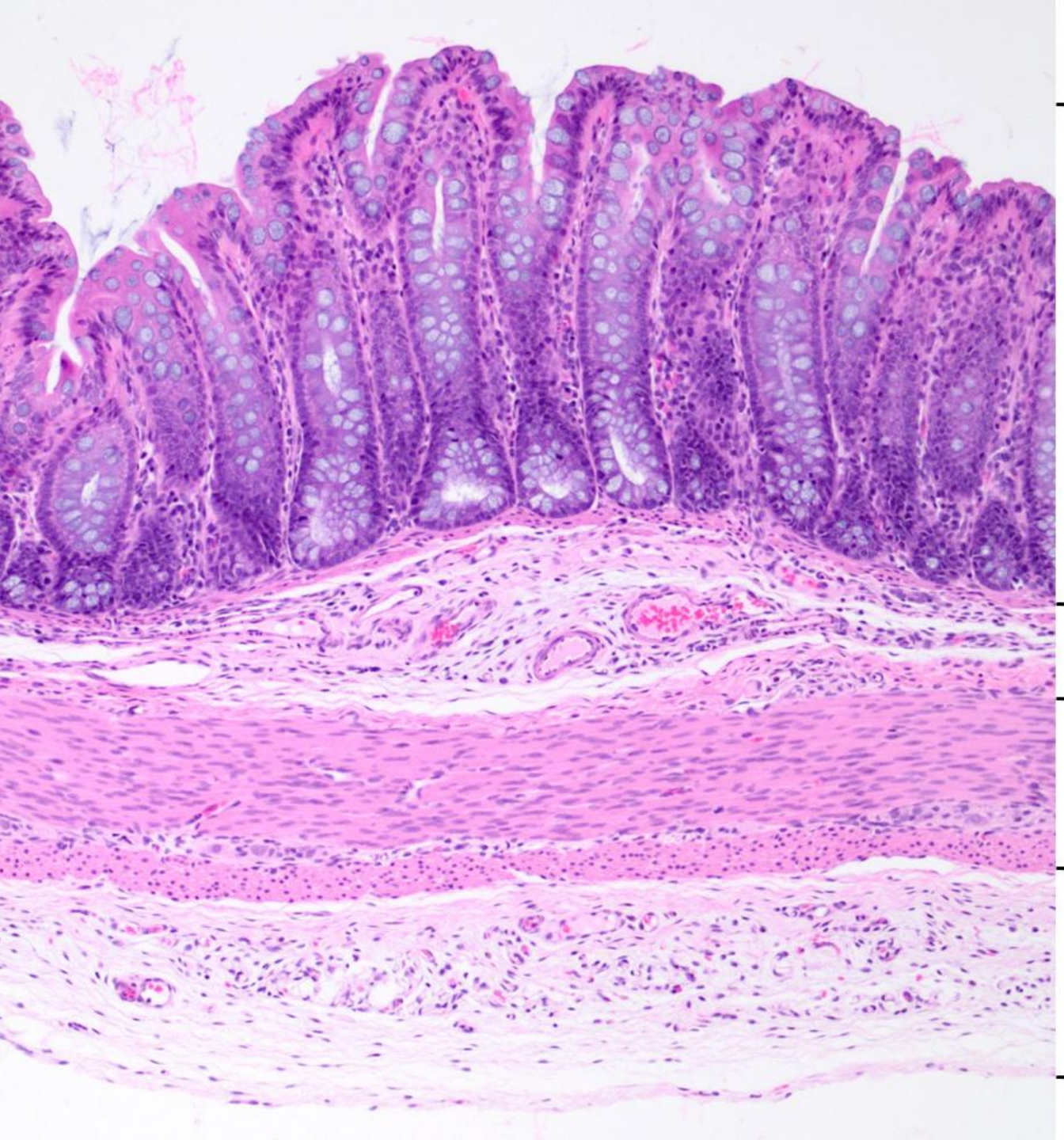
MICROSCOPIC ANATOMY OF THE DIGESTIVE SYSTEM::

