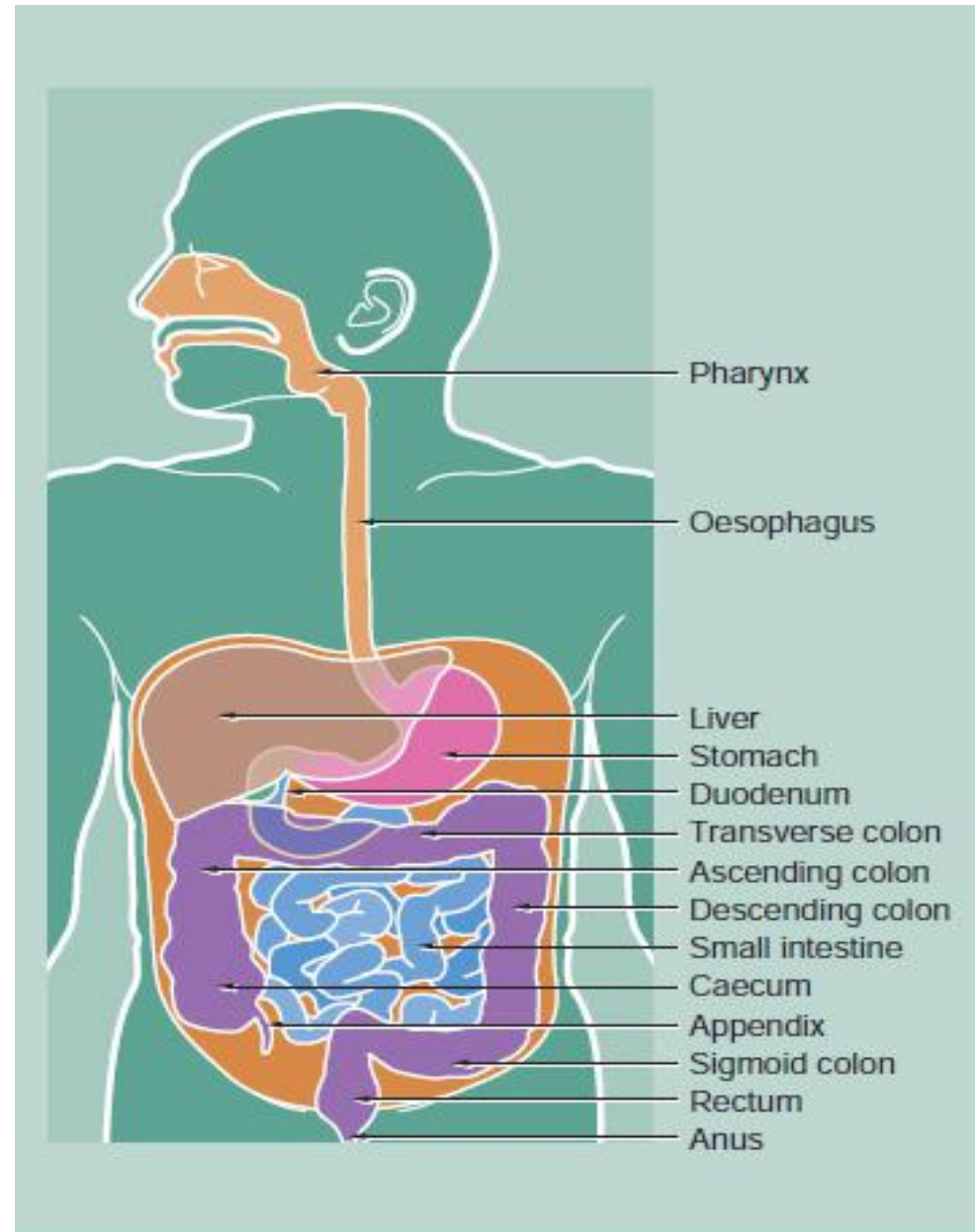


DIGESTIVE SYSTEM II

GIT OR ALIMENTARY CANAL

- This is in the form of tube.
- Extend from oral cavity to anus.
- Parts of GIT—
- Oral cavity
- Pharynx
- Oesophagus
- Stomach
- Small intestine
- Colon
- Rectum
- Anal canal



INTRODUCTION

- **GENERAL HISTOLOGY OF ALIMENTARY CANAL**

- It is tubular structure
- Four layers in the wall
- Layers from deep to superficial:—

