

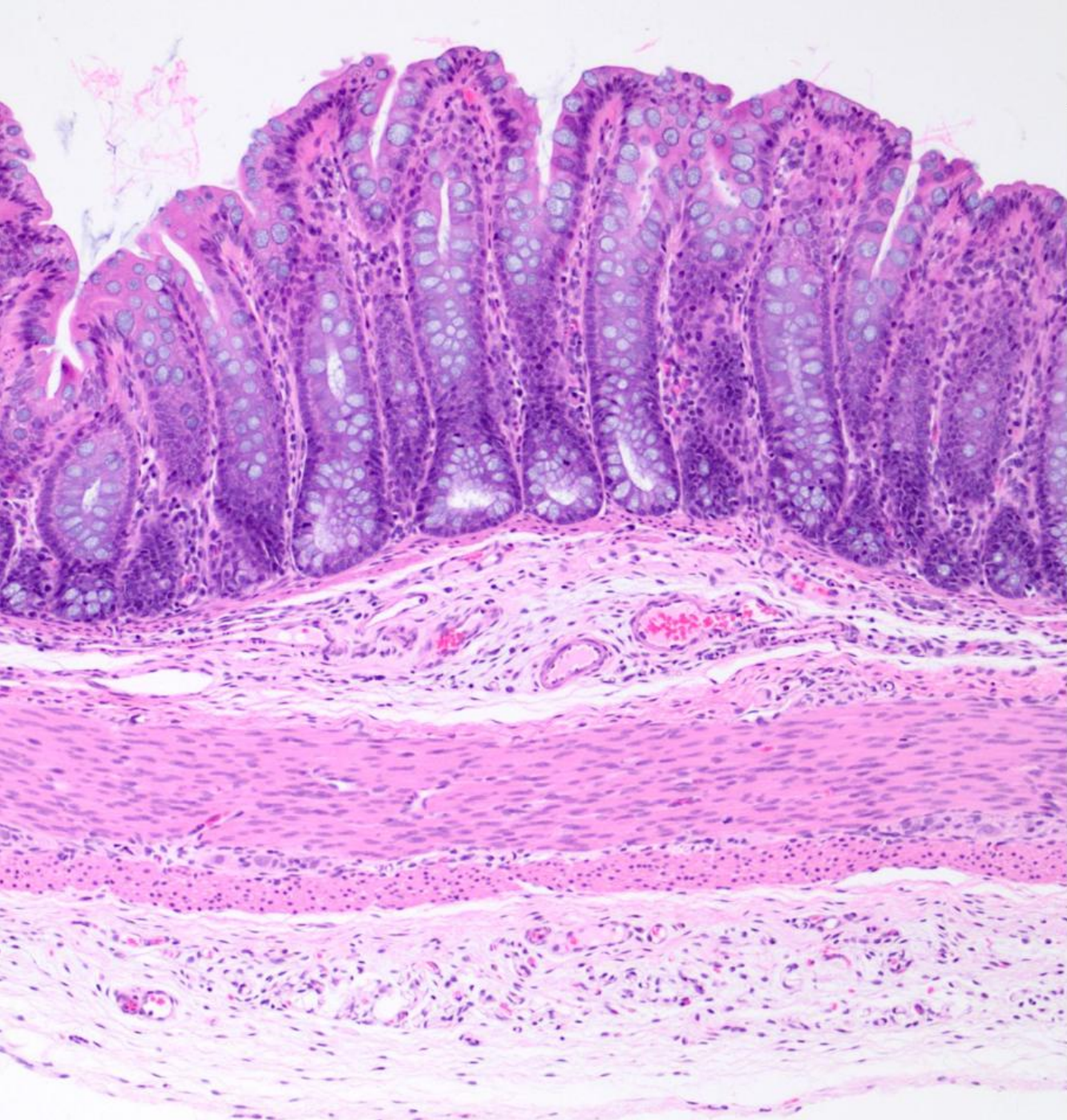
# MICROSCOPIC ANATOMY OF THE DIGESTIVE SYSTEM::

1) STOMACH

2) DUODENUM

3) ILEUM





# GENERAL ORGANIZATION OF THE GASTRIC WALL

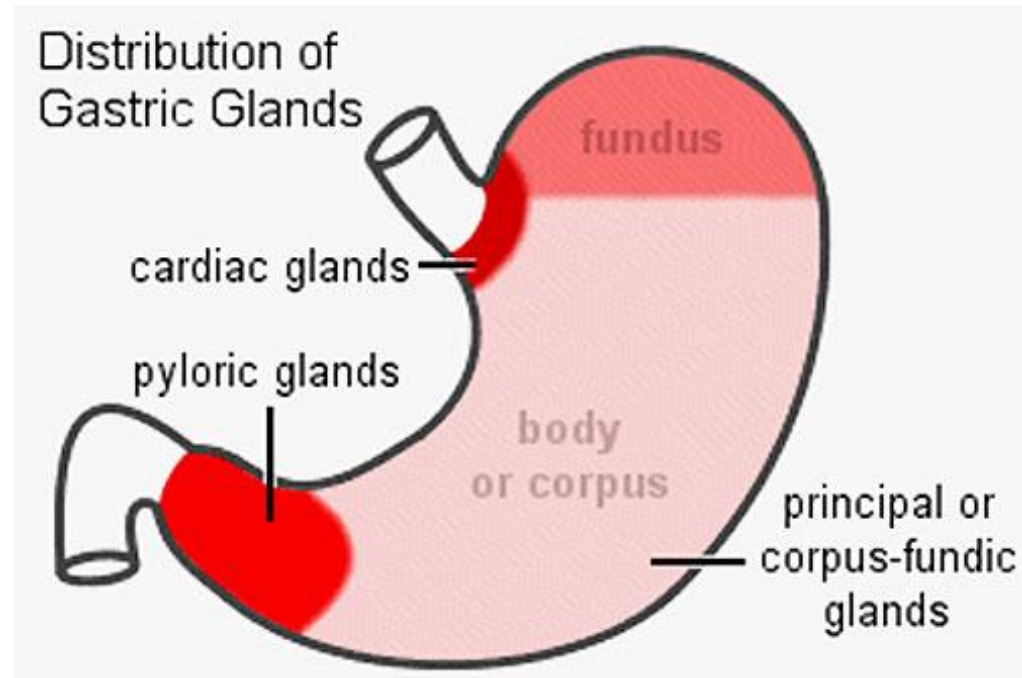
MUCOSAL LAYER (TUNICA MUCOSA)

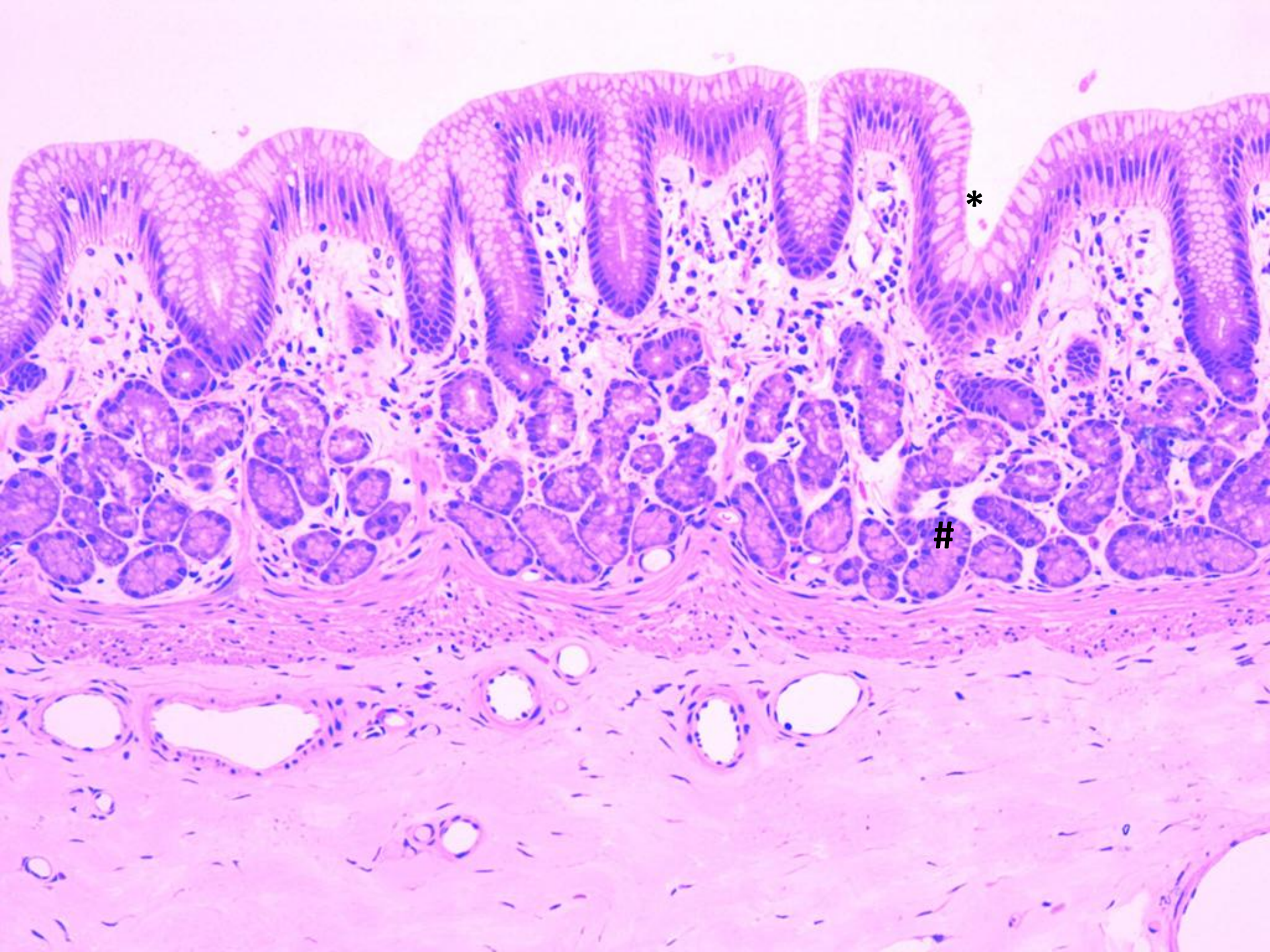
SUBMUCOSAL LAYER (TUNICA SUBMUCOSA)