1) STOMACH

2) DUODENUM

3) ILEUM



GENERAL ORGANIZATION OF THE GASTRIC WALL

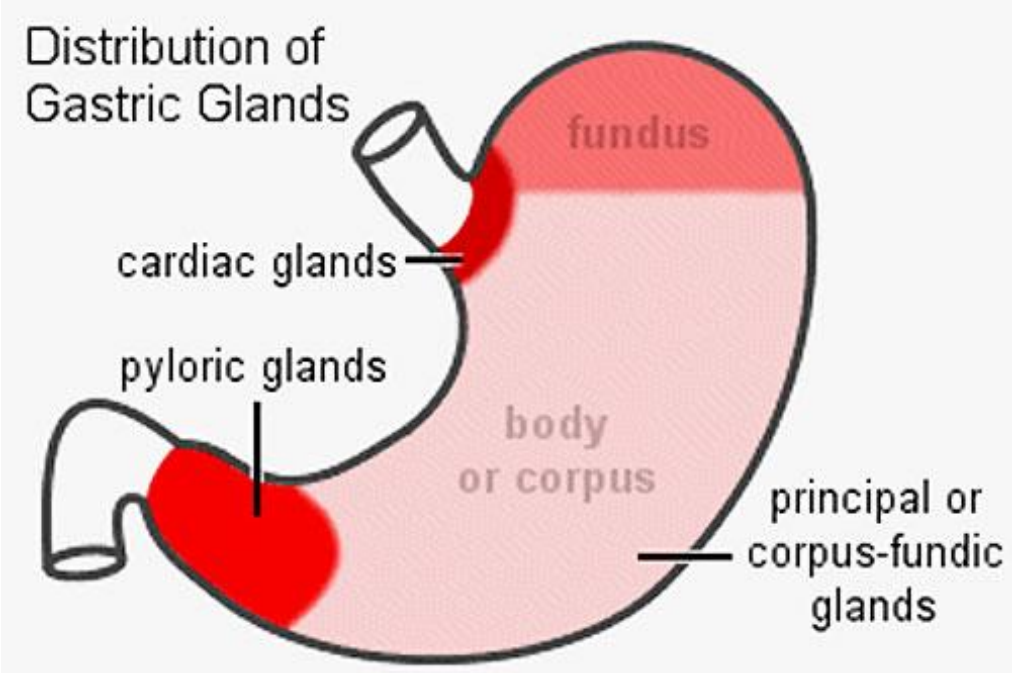
MUCOSAL LAYER (TUNICA MUCOSA)

SUBMUCOSAL LAYER (TUNICA SUBMUCOSA)

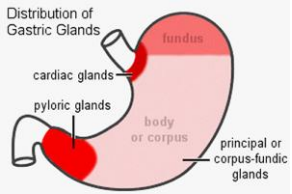
MUSCULAR LAYER (TUNICA MUSCULARIS)

SEROSA

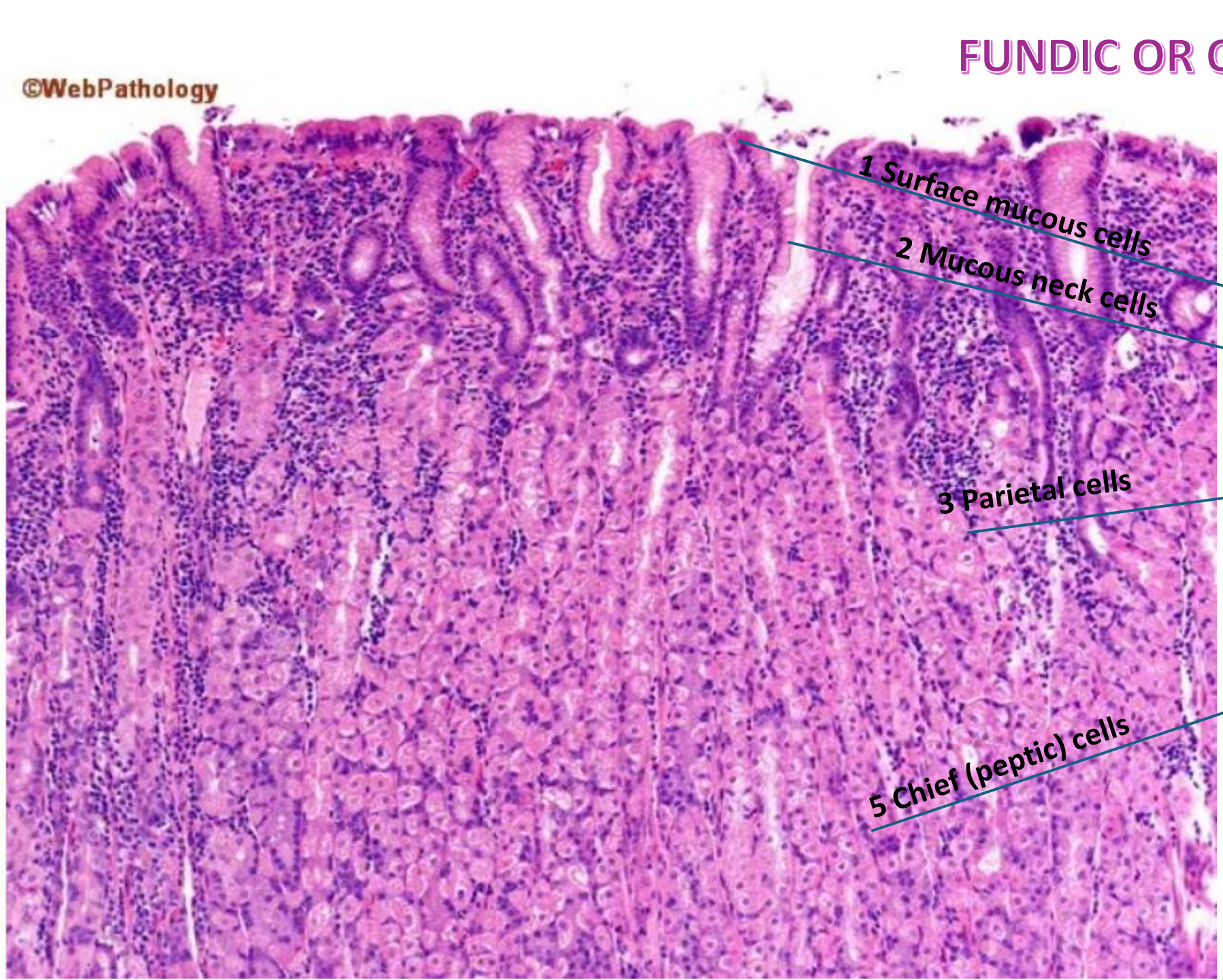
MICROSCOPIC REGIONS OF THE GASTRIC MUCOSA

