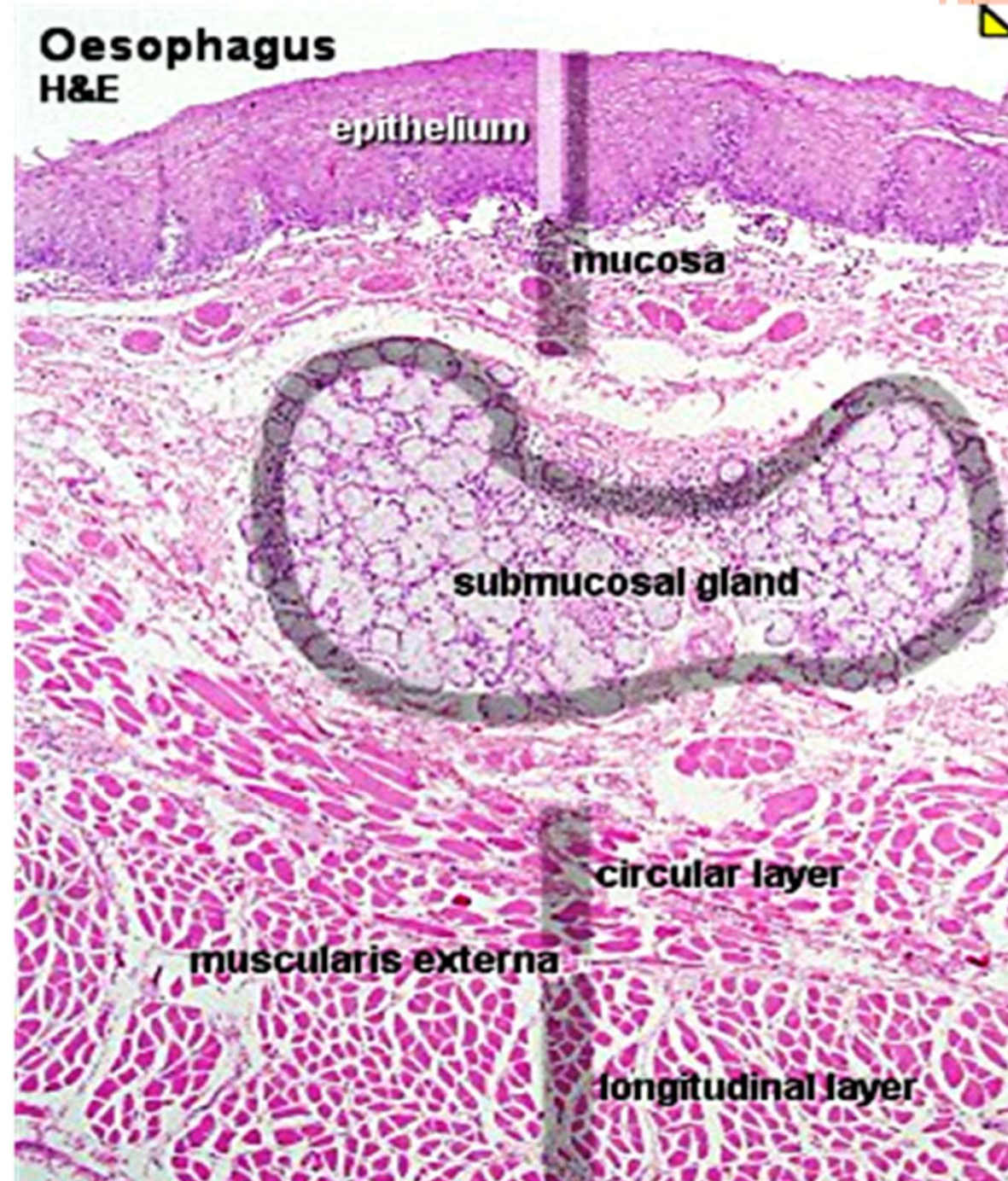
- It is a straight muscular tube extending from pharynx to the stomach in abdomen.
 - **1- MUCOSA:**
 - a- *Epithelium*: Non- Keratinized stratified squamous epithelium
 - b- *Lamina Propria*: Thin layer of loose C.T.
 - c- *Muscularis Mucosae*: It is single layer of longitudinally running smooth muscle fibers.
 - **2- SUBMUCOSA:**
 - It is a wide layer of irregular, moderately **dense connective tissue** composed of bundles of **collagen** and **elastic** fibers.
 - Due to elastic fibers mucosa is thrown into folds, hence lumen of esophagus appears star shaped
 - Contains blood vessels and branched tubulo- alveolar mucous glands.
- 