MUSCULAR LAYER (TUNICA MUSCULARIS)

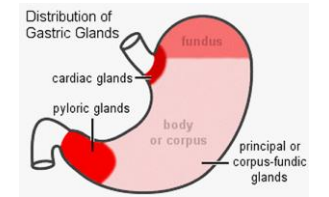
SEROSA

# MICROSCOPIC REGIONS OF THE GASTRIC MUCOSA



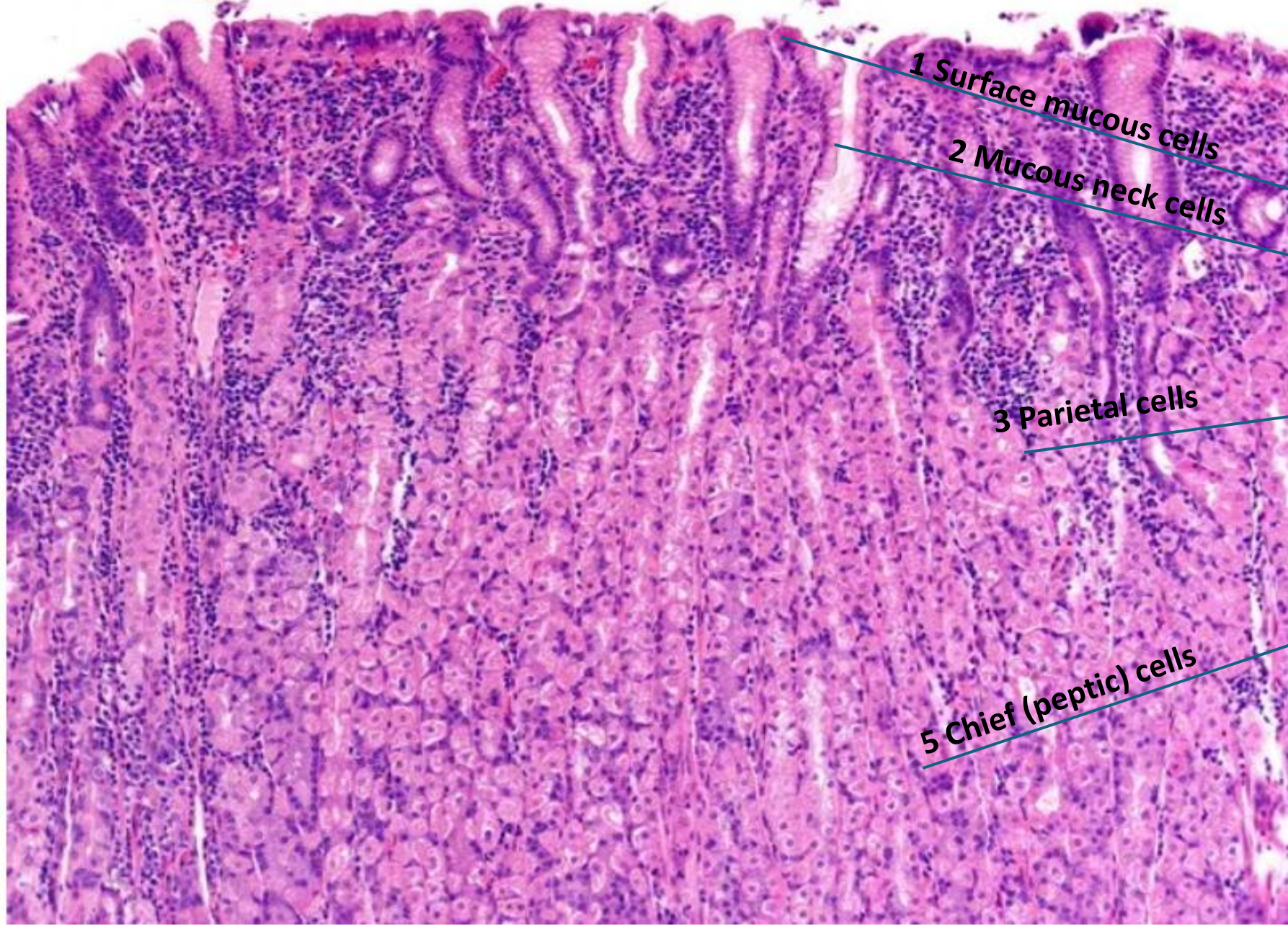


## CARDIAC REGION



# FUNDIC OR OSSINTIC REGION

©WebPathology

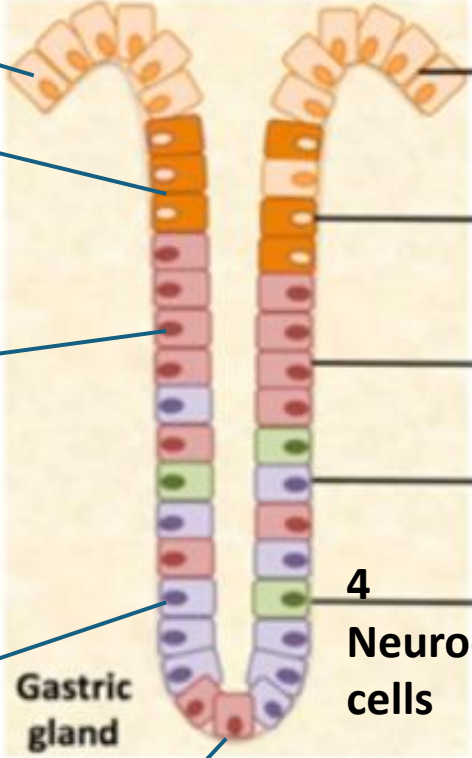
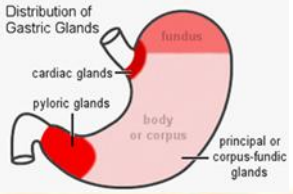