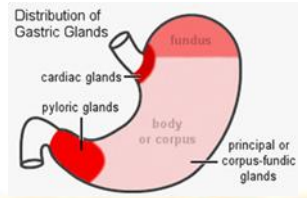


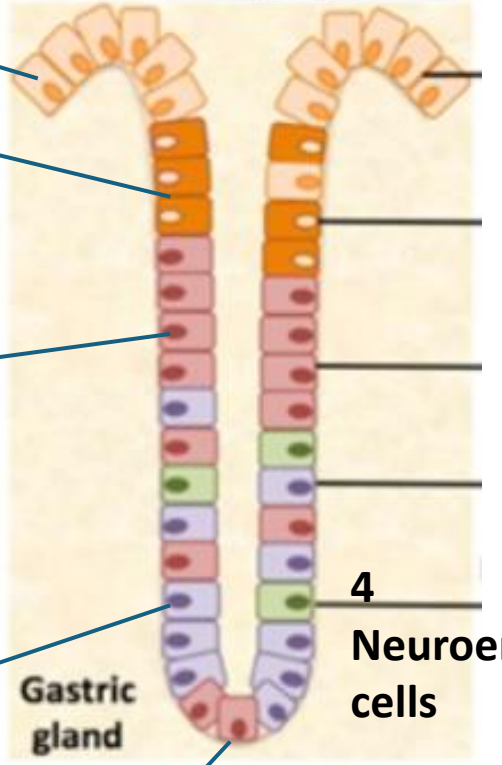
CARDIAC REGION



FUNDIC OR OSSINTIC REGION



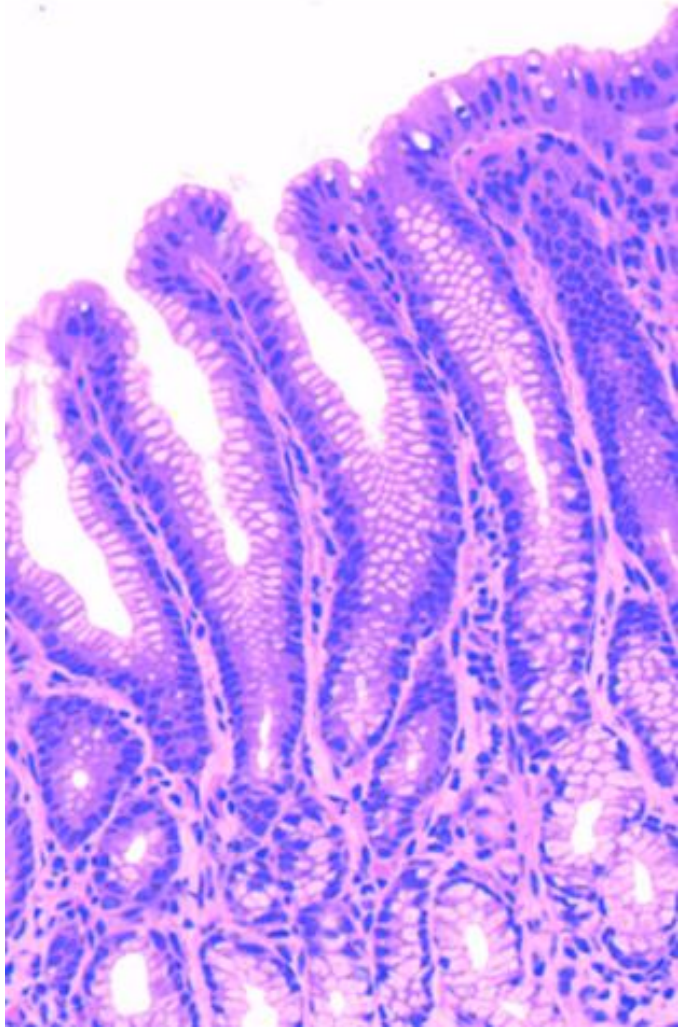