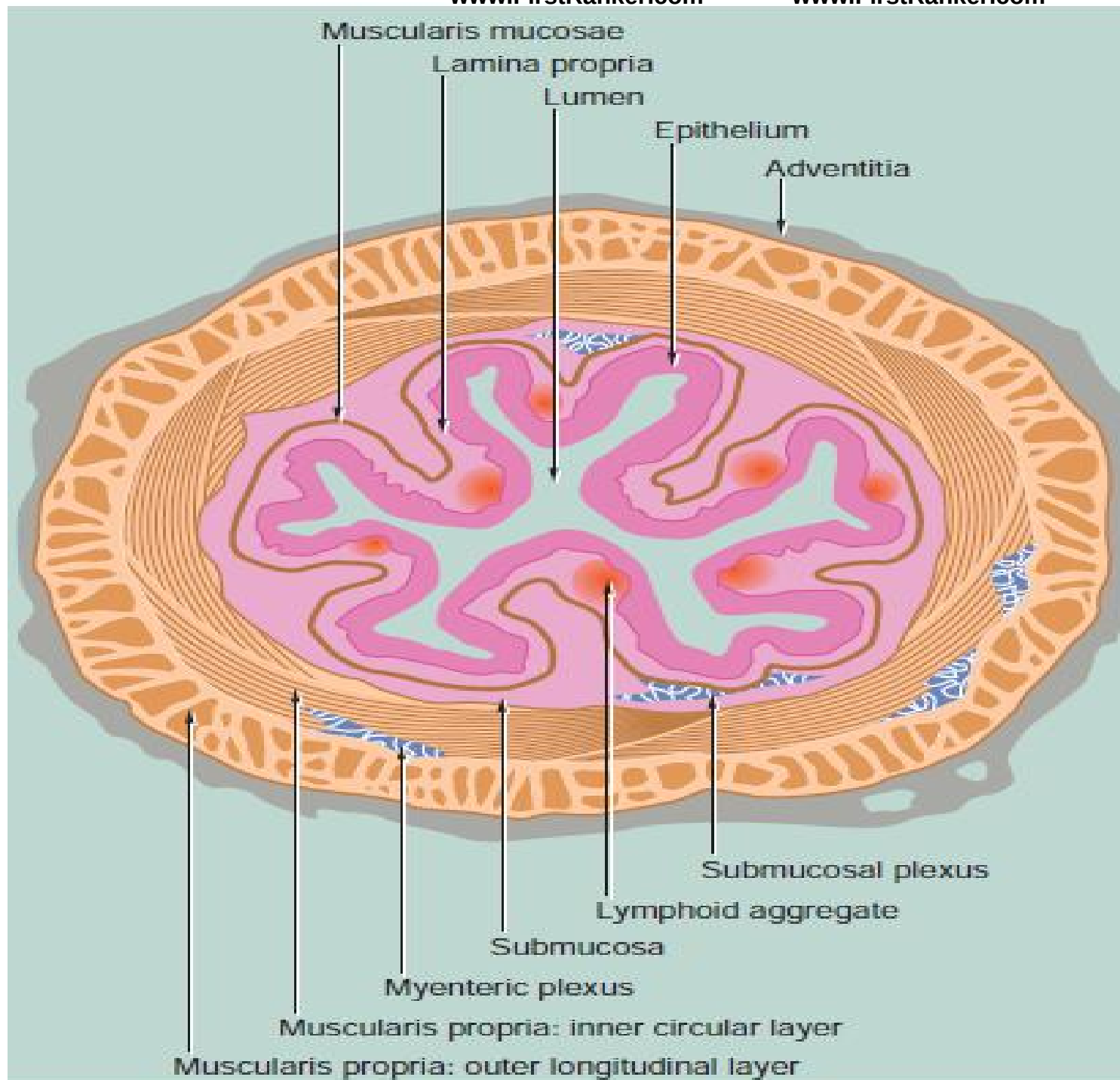
I) Mucosa

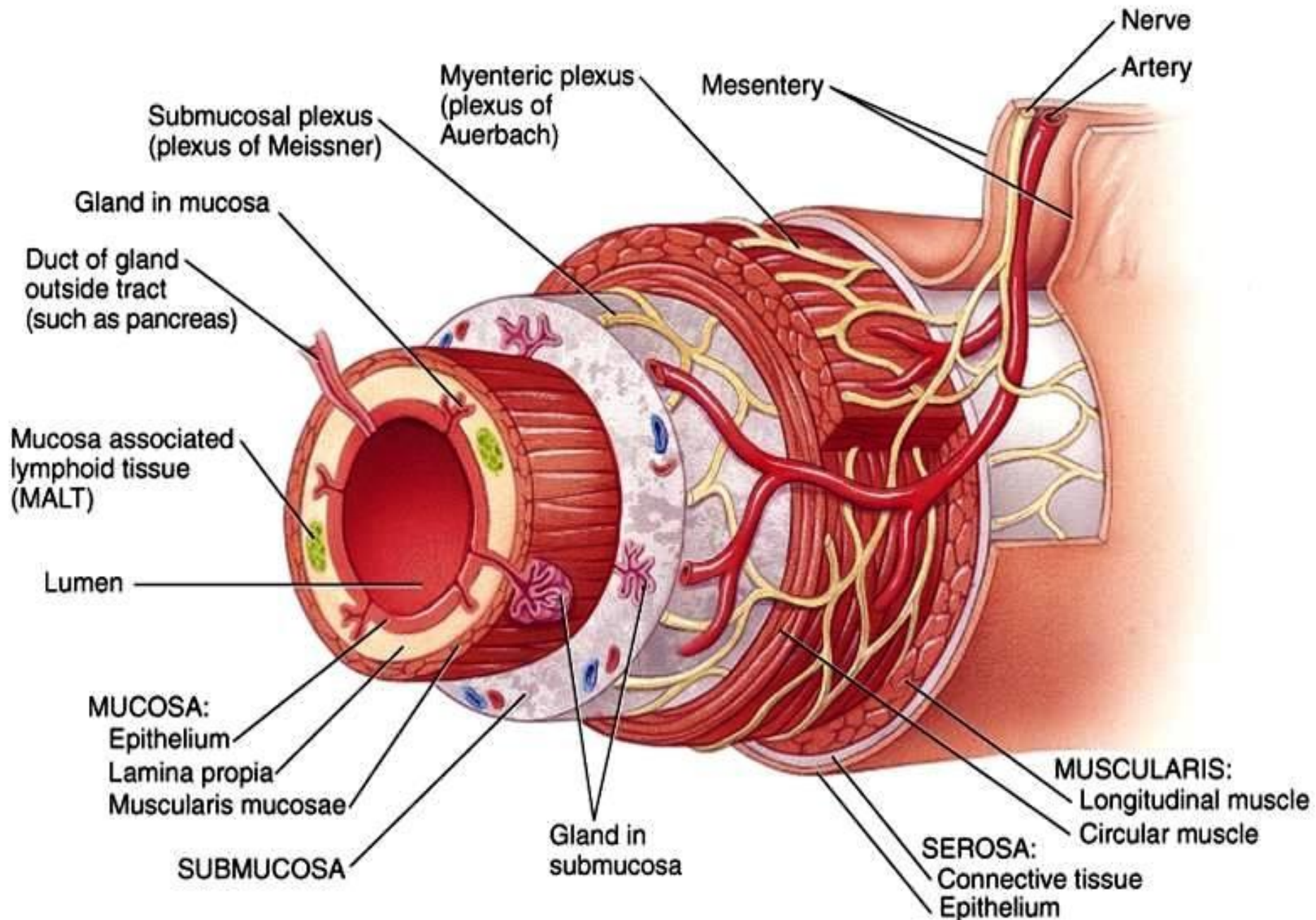
- *Epithelium*
- *Lamina propria*
- *Muscularis Mucosae*

II) Submucosa

III) Muscle layer

IV) Serous layer / Adventitial layer





MUCOSA

- Innermost layer of alimentary canal.

- *Epithelium*

It is *simple columnar* (Absorption/secretion) all over

except in the *Oesophagus* and the *lower part of Anal canal* where it is *stratified squamous* (Protection).

<i>Organ</i>	<i>Epithelium</i>
Mouth	Nonkeratinized Stratified Squamous
Pharynx	Nonkeratinized Stratified Squamous
Esophagus	Nonkeratinized Stratified Squamous
Stomach	Simple Columnar
Small Intestine	Simple Columnar
Large Intestine	Simple Columnar
Anus	Nonkeratinized Stratified Squamous

- *Lamina propria*
- Layers of loose connective tissue
- Supports the epithelium
- Contains blood and lymphatic vessels
- It also contain glands (gastric glands)
- It also contains *mucosa associated lymphoid tissue (MALT)*.