3-MUSCULARIS EXTERNA

- Arranged in two layers:
 - **Inner layer: Circular**
 - **Outer layer: Longitudinal**
- * Between the two layers – *Myenteric plexus of nerve fibre and ganglion cells* are present.

4-SEROSA / ADVEVTITIA

- It consists of **loose areolar connective tissue**, which merges with the connective tissue of surrounding structures.



STOMACH

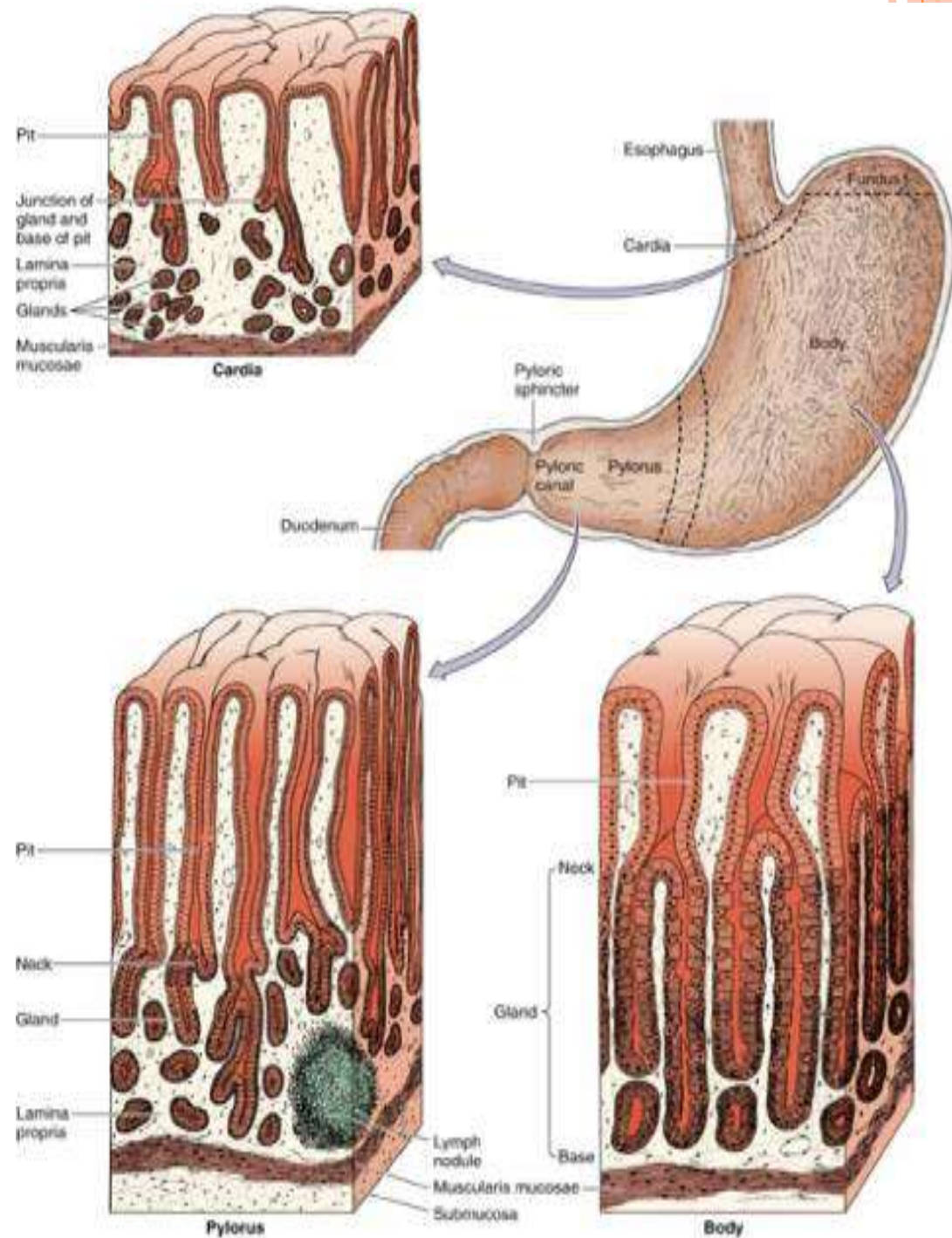
- Stomach is dilated segment of the digestive tract, that digest and secretes hormone
- There are four histological region