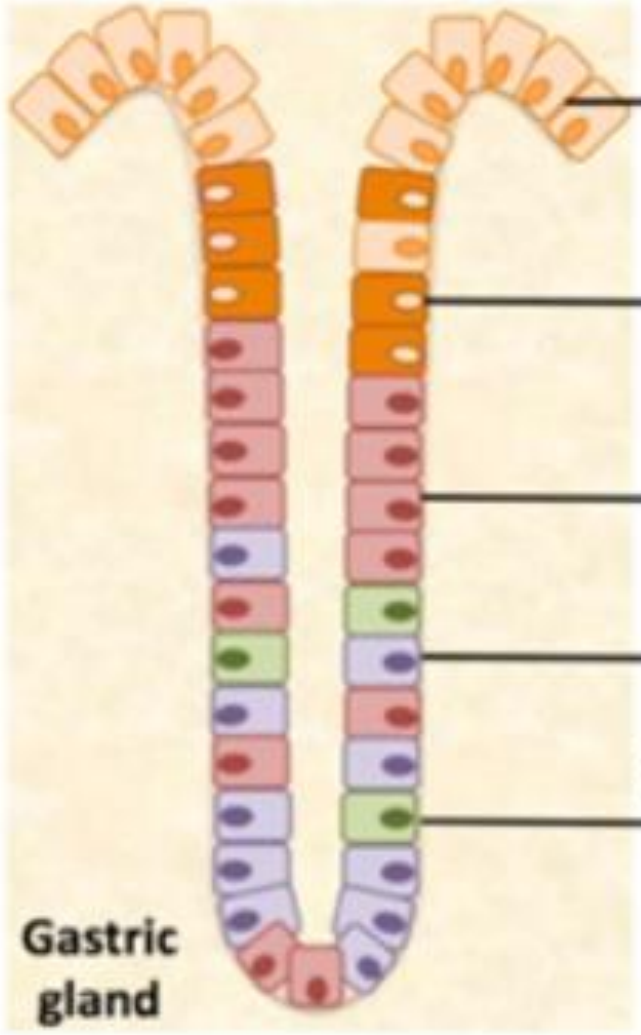


4 **Neuroendocrine cells**

6 **Stem cells**

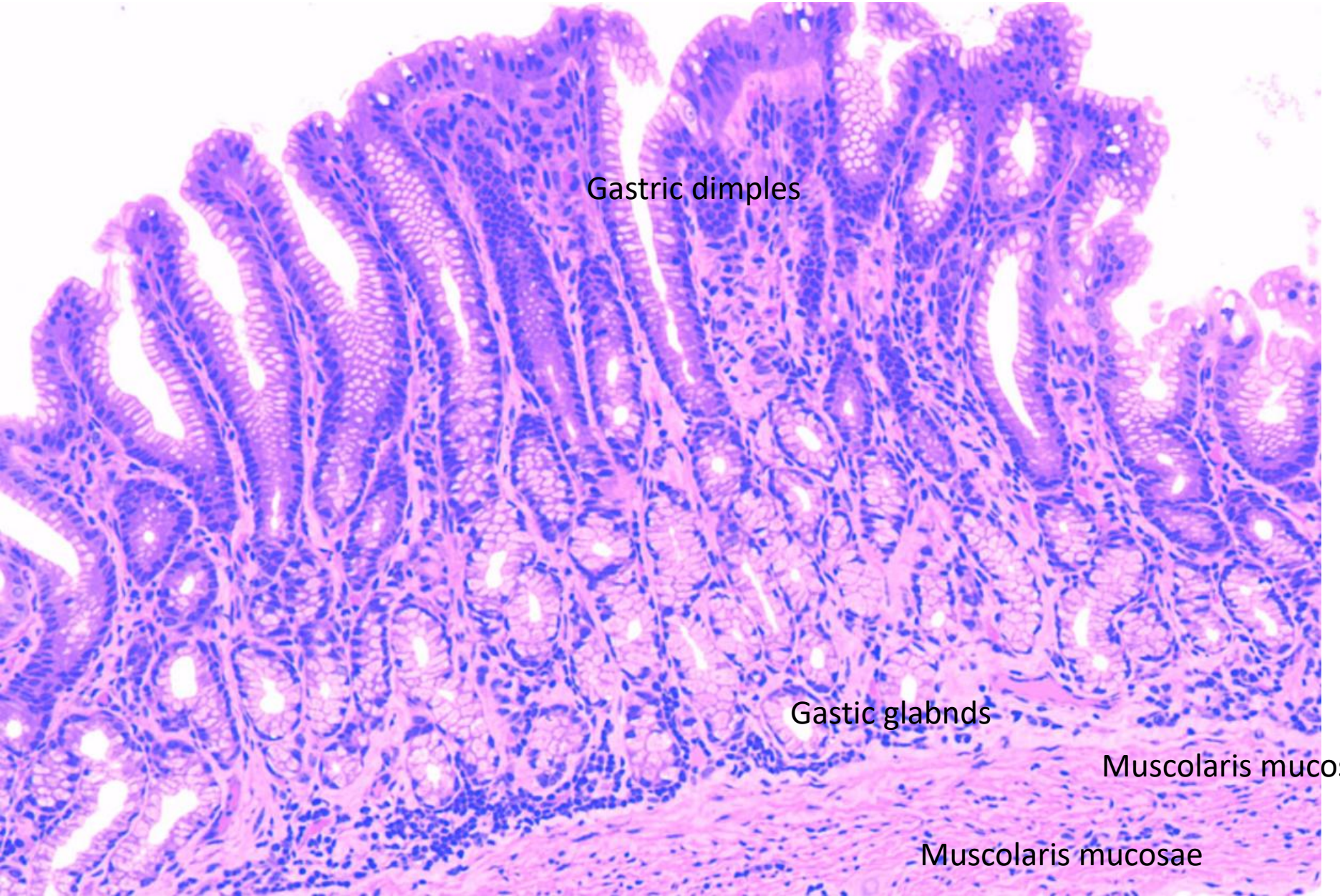
SECRETIONS OF THE CELLSOF THE FUNDIC GLANDS