1 Surface mucous cells

2 Mucous neck cells

3 Parietal cells

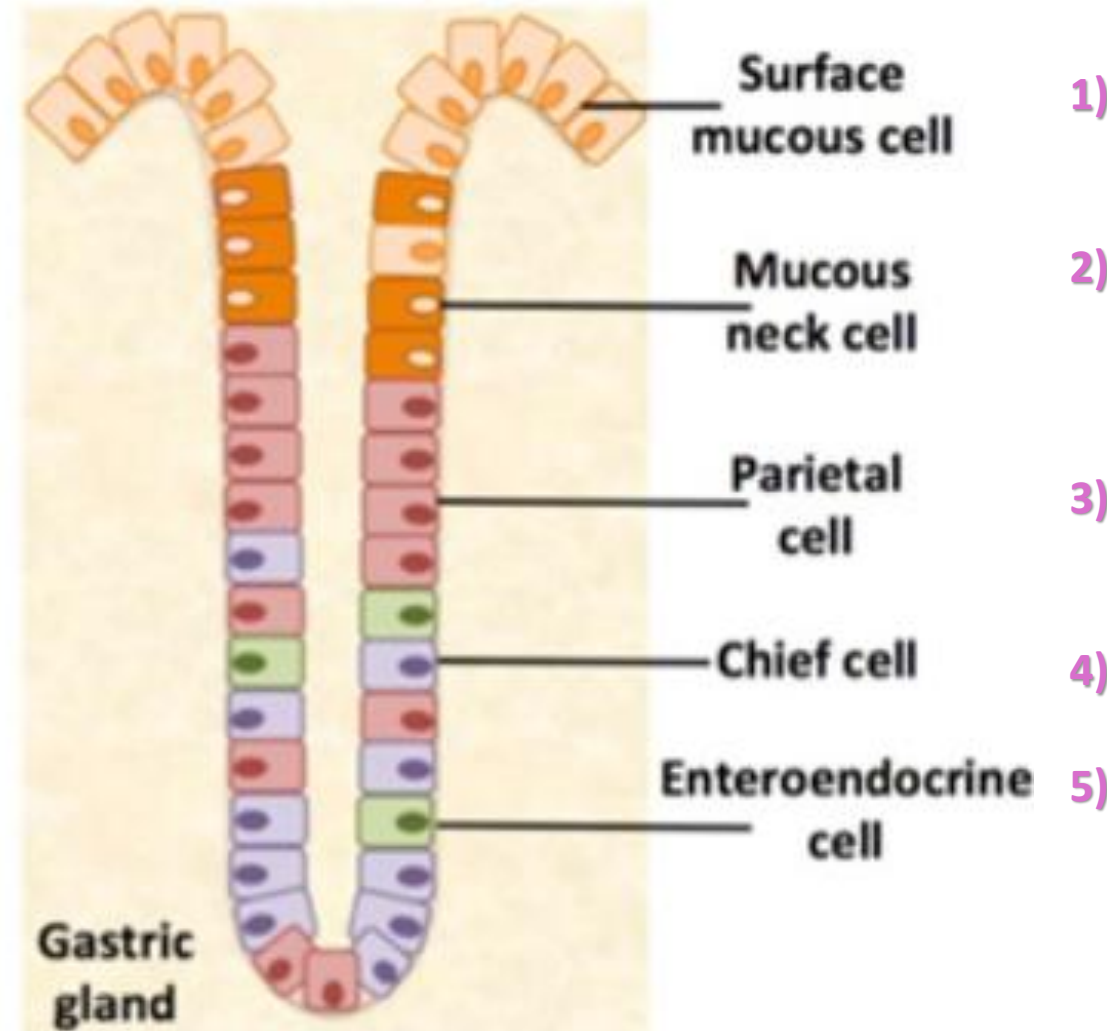
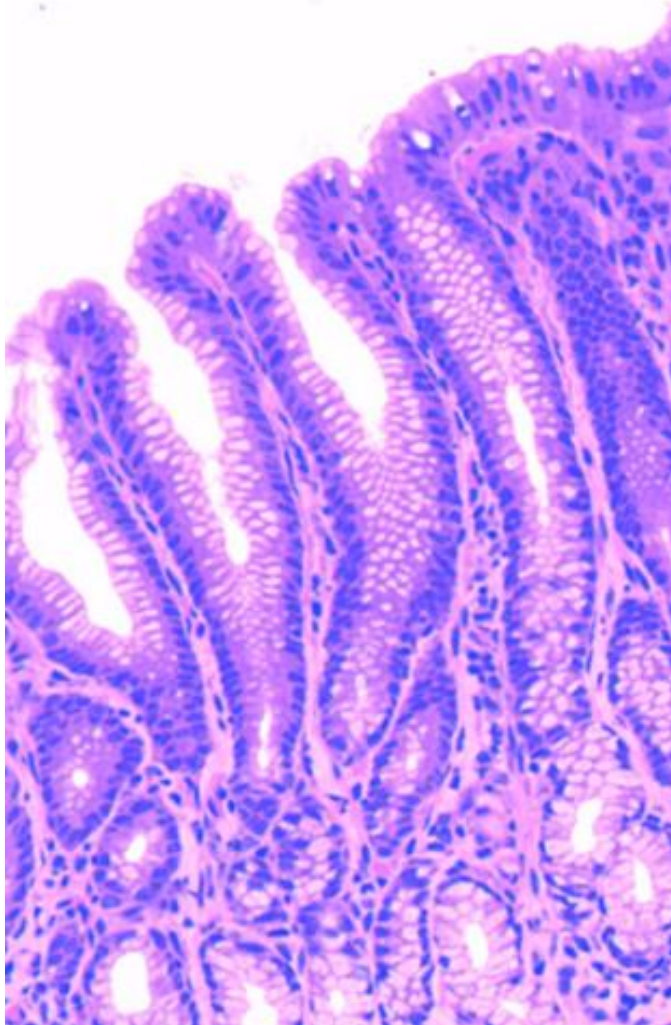
5 Chief (peptic) cells



4 Neuroendocrine cells

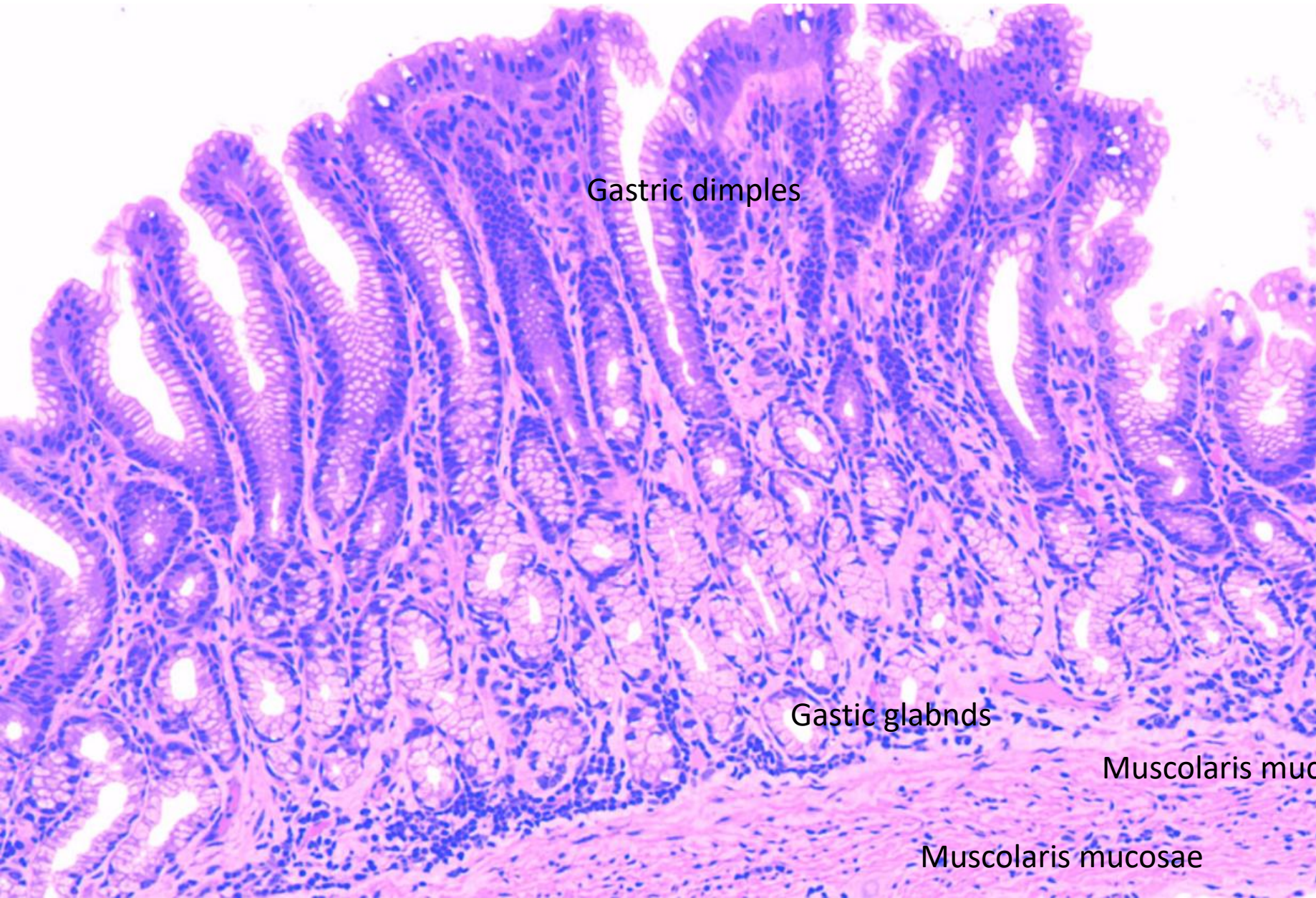
6 Stem cells

# SECRETIONS OF THE CELLS OF THE FUNDIC GLANDS



*Neuroendocrine cells are difficult to observe in routine H&E sections, and stem cells are even more difficult to identify..*