A- Cardia

B- Fundus

C- Body

D- Pylorus



A- CARDIAC REGION OF THE STOMACH

1-Mucosa:

- Epithelial lining at the cardio-oesophageal junction **changes from stratified sq. to simple columnar epithelium**
- Presence of Mucous surface cells and cardiac glands

2-Submucosa:

Contain blood vessels

3-Muscularis externa:

Inner – Oblique

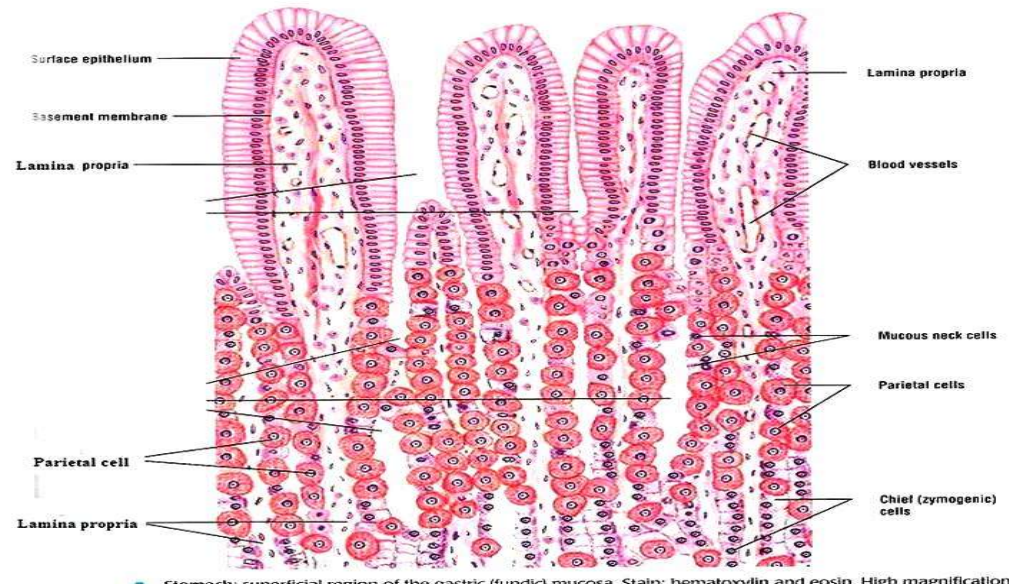
Middle – circular

Outer – longitudinal

4-Serosa:

Simple squamous epithelium resting on a thin layer of connective tissue

B+C- STOMACH –FUNDUS AND BODY



○ 1- Mucosa: A-Epithelium

Simple columnar epithelium

B-LAMINA PROPRIA:

- Small tubular fundic/gastric glands are present.
- 1-Mucous neck cells: Produces soluble mucus
- 2-Parietal or oxyntic cells: Secrete HCL and intrinsic factor
- 3- Chief or zymogenic cells: Secrete pepsinogen which is converted into pepsin in an acid environment
- 4- Enteroendocrine and APUD cells: Secrete serotonin, histamine and gastrin

C- MUSCULARIS MUCOSAE:

IT CONSISTS OF TWO THIN LAYER OF SMOOTH MUSCLES



2- SUBMUCOSA:

- Consists of blood vessels, lymphatic vessels and Meissner's plexus.