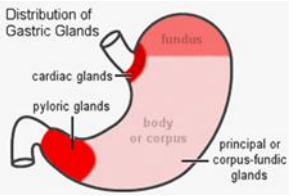




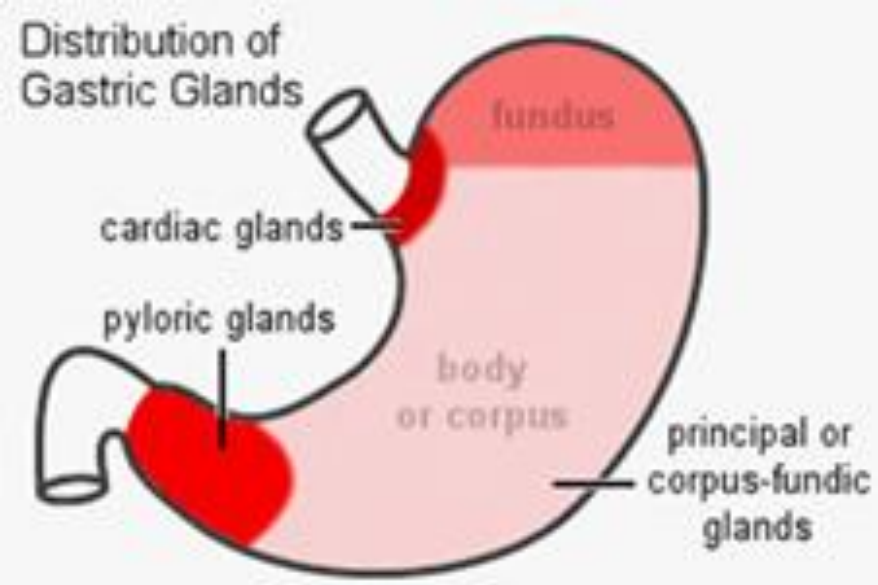
Neuroendocrine cells are difficult to observe in routine H&E sections, and stem cells are even more difficult to identify..