# PILORIC REGION

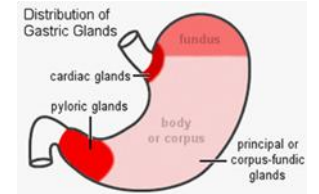


Gastric dimples

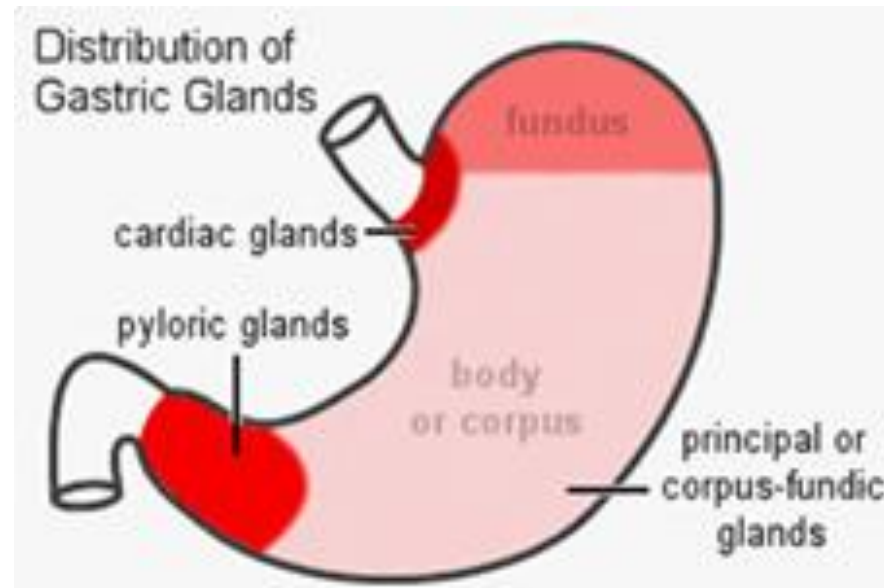
Gastric glands

Muscularis mucosae

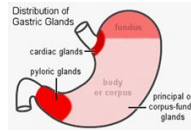
Muscularis mucosae



# SUMMARY OF THE THREE HISTOLOGICAL REGIONS OF THE STOMACH



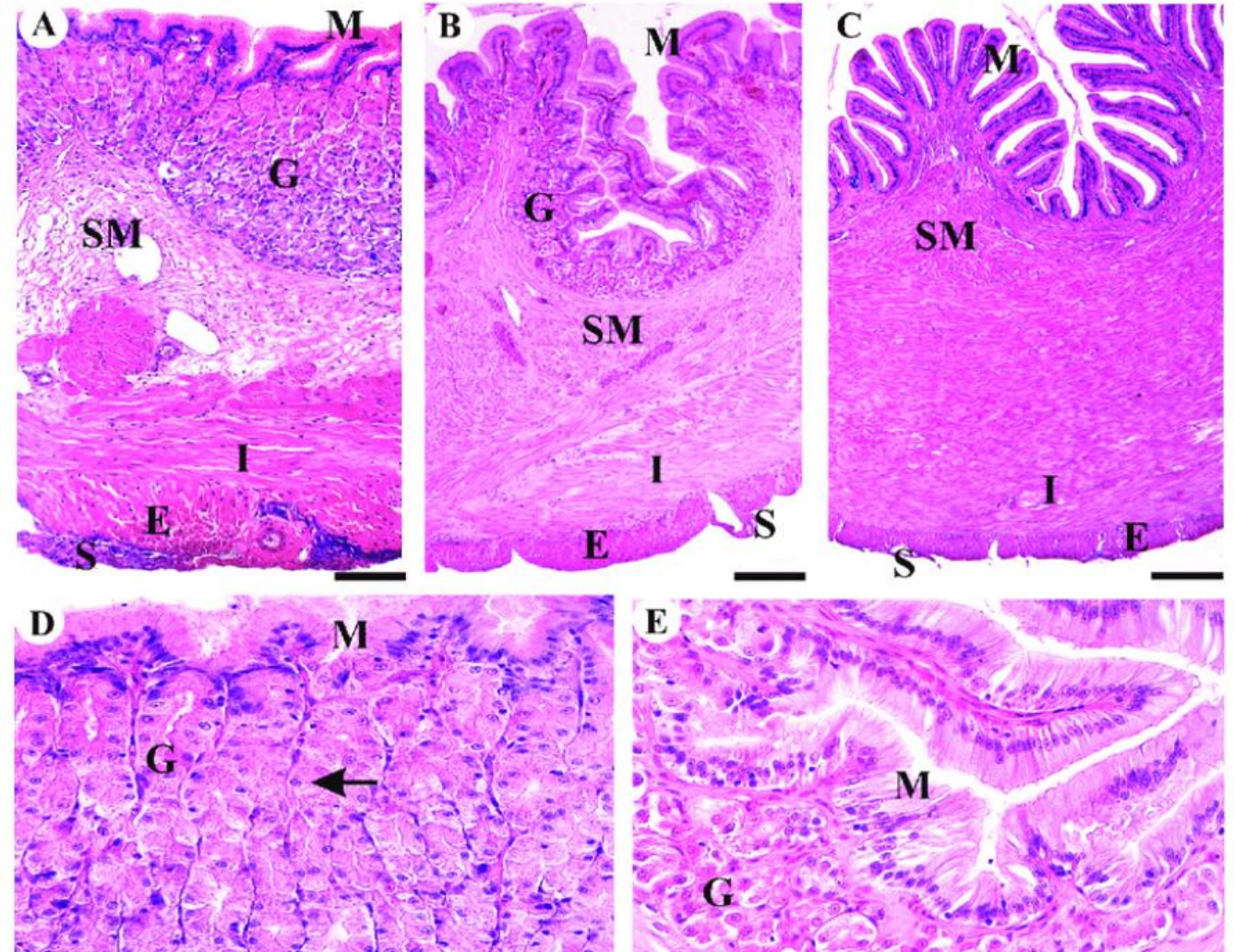
# SUMMARY OF THE THREE HISTOLOGICAL REGIONS OF THE STOMACH



Histological differences explain functionality:

- **Abundance of PARIETAL CELLS** → acid secretion.
- **CHIEF CELLS** → protein digestion.
- **MUCOUS CELLS** → protection of the mucosa.
- **ENDOCRINE CELLS** → local and systemic regulation.

An important **structure–function correlation**, which will be further explored in the **Physiology module** (acid–peptic secretion, nervous and hormonal control, gastric motility).