3- MUSCULARIS EXTERNA:

- **Inner:** Oblique/ **Middle:** circular/ **Outer:** Longitudinal

4- **SEROSA:** consists of loose connective tissue

D- STOMACH- PYLORUS

○ MUCOSA:

- Epithelium: Simple columnar as in fundic part
 - Pyloric glands occupy the lamina propria
 - Gastric pits are deeper
 - Glands are short, tortuous and branched
 - Produce mucus and gastrin
 - Muscularis mucosa and Submucosa are similar to fundic part
- 

DIFFERENCE BETWEEN CARDIA, FUNDUS & BODY, AND PYLORUS

CARDIA	FUNDUS & BODY	PYLORUS
Contain cardiac gland	Contain gastric gland	Contain pyloric gland
Gastric pit less deeper than pyloric gland	Gastric pit less deeper than pyloric gland	Gastric pit more deeper than gastric or cardiac gland
Parietal cells absent or very few	Parietal cells more	Parietal cells few

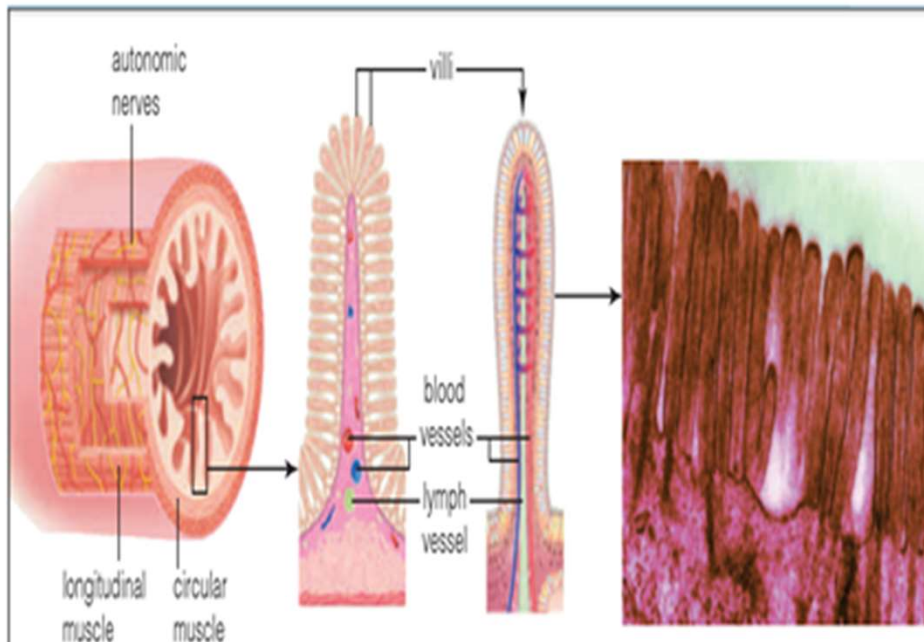
SMALL INTESTINE

It is divided into **duodenum**, **jejunum** and **ileum**.