PILORIC REGION

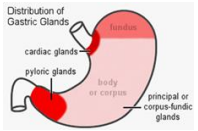




SUMMARY OF THE THREE HISTOLOGICAL REGIONS OF THE STOMACH



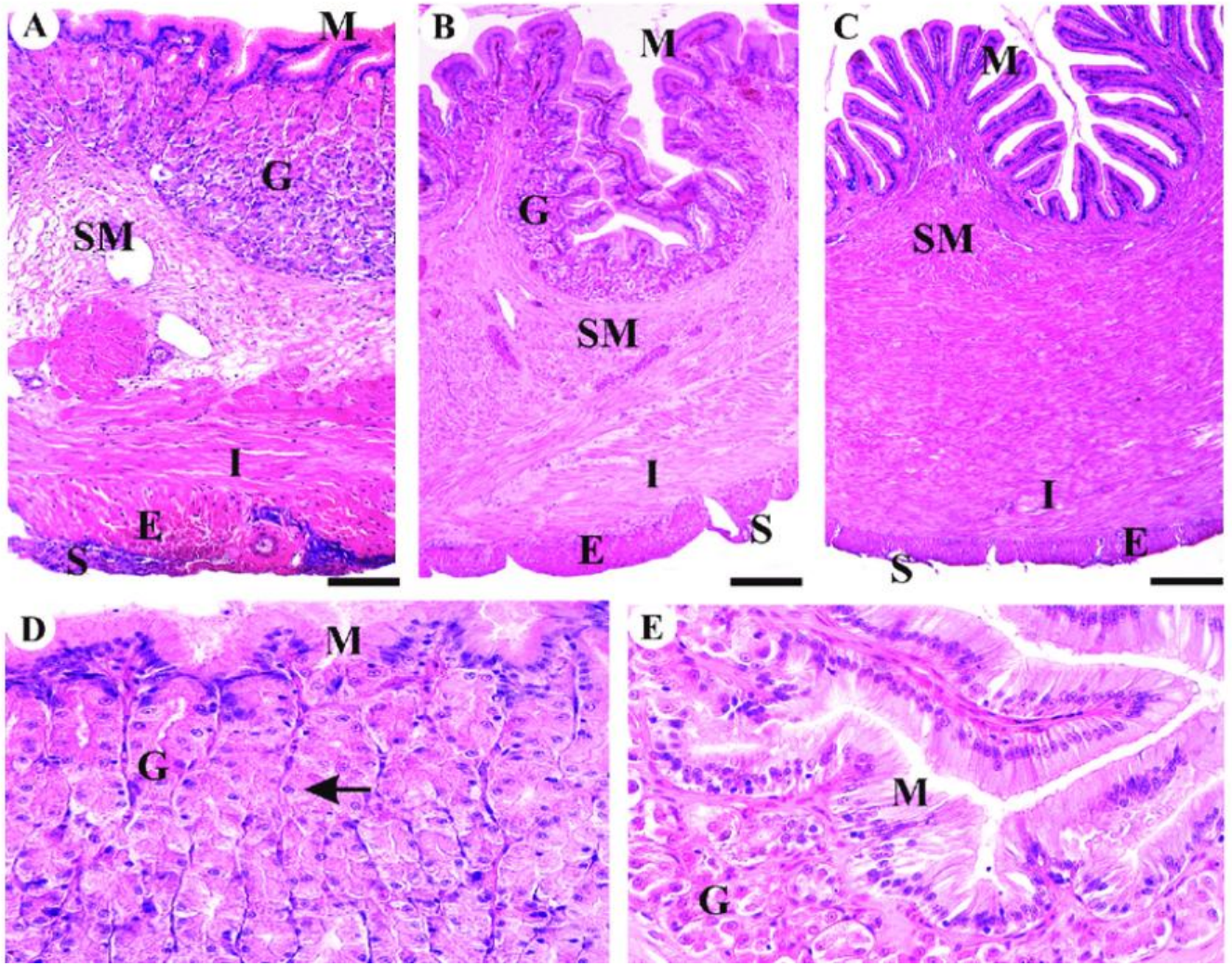
SUMMARY OF THE THREE HISTOLOGICAL REGIONS OF THE STOMACH



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).