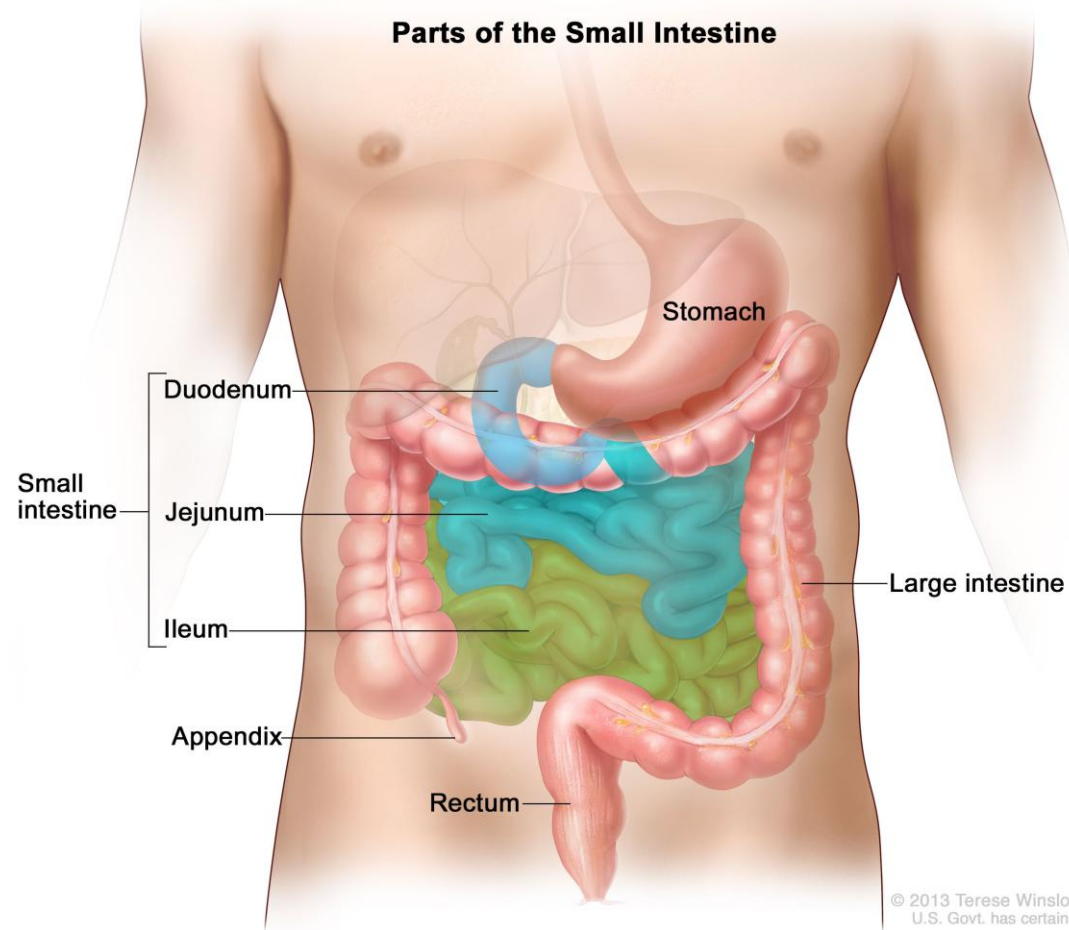


# MICROSCOPIC ANATOMY OF THE SMALL INTESTINE:

**Duodenum**

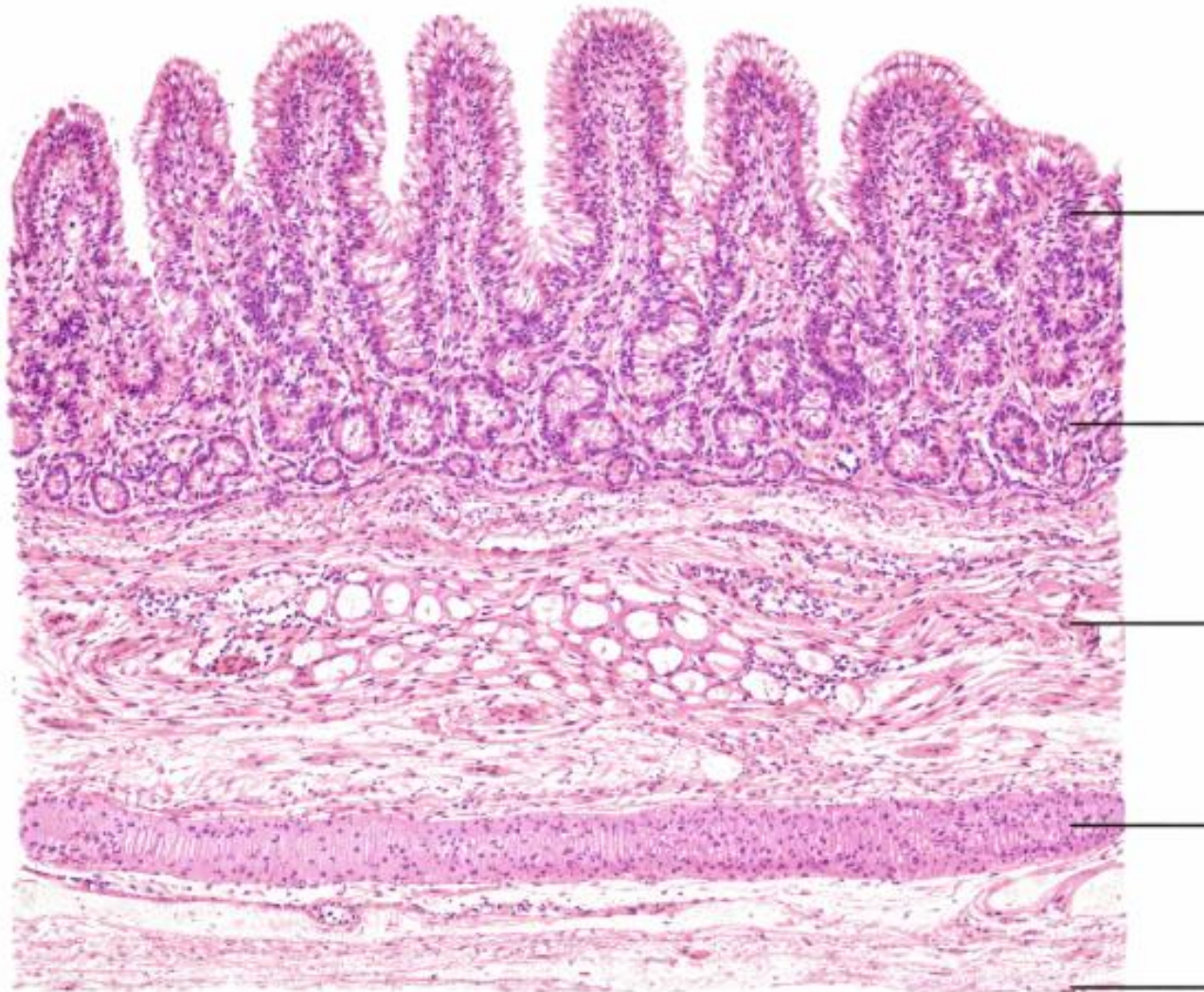
**Jejunum**

**Ileum**



**MICROSCOPIC ANATOMY OF THE SMALL INTESTINE**  
**duodenum**

The **DUODENUM** shows the typical **four-layer structure** of the gastrointestinal tract:



- Mucosa
- Submucosa
- Muscular layer
- (Tunica muscularis)
- Serosa / Adventitia

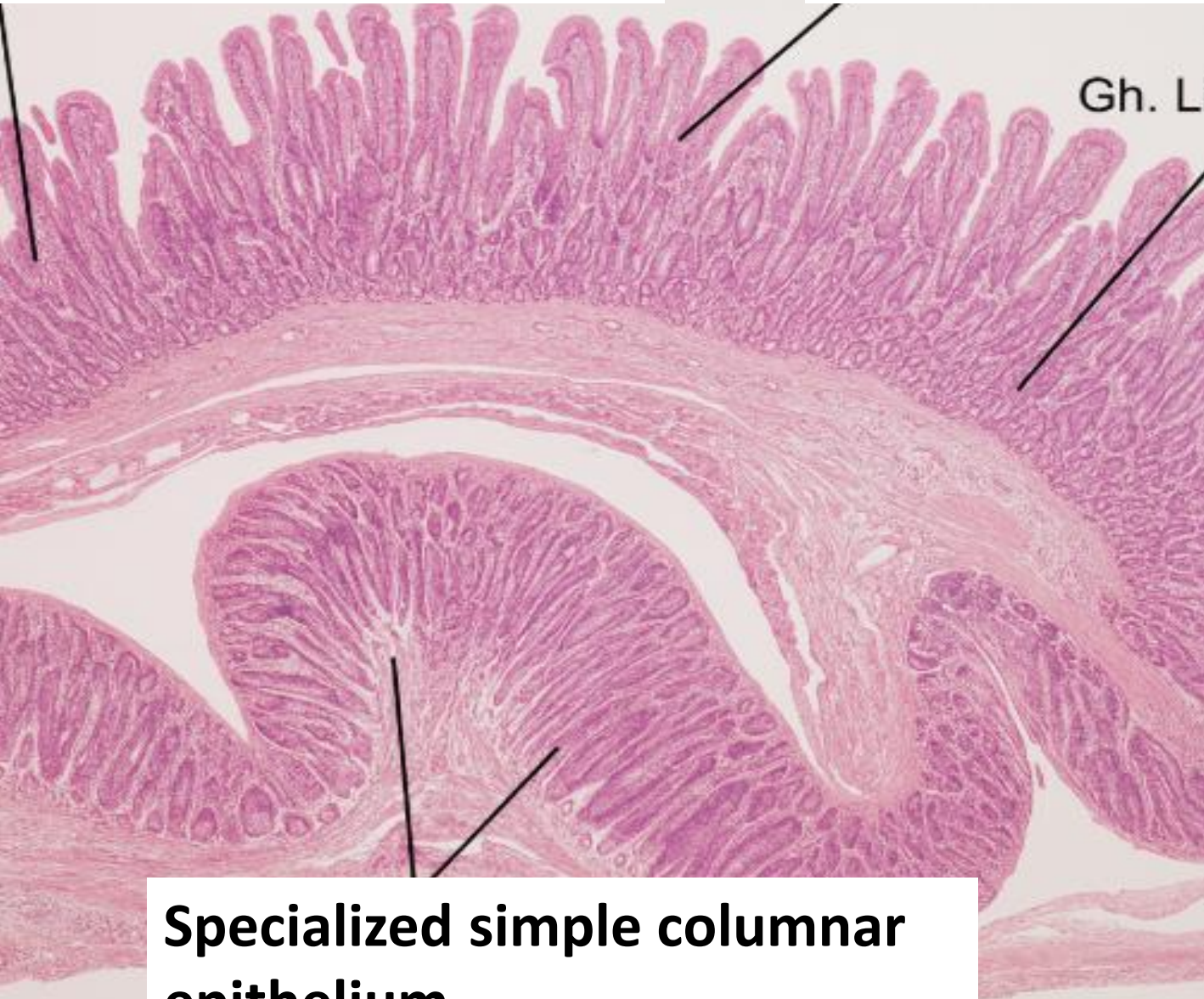
Circular folds (plicae of Kerckring)