○ **Mucosa:** characteristic features-

✓ Plicae circularis

✓ Villi & Microvilli

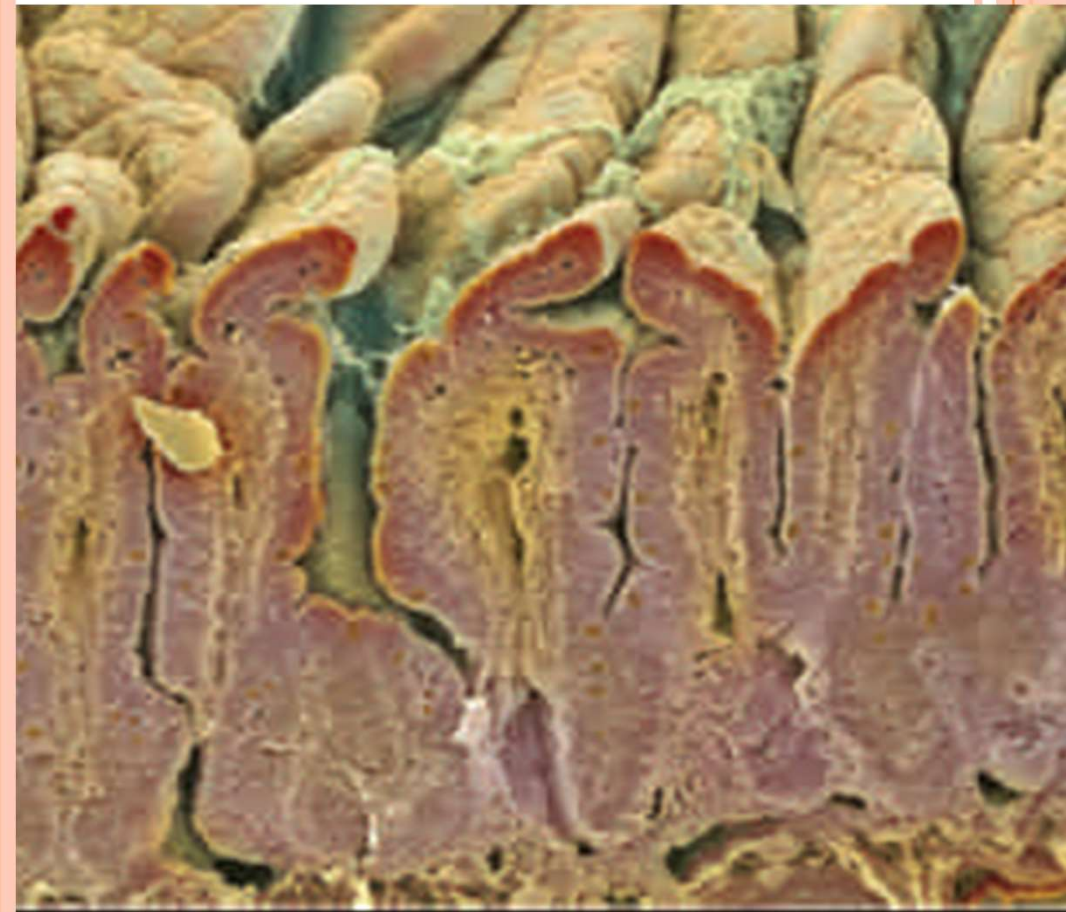


B Structure of the wall of the small intestine.