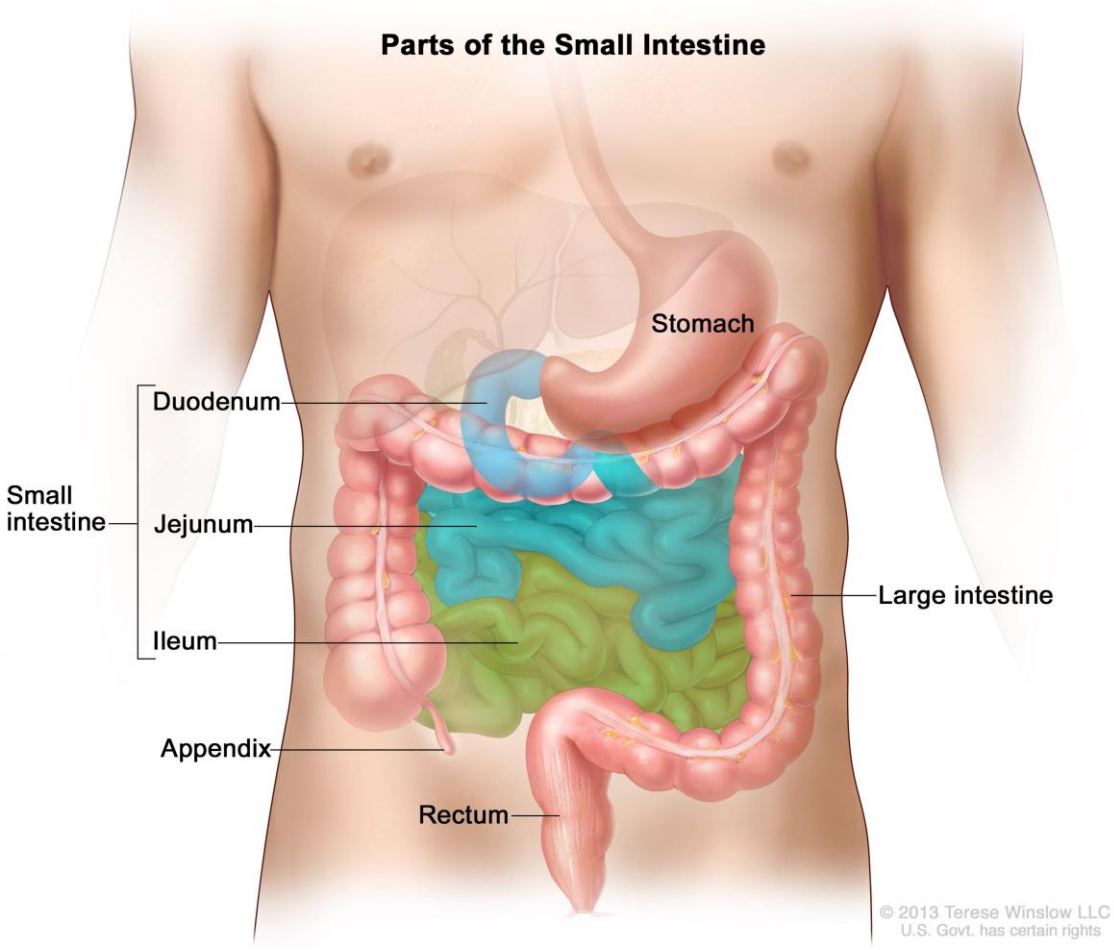


MICROSCOPIC ANATOMY OF THE SMALL INTESTINE:

Duodenum

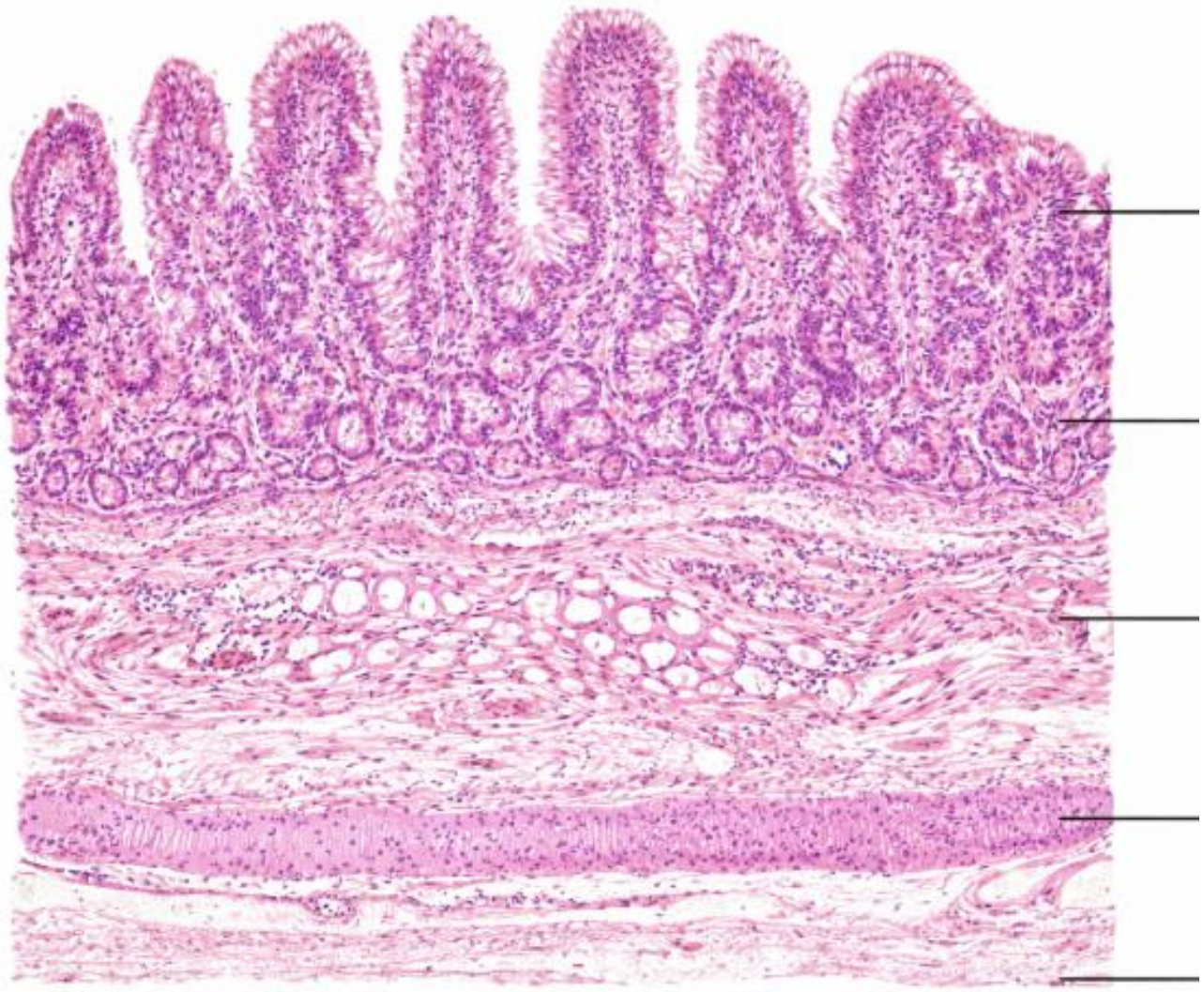
Jejunum

Ileum

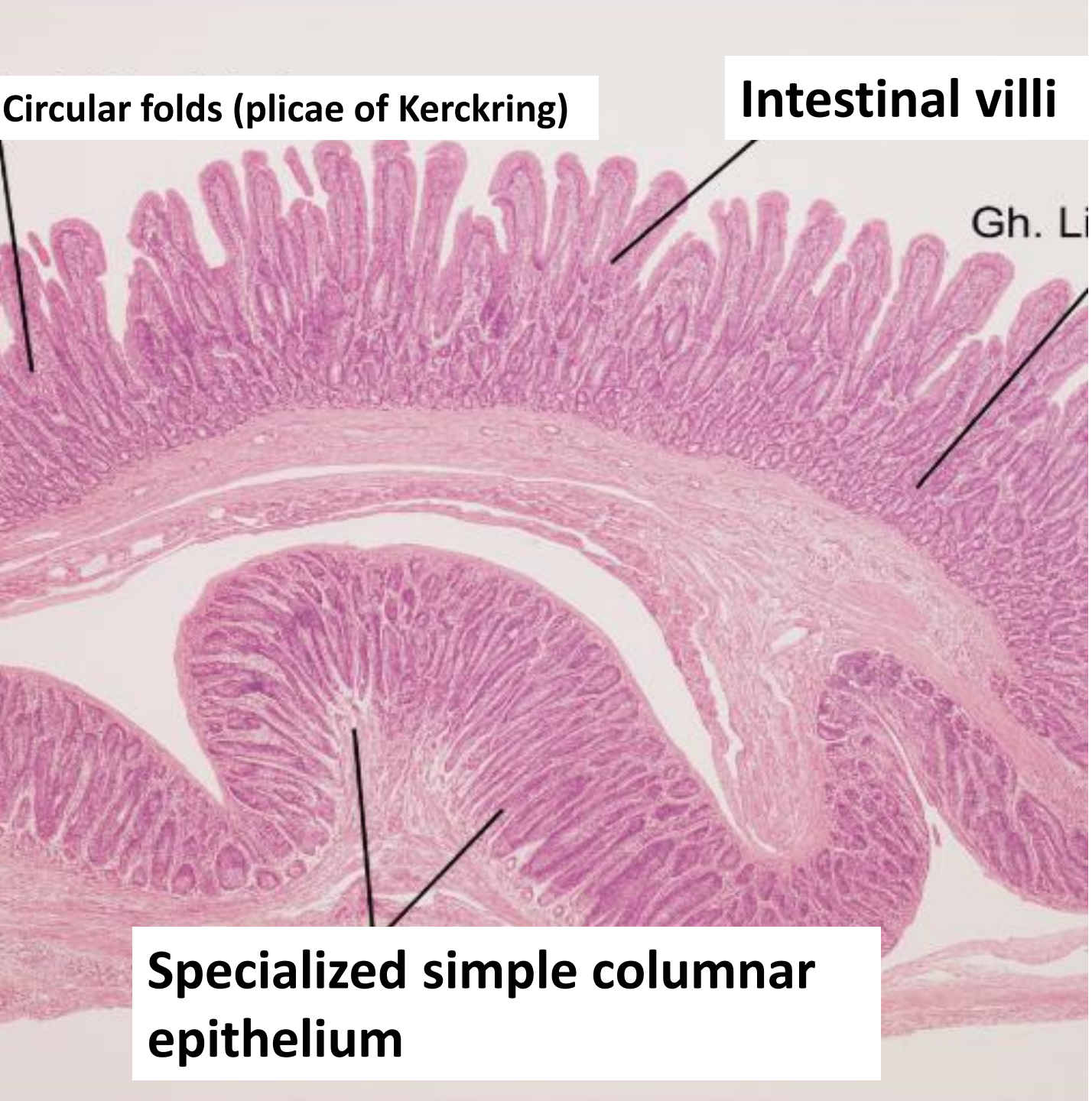


MICROSCOPIC ANATOMY OF THE SMALL INTESTINE
duodenum