Intestinal villi

Gh. Li

# DUODENAL MUCOSA

Specialized simple columnar  
epithelium



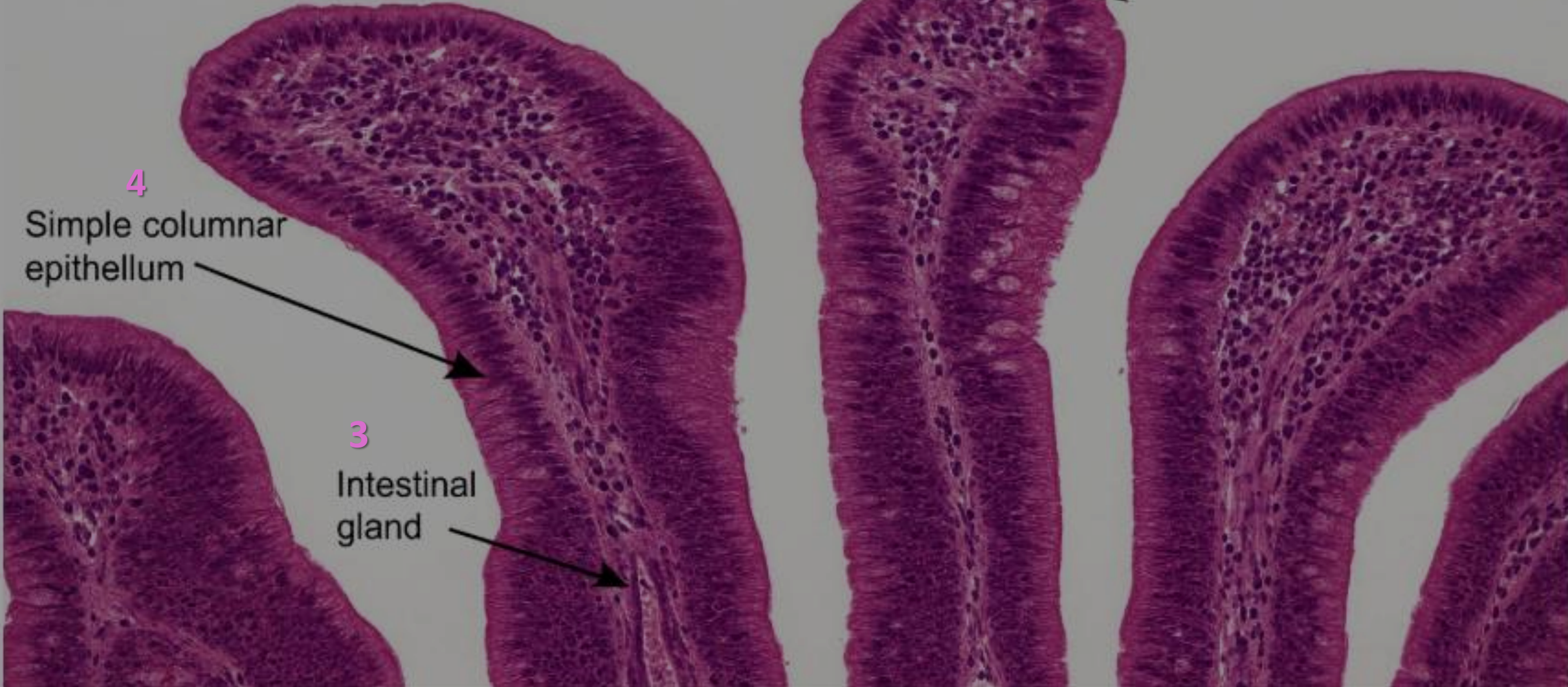
# DUODENAL MUCOSA

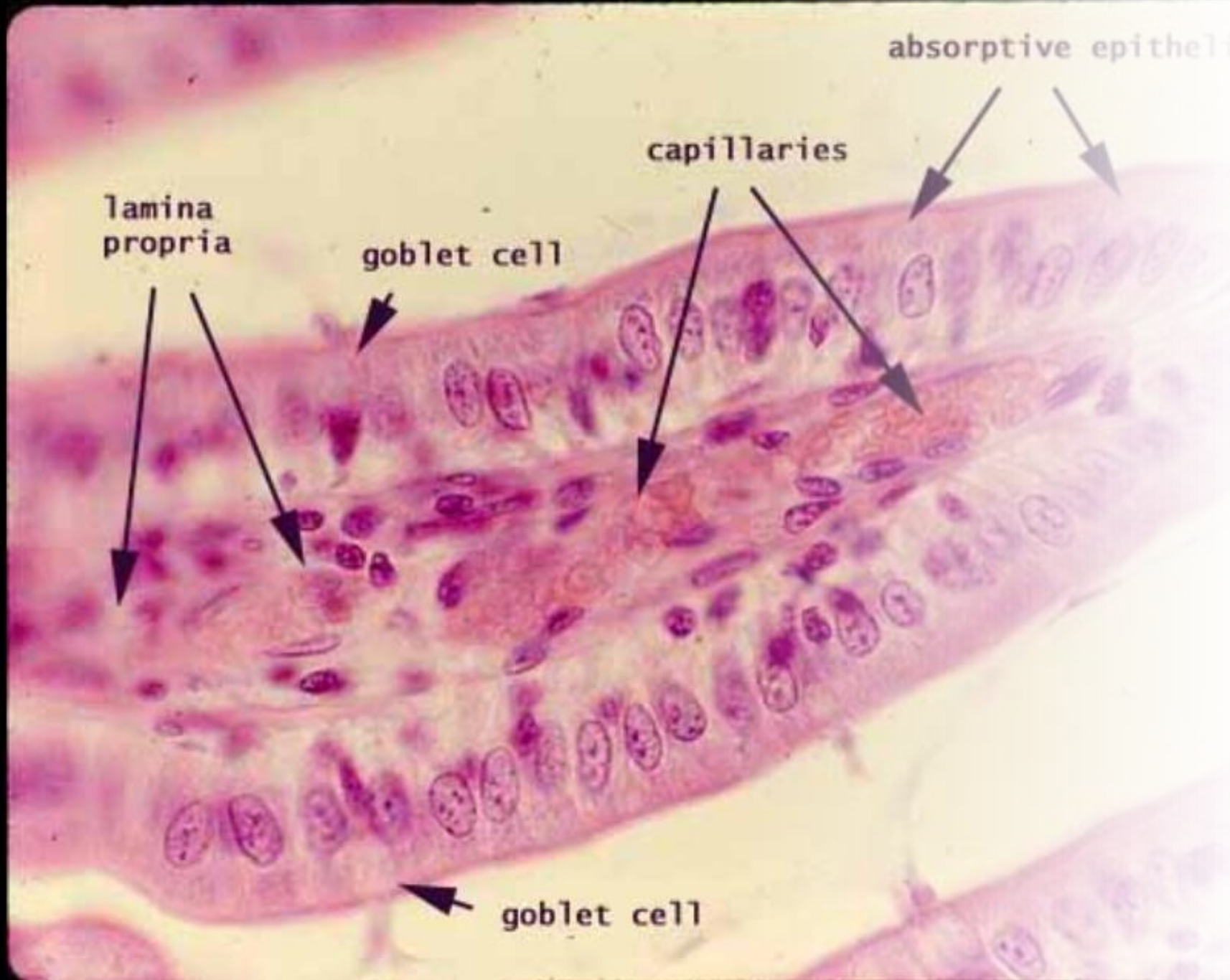
1 Circular folds (plicae circulares)  
– permanent, large

2 Intestinal villi

4 Simple columnar  
epithellum

3 Intestinal  
gland





### CELL TYPES OF THE EPITHELIUM: integrated function

#### Enterocytes

Columnar cells with a **brush border** (microvilli).

**Function:** terminal digestion and absorption of **monosaccharides, amino acids, and pre-emulsified lipids.**

#### Goblet cells

Produce **lubricating and protective mucus.**

Present in the duodenum but **less numerous than in the ileum.**

#### Paneth cells

Located at the **base of the crypts.**

Contain **eosinophilic granules** rich in **lysozyme** and  **$\alpha$ -defensins.**

Play an **immune role** in the regulation of the microbiota.

#### Enteroendocrine cells

Various populations (**S, I, K, L**, etc.), fundamental for the subsequent physiological discussion.

Produce **secretin, CCK, GIP**, and other hormones.

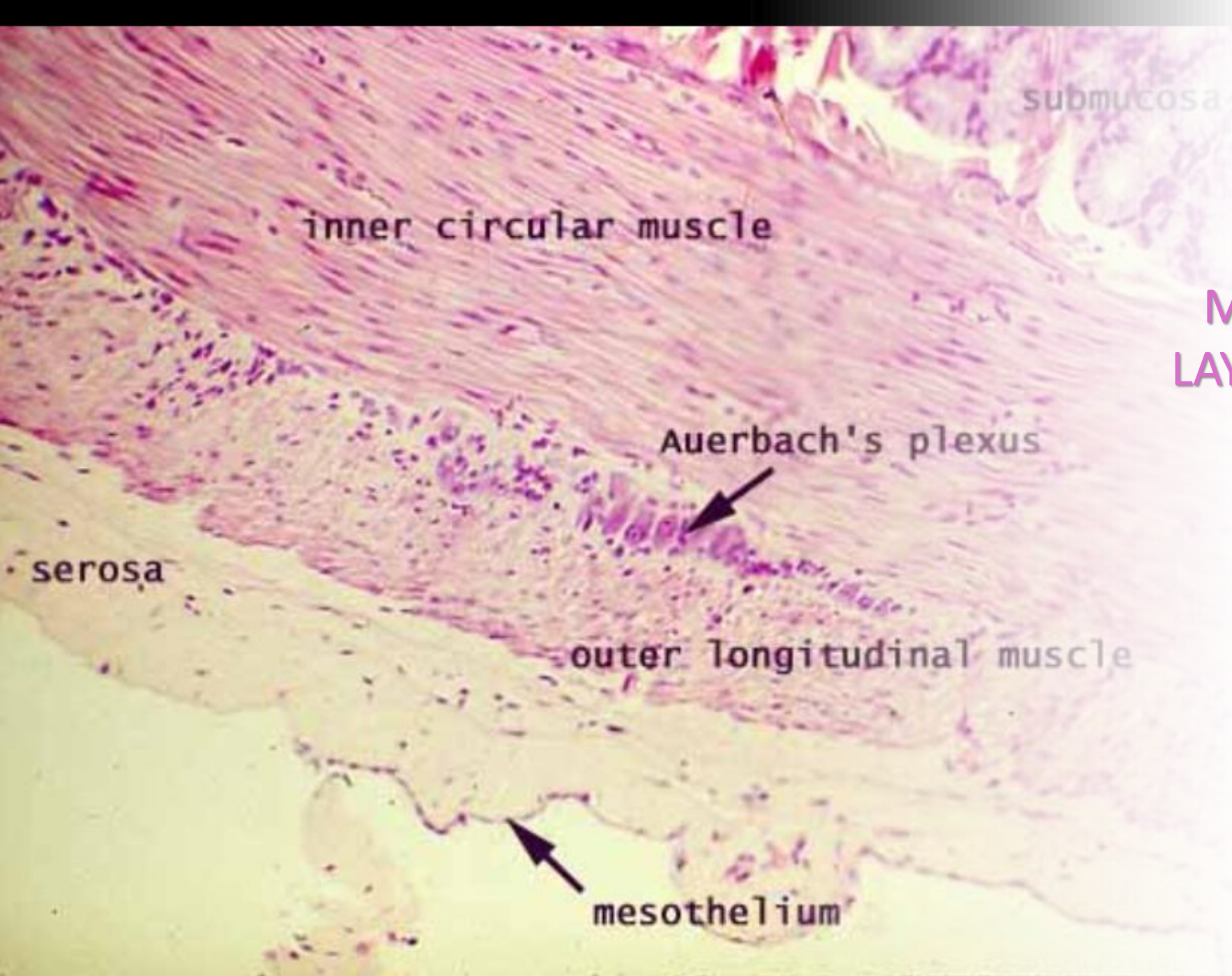
#### Intestinal stem cells

Located in the **crypts**; ensure rapid **epithelial turnover** (approximately **3–5 days**).

A histological section of the duodenum stained with hematoxylin and eosin (H&E). The image shows the mucosal layer with numerous Brunner's glands, which are large, coiled, and tubular glands. Each gland is composed of many acini, which are the secretory units of the gland. The acini are arranged in a circular or oval pattern, and their lumens are filled with secretory material. The glands are separated by connective tissue stroma. The overall appearance is that of a highly organized, glandular tissue.