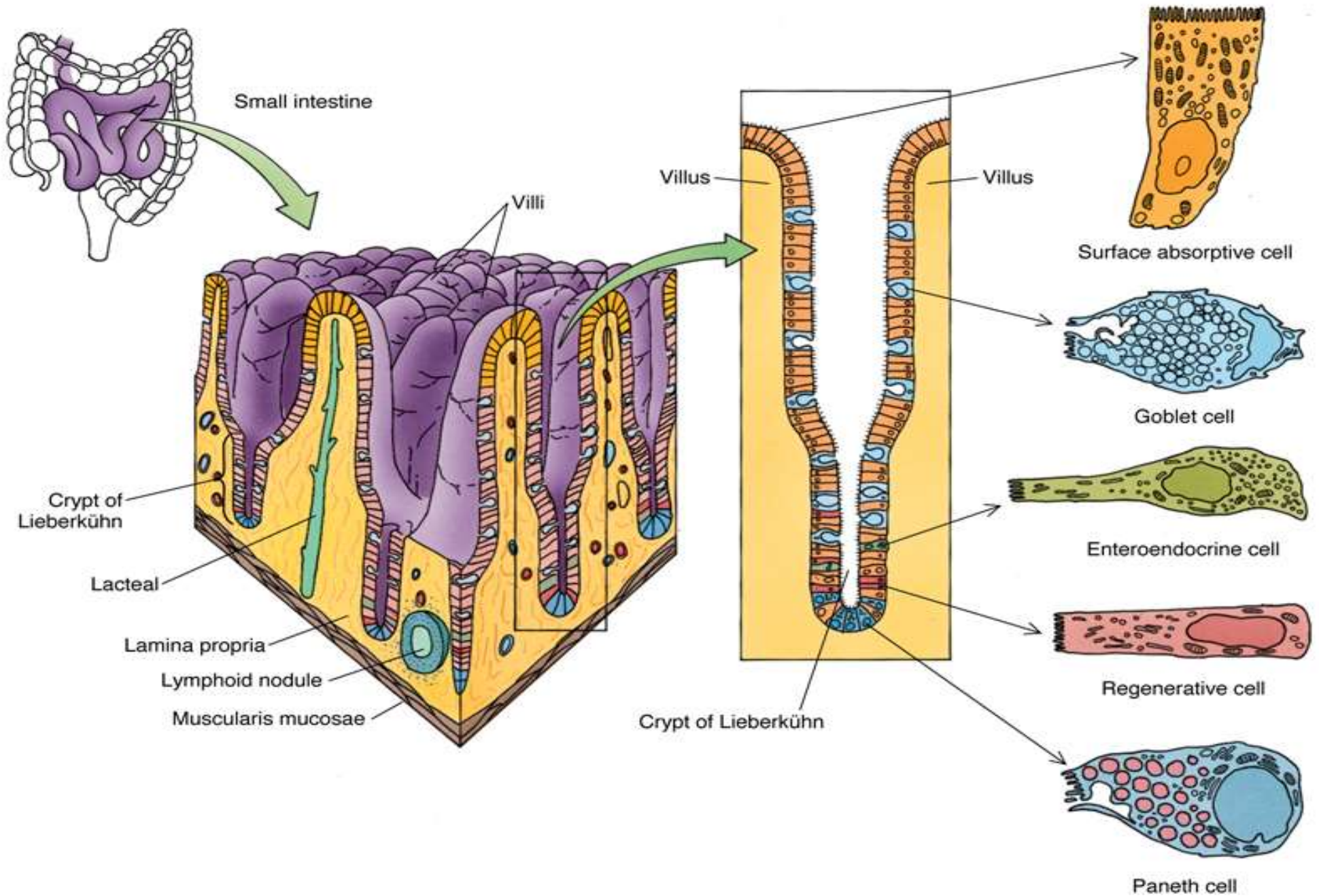
C One intestinal fold with hairlike villi at its surface.

D One villus with brush border cells at its surface.

E Micrograph of microvilli at the surface of a brush border cell.



SMALL INTESTINE



LARGE INTESTINE

○ It consists of:

appendix, cecum, colon, rectum and anal canal.