- ***Muscularis mucosae***
 - Thin layer of smooth muscle that separates lamina propria with the submucosa.
 - Inner layer: *Circular*
 - Outer layer: *Longitudinal*
 - It changes the shape of mucosa, that helps in absorption and secretion

SUBMUCOSA

- Consists of dense connective tissue rich in collagen and elastic fibres.
- Contain numerous blood vessels, lymphatics and nerve fibres and *Meissner's plexus*.
- It also contains *glands (oesophagus and duodenum)*

MUSCLE LAYER

- 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*

Between the two layers “*Auerbach’s plexus* (*Myenteric plexus*)” is present.

This plexus controls *motility* of tract.

SEROSA /ADVENTITIA

- It is merely *visceral 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 in neck to the stomach in abdomen.
- **MUCOSA:**
 - Epithelium:* Non-Keratinised stratified squamous epithelium
 - Lamina Propria:* Thin layer of loose connective tissue.
 - Muscularis Mucosae:*
 - It is *thicker* than other parts of GIT
 - It is single layer of *longitudinally* running smooth muscle fibres.

- **SUBMUCOSA:**

- It is a wide layer of, dense connective tissue composed of bundles of collagen and elastic fibres.
- Due to elastic fibres, submucosa is thrown into folds, hence lumen of oesophagus appears *star shaped*
- Contains blood vessels and branched tubulo-alveolar mucous glands

- **MUSCLE LAYER**

- Arranged in two layers:

- Inner layer: *Circular*
- Outer layer: *Longitudinal*

* Between the two layers – *Myenteric plexus of nerve fibre and ganglion cells* are present. It controls *peristaltic* movement.

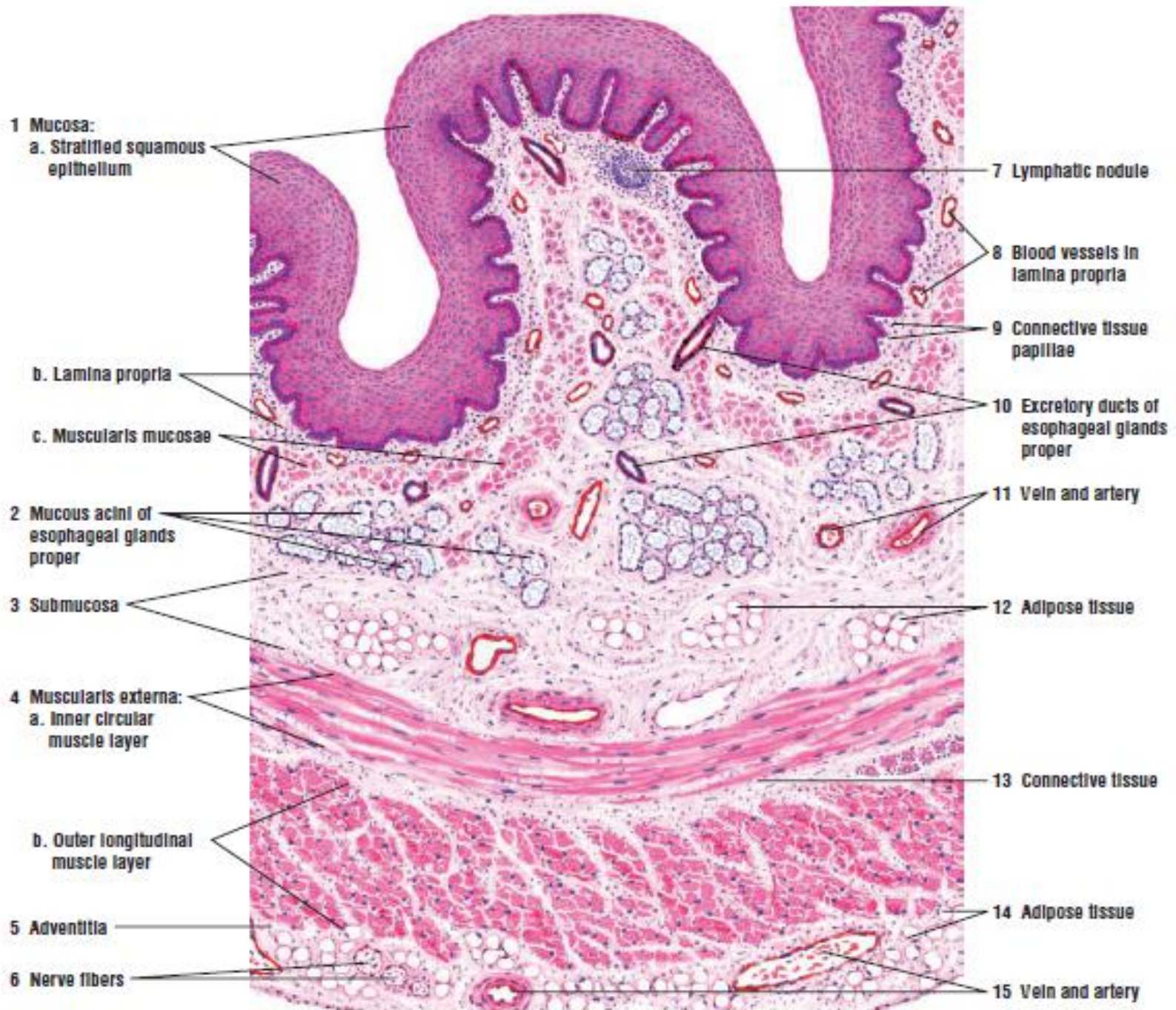
TYPES OF MUSCLES:

Upper 1/3rd – Skeletal muscle

Middle 1/3rd – Both skeletal and smooth muscle

Lower 1/3rd – purely smooth muscle

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



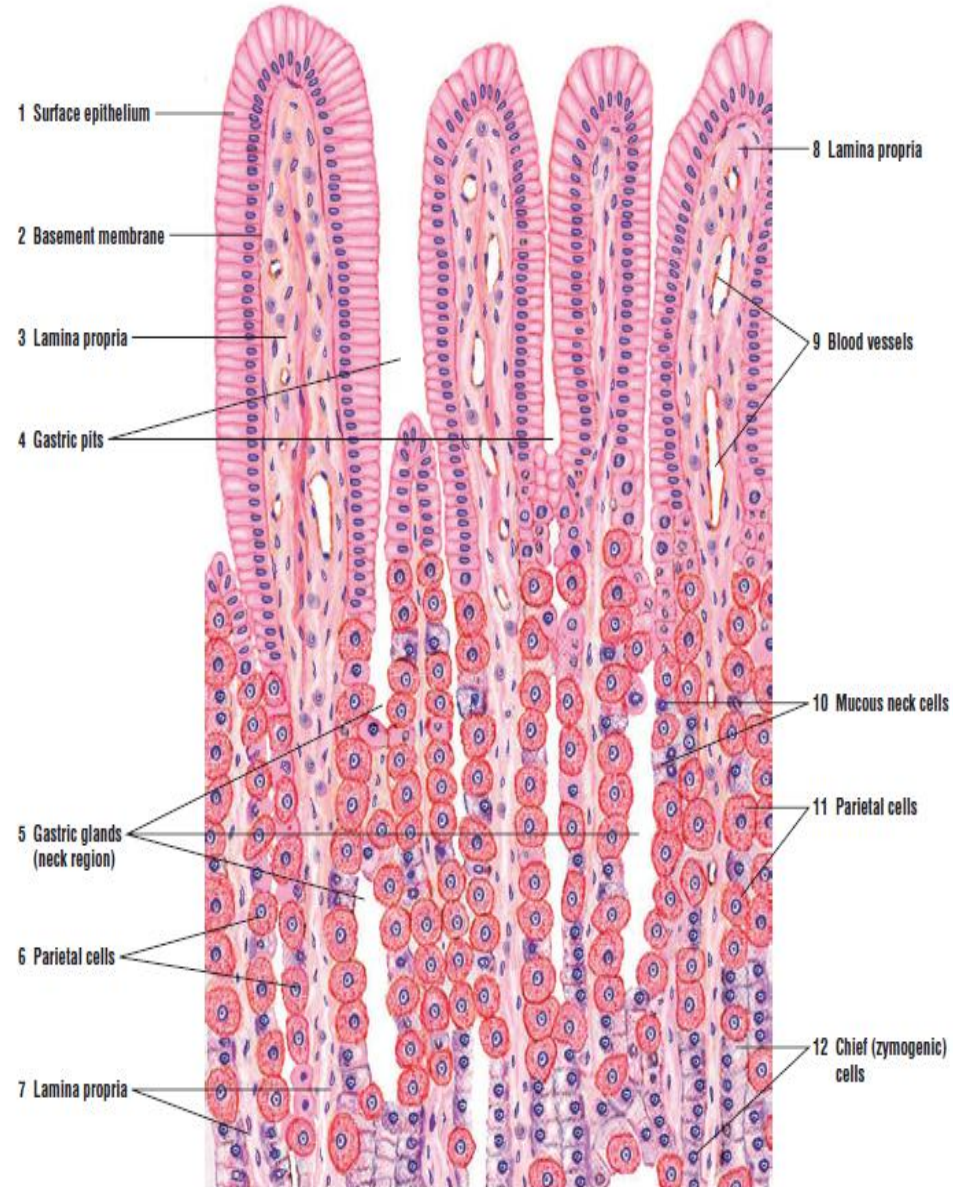
HISTOLOGY OF STOMACH

INTRODUCTION

- On the basis of histological structure, stomach is divided into three region:—
- i) Cardiac region
- ii) Fundic(or body) region
- iii) Pyloric region
- **The stomach wall exhibits four general regions:--**
- **Mucosa**— *a) Lining epithelium, b) Lamina propria, c) Muscularis mucosae*
- **Submucosa**
- **Muscle layer** and
- **Serosa** .

FUNDIC OR BODY REGION

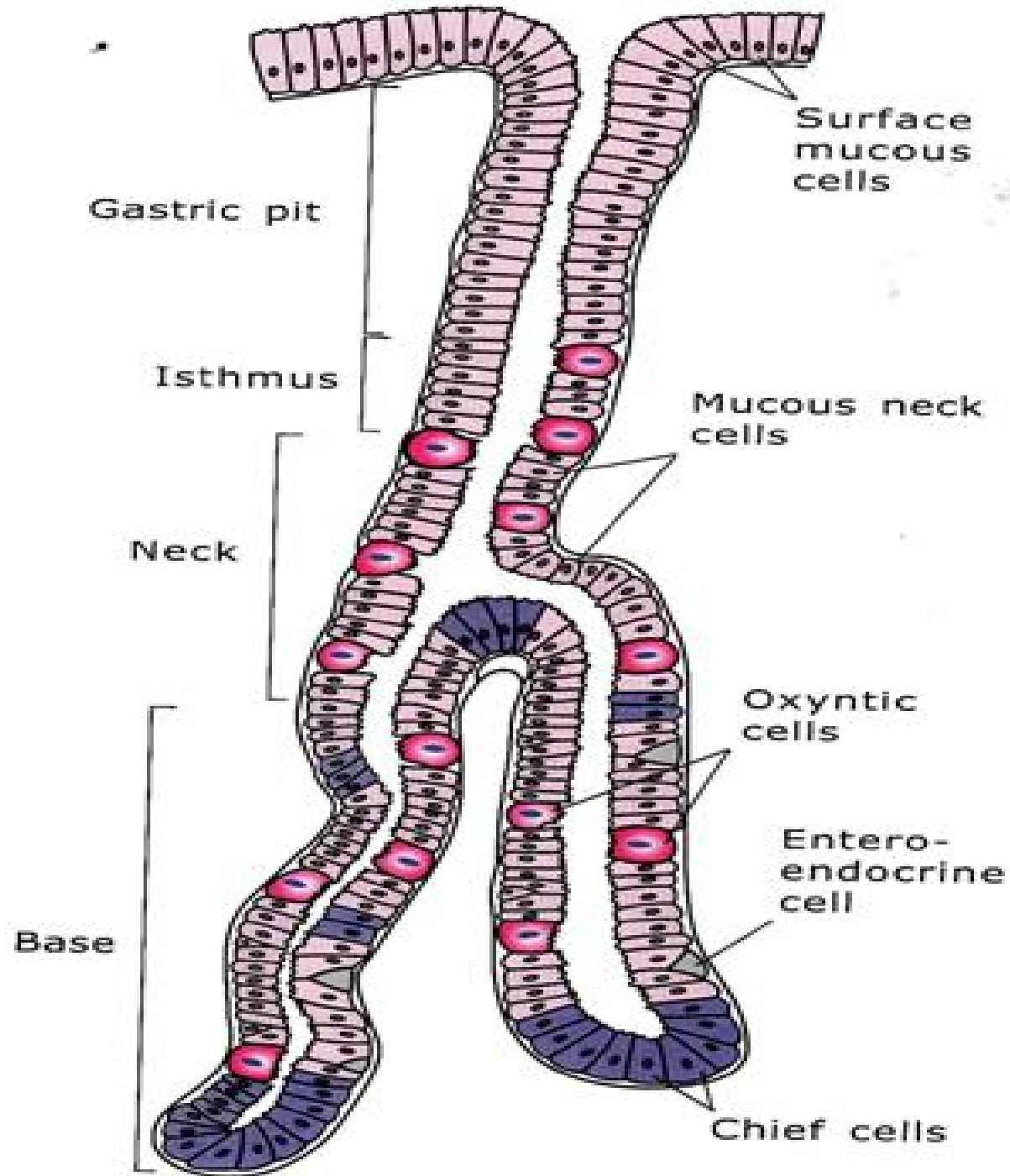
- **Mucosa**
- **a) Lining epithelium**
- **Simple columnar epithelium** that invaginates to various extents into the lamina propria, forming **gastric pits**.
- These cells are involved in **mucus secretion**. The mucus **protects** the epithelial lining from damage due to the presence of acid in the stomach.