Brunner's  
glands

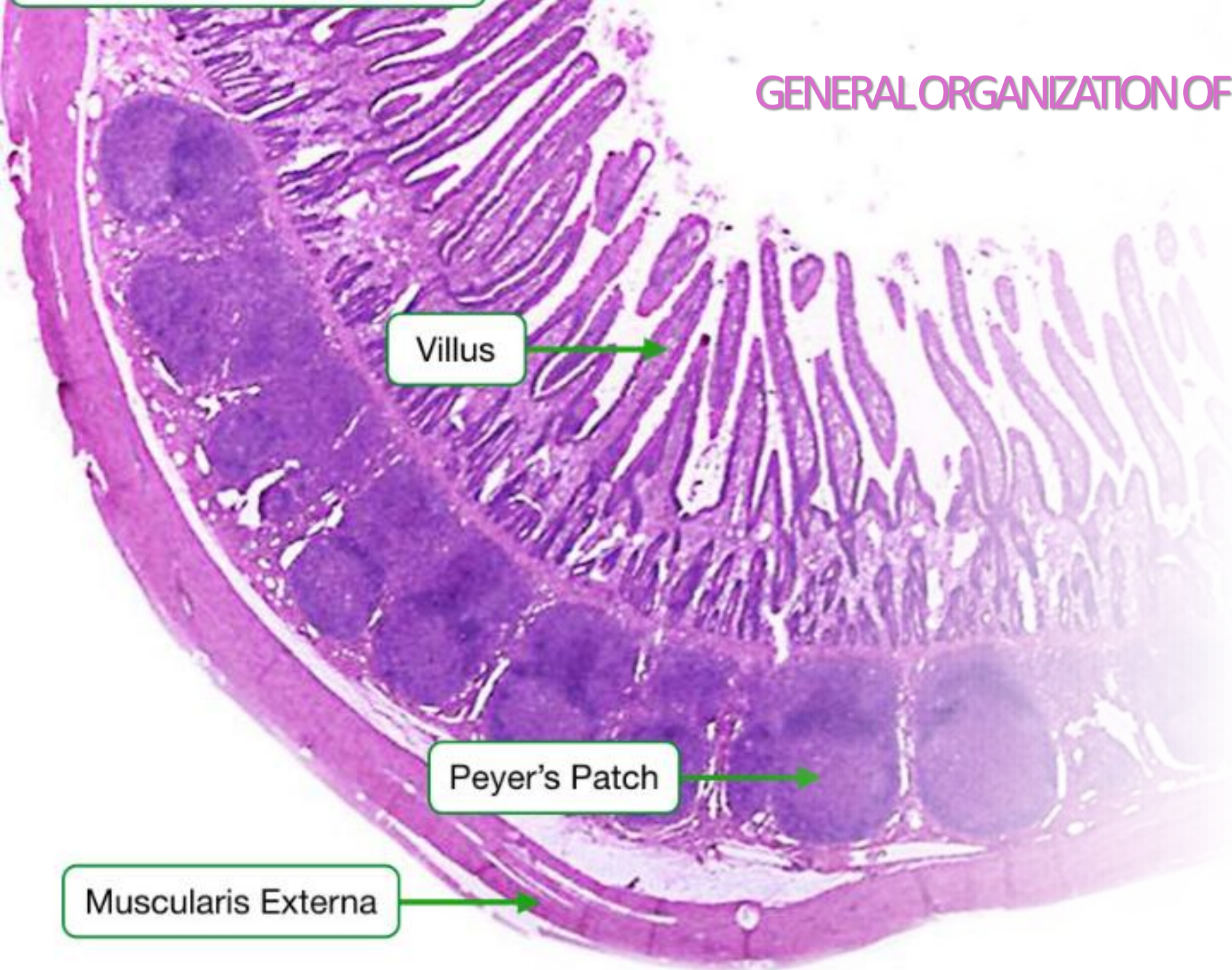
**DUODENAL  
SUBMUCOSA**



## MUSCULAR AND SEROUS LAYERS OF THE DUODENUM

- **TUNICA MUSCULARIS:**  
A Circular inner layer  
B Longitudinal outer layer
- **SEROSA**

## GENERAL ORGANIZATION OF THE ILEAL WALL



Villus

Peyer's Patch

Muscularis Externa

Epitelio cilindrico semplice

Goblet cell

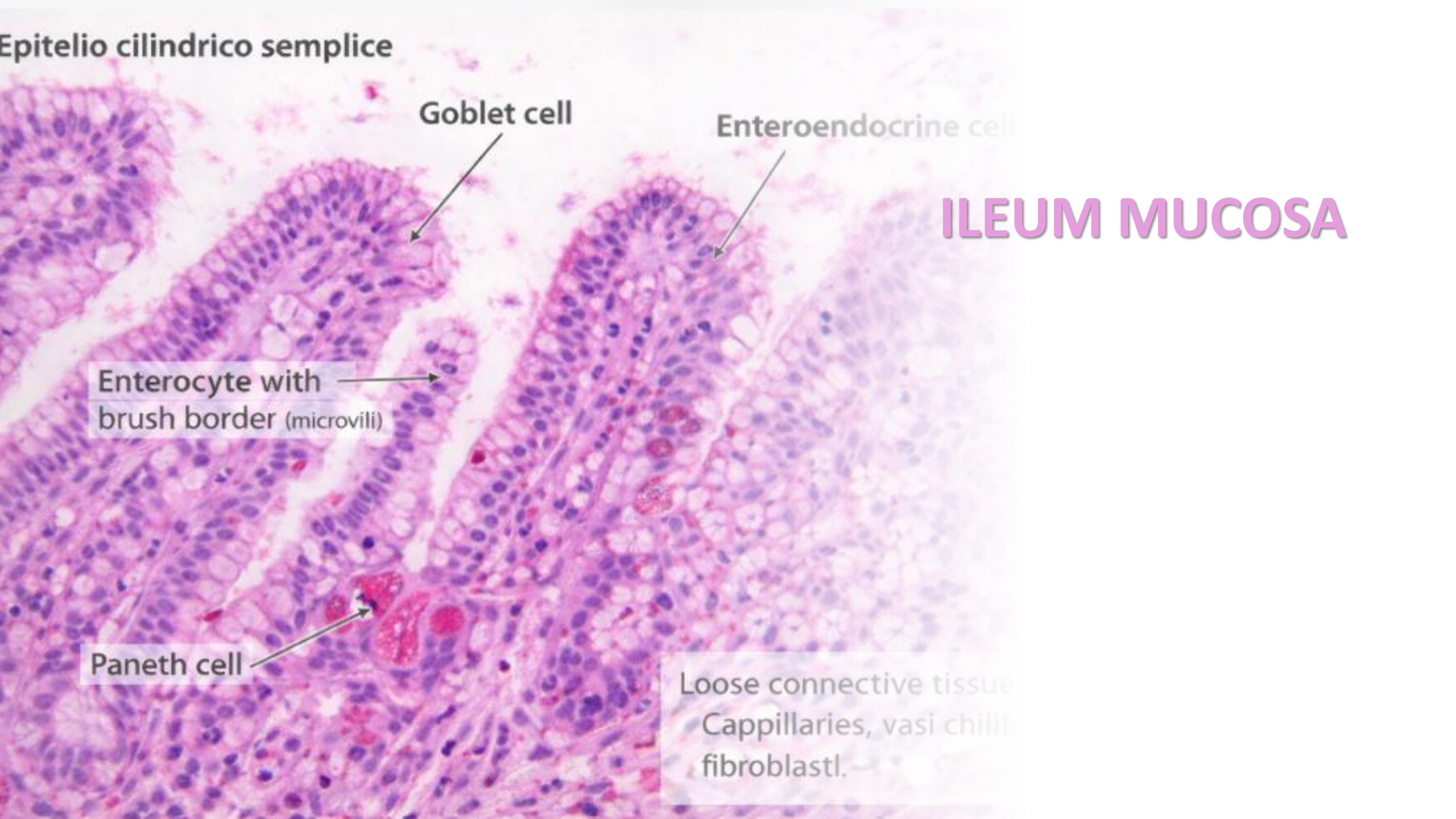
Enteroendocrine cell

# ILEUM MUCOSA

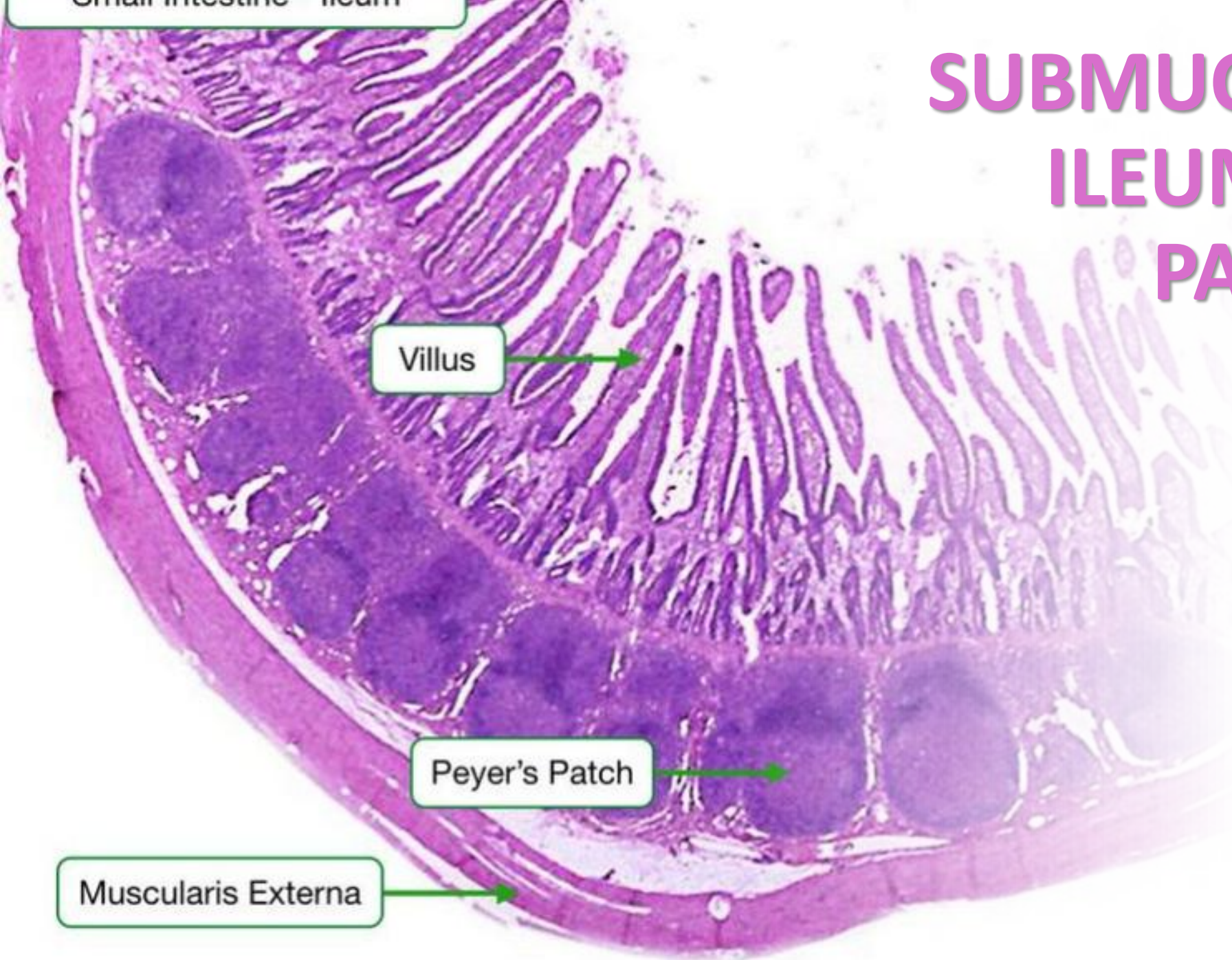
Enterocyte with  
brush border (microvili)

Paneth cell

Loose connective tissue  
Cappillaries, vasi chiliferi  
fibroblasti.



# SUBMUCOSA OF THE ILEUM PEYER'S PATCHES



Villus

Peyer's Patch

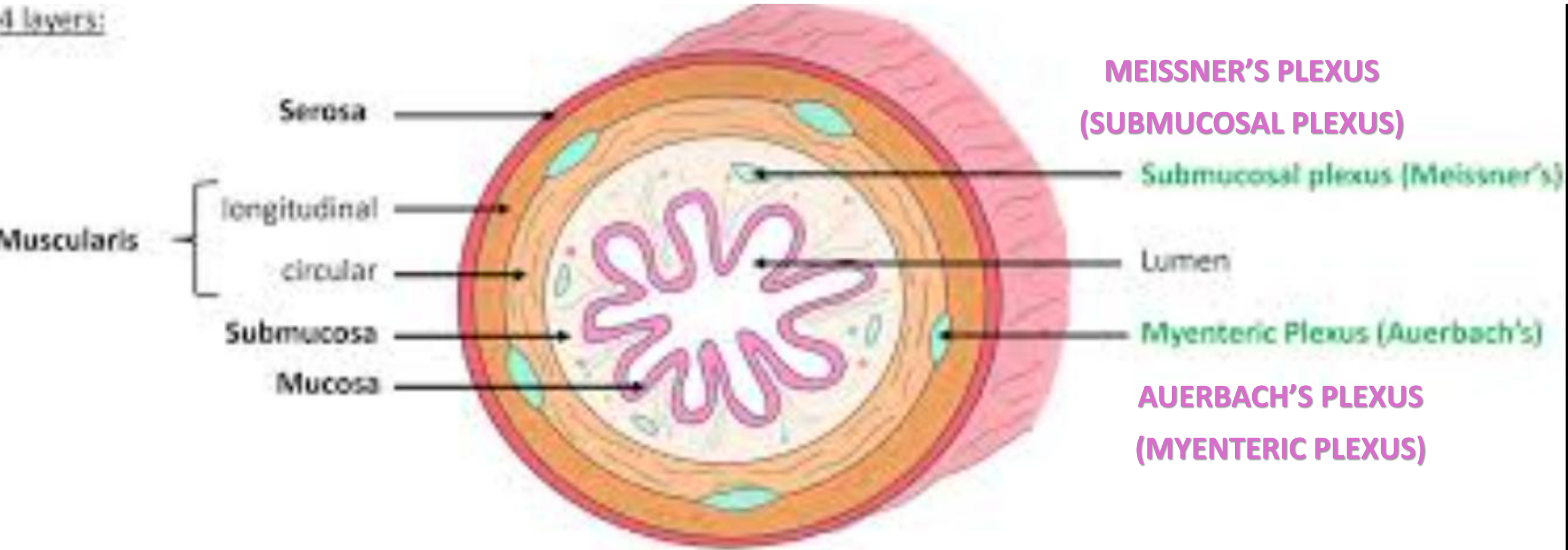
Muscularis Externa



## SUBMUCOSA OF THE ILEUM MEISSNER'S PLEXUS

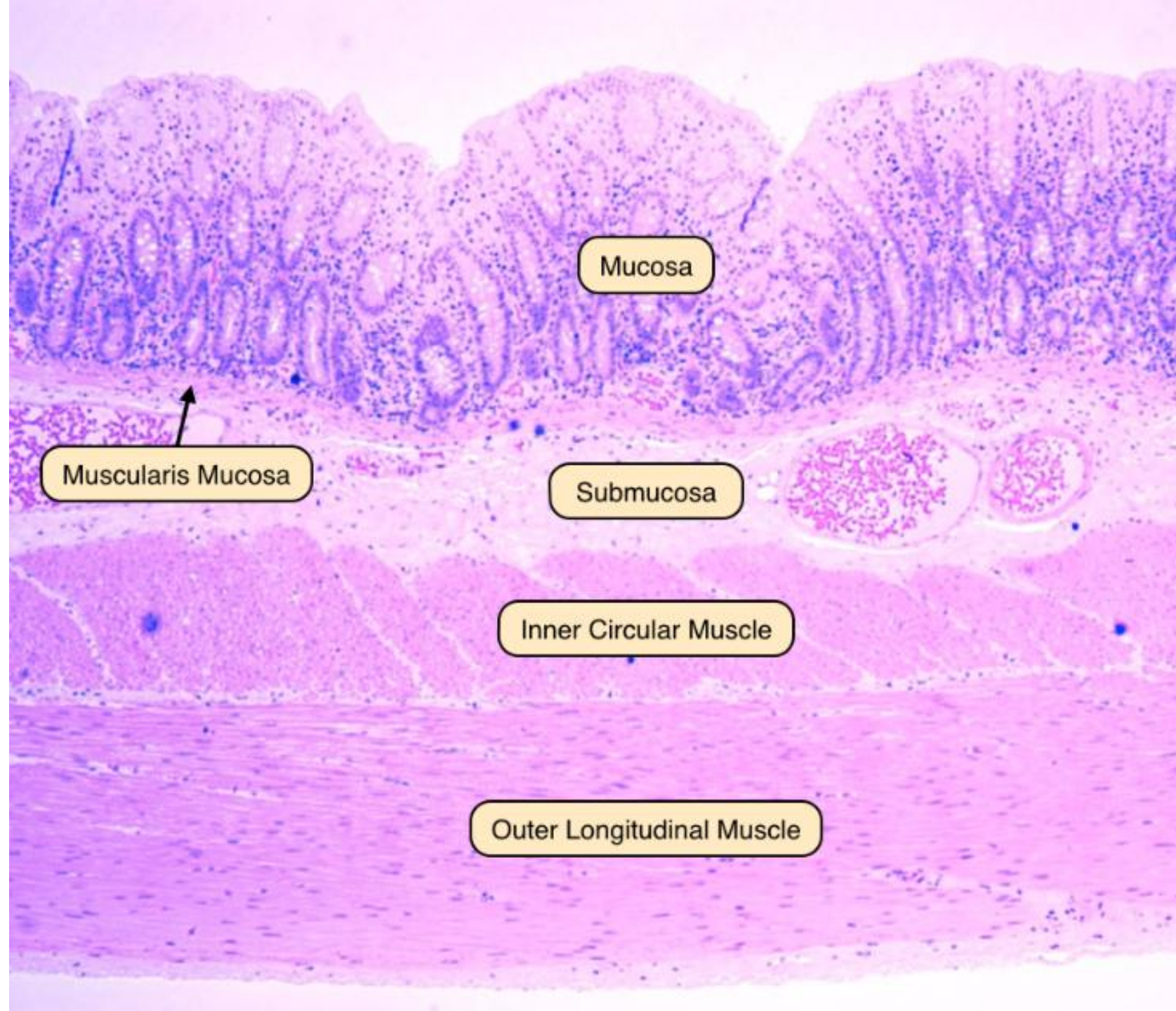
# INTESTINAL NERVOUS REGULATION

4 layers:



Together, these plexuses allow the intestine to **self-regulate digestive functions in an autonomous manner.**

# MUSCULAR TUNIC and SEROSA TUNIC OF THE ILEUM



# MICROSCOPIC DIFFERENCES BETWEEN ILEUM – JEJUNUM – DUODENUM

## Morphofunctional Integration

Characteristic	Duodenum	Jejunum	Ileum
Villi	Medium	Long and dense	Short and sparse
Goblet cells	Few	Moderate	Numerous
Brunner's glands	Present	Absent	Absent
Peyer's patches	Rare	Rare	Very abundant