1-Mucosa: Absence of Plicae circulares and villi

Presence of **Microvilli**

Presence of **Crypts of Lieberkuhn**

Presence of **Goblet cells** in large number

2- Submucosa

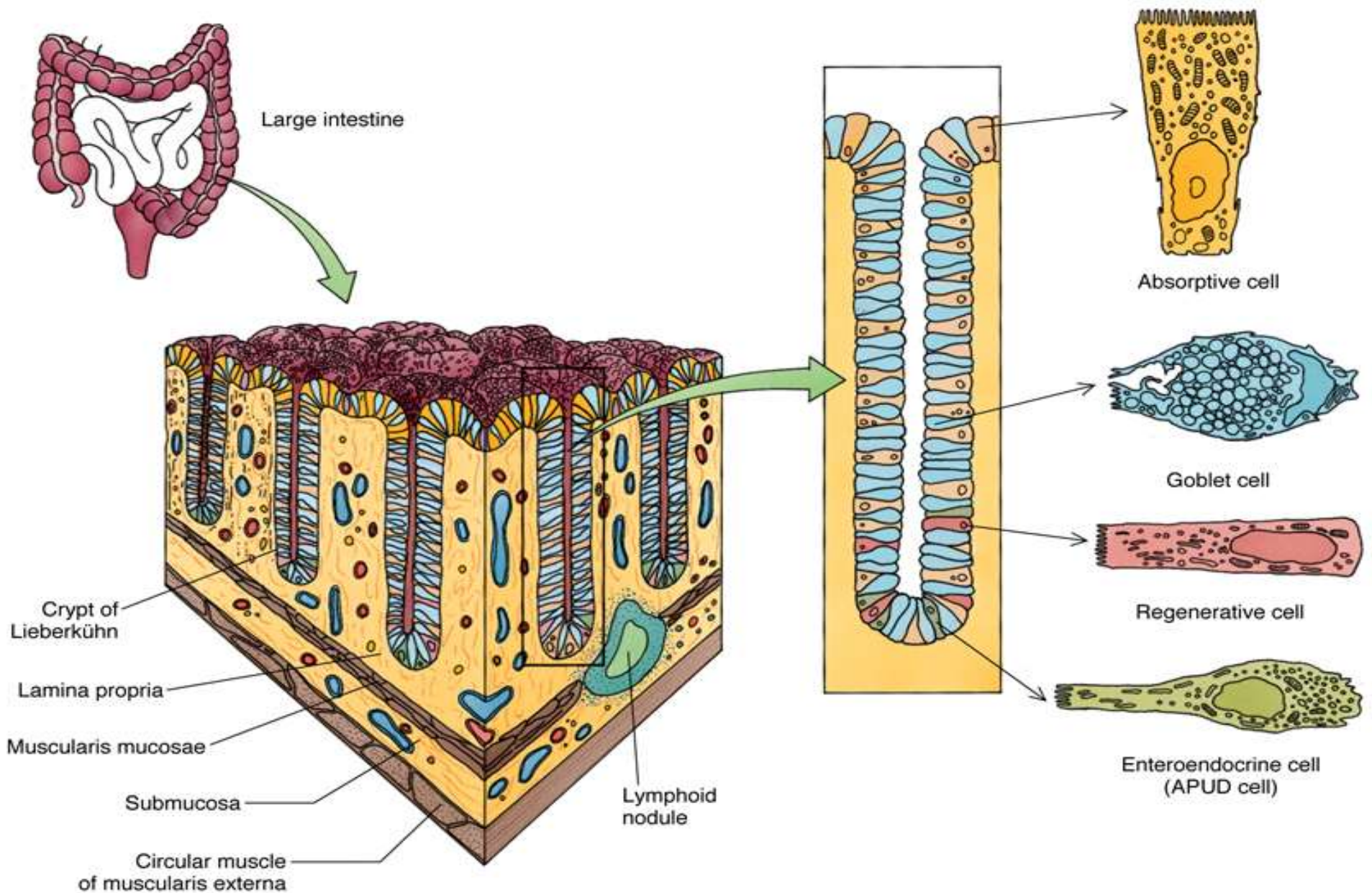
3- Muscularis externa:

Inner circular layer - thin compared to small intestine.

Outer longitudinal layer- forms **Taenia coli**.

4- Adventitia: **Appendices epiploicae** (peritoneum forms pouch like processes filled with fat)

LARGE INTESTINE



ANAL CANAL

- Epithelium:
- upper part-simple columnar,
- middle part-stratified squamous non-keratinized,
- lower part-covered by true skin.