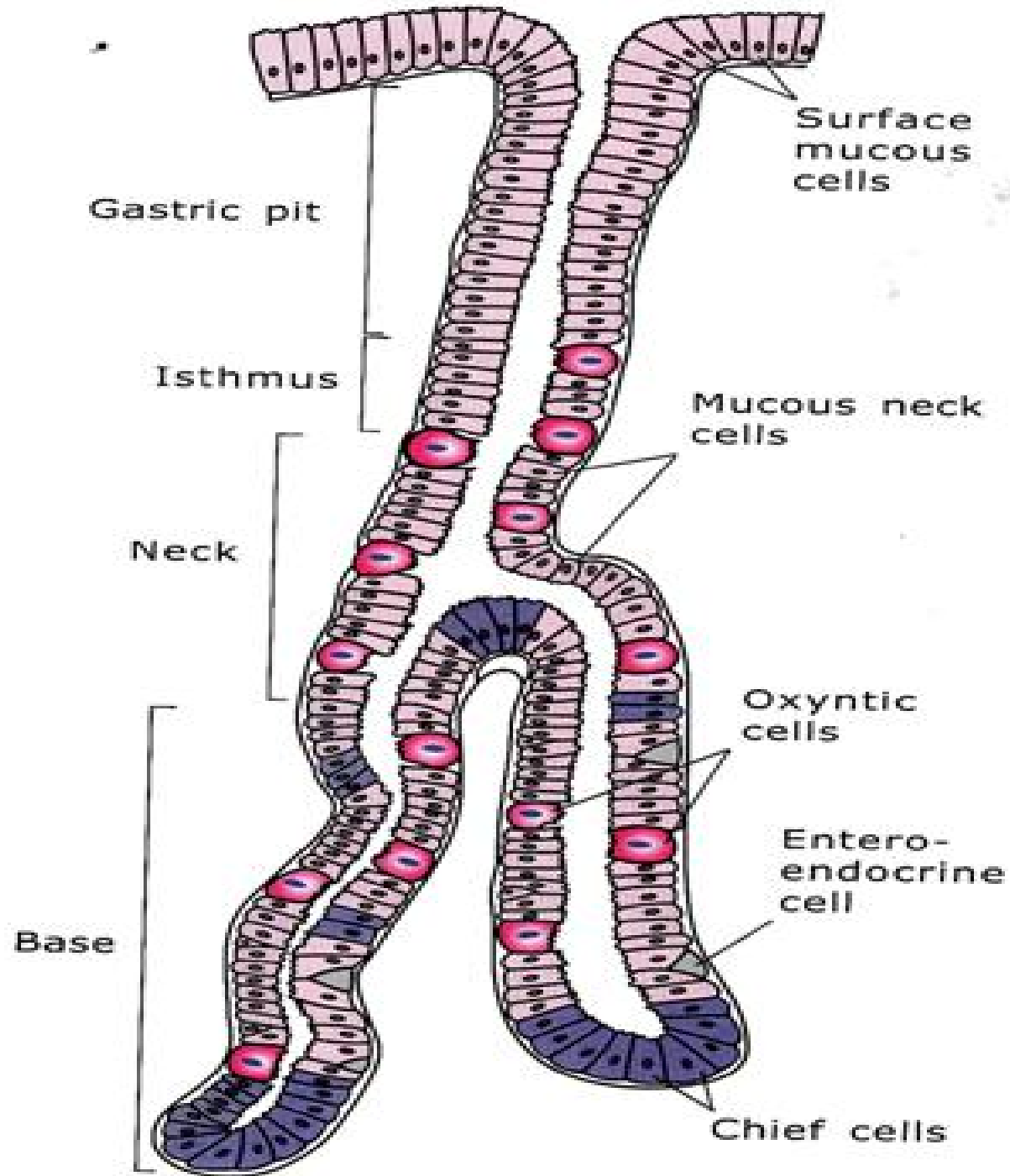
- **b) Lamina propria—**
- Small *tubular fundic/gastric glands* are present.

Types of cells:

- i) Mucous neck cells* – Located *just below* gastric pit.
 - Columnar in shape
 - Contain *mucinogen*
 - Produces *soluble mucus*



- **Parietal or oxyntic cells:**
- Large ,rounded or pyramidal in shape
- Found in *upper half* of gastric gland.
- *Secretes HCL* and **intrinsic factor**. Intrinsic factor combines with vitamin B12
- **Chief or zymogenic cells:**
- - Located in the *lower 1/3rd* of gastric glands
- - *Secrete pepsinogen* which is converted into pepsin in an acid environment.



- **Enteroendocrine and APUD cells:**

- Located in the *basal portion* of gastric glands
- *Secrete serotonin, histamine and gastrin.*

These are endocrine cells which release their products into the blood vessels.

c)Mucularis mucosae—

It consists of two thin layer of smooth muscles.

Outer longitudinal

inner circular

SUBMUCOSA:

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

MUSCLE LAYER:

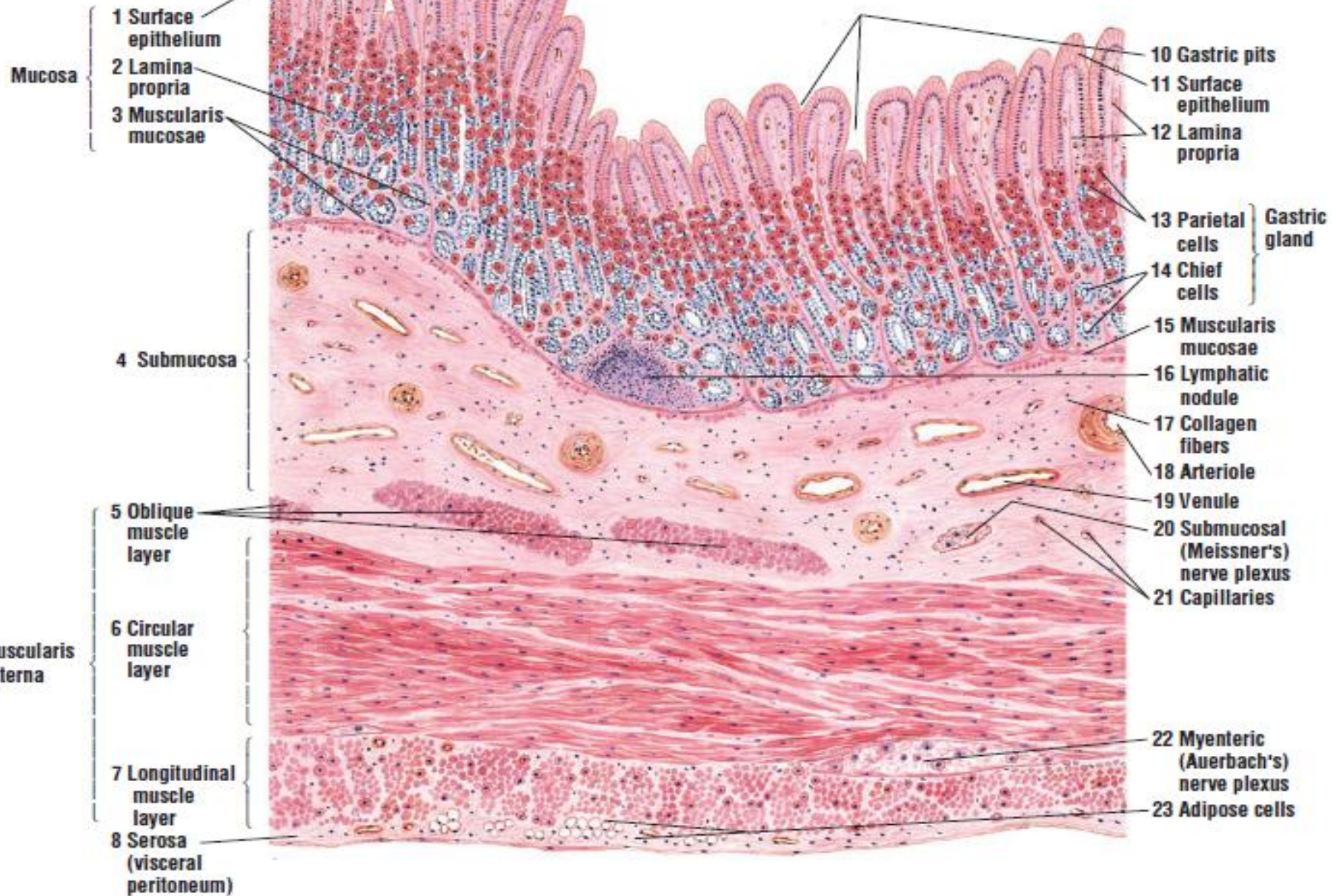
Inner: Oblique

Middle: circular

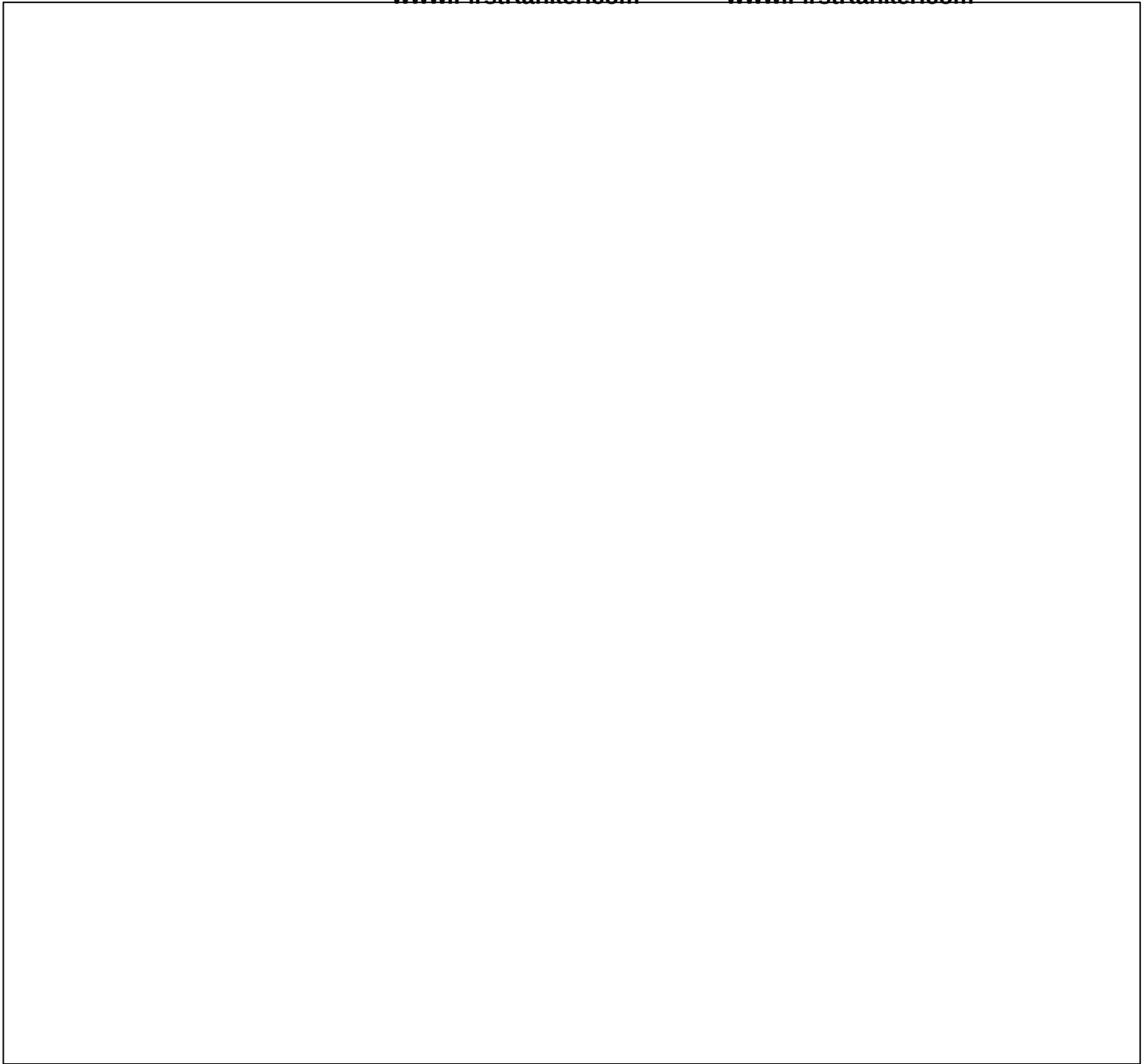
Outer: Longitudinal

SEROSA:

Outermost layers which consists of loose connective tissue covered by mesothelium



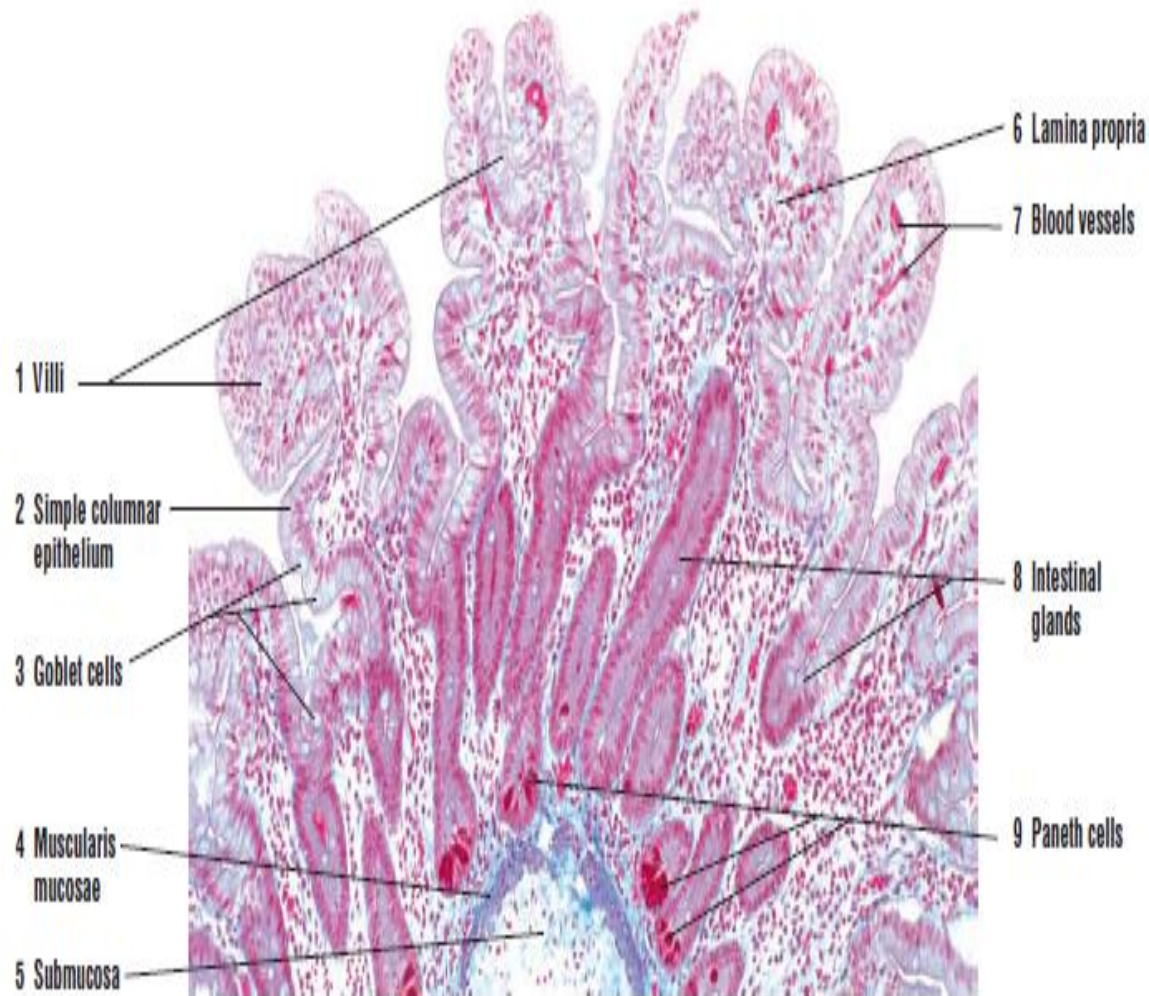
DUODENUM



- **Mucosa—villi** (*finger like mucosal projection*)
--Intestinal gland (crypts of lieberkuhn)
- **Submucosa—Duodenal gland (Brunner's gland)** present
- Secrete **alkaline mucus** that protect the mucosa from acid secreted by stomach.
- Also secretes **human epidermal growth factor** (which decreases HCL sec).

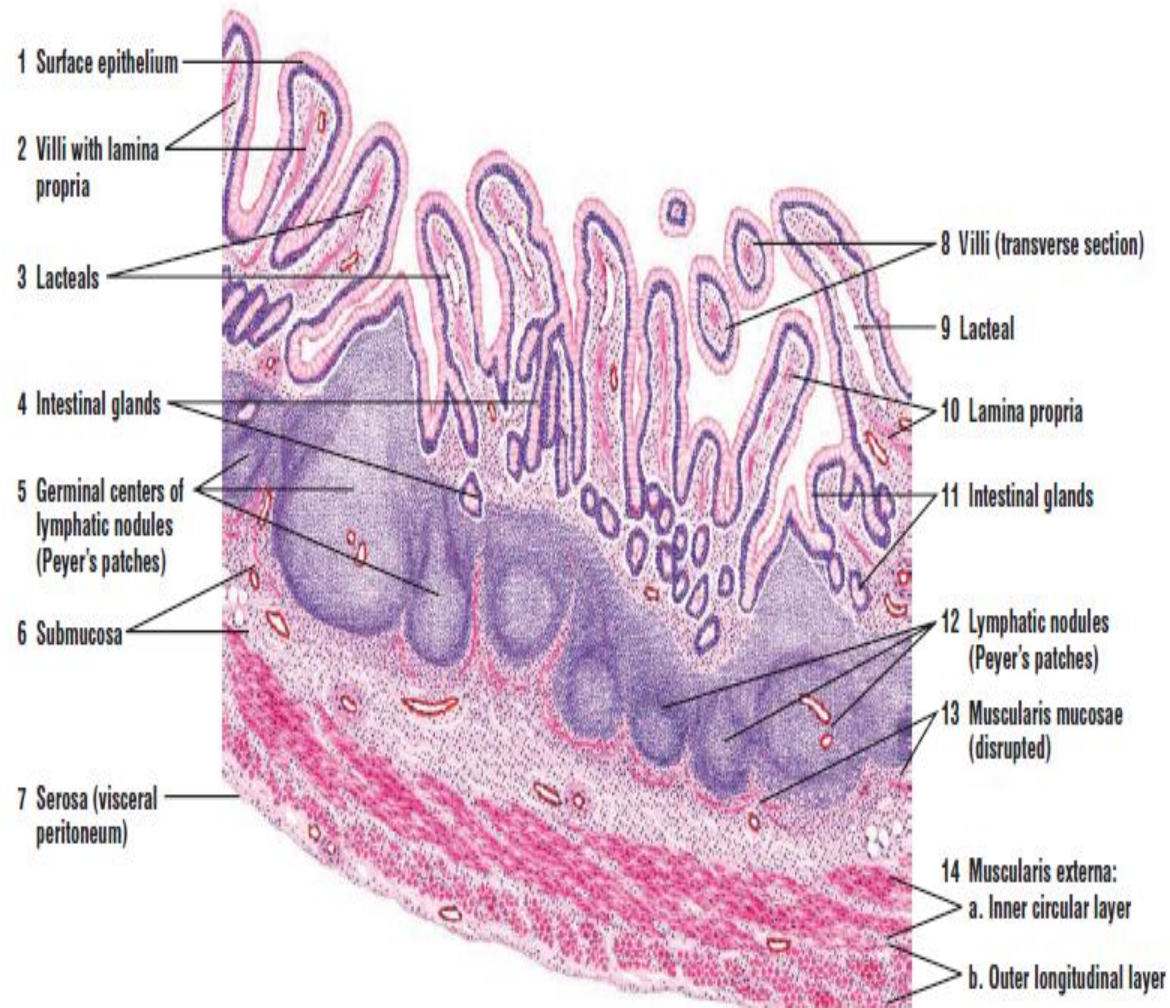
JEJUNUM

- *Villi are tongue shaped and long*
- *Absence of Brunner's glands.*



ILEUM

- Presence of lymphoid aggregations in *lamina propria* known as **Peyer's patches**.
- Villi are short & finger like

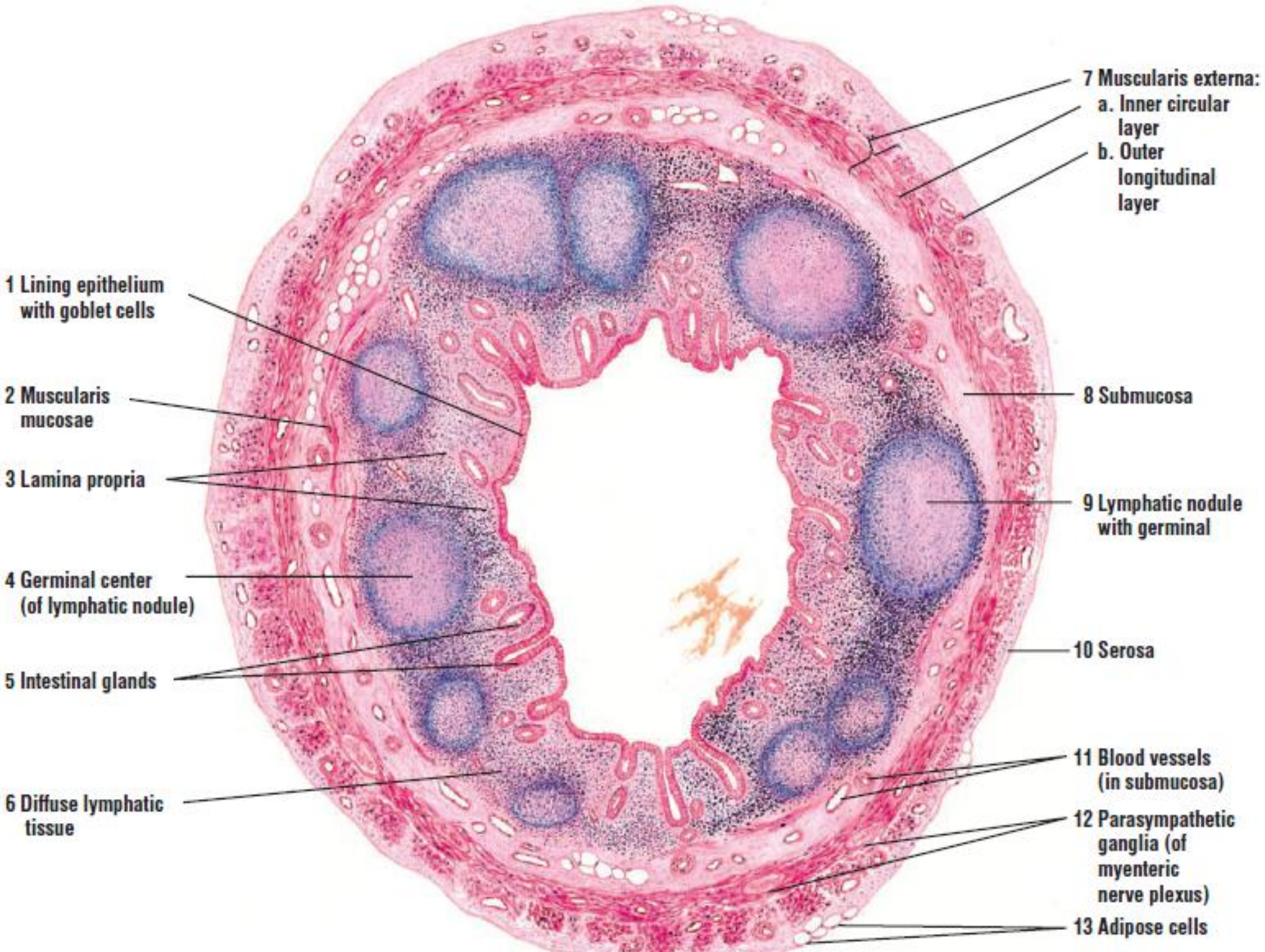


LARGE INTESTINE

- It consists of: appendix, colon, rectum and anal canal.
- **Mucosa:** ***Absence*** of Plicae circulares and villi
 - Presence of ***Microvilli***
 - Presence of ***Crypts of Lieberkuhn***
 - Presence of ***Goblet cells*** in large number
- **Submucosa**
- **Muscle layer:**
 - Inner circular layer - thin compared to small intestine.
 - Outer longitudinal layer- forms **Taenia coli**.
- **Adventitia:** **Appendices epiploicae** (peritoneum forms pouch like processes filled with fat)

APPENDIX

- A small blind-ending diverticulum.
- **Large accumulations of lymphoid tissue** in *lamina propria* which may extend into *submucosa*.
- ***Intestinal villi are usually absent.***
- ***Crypts are poorly formed.***
- Muscularis externa is ***thin.***
- ***Absence of taenia coli.***





Thank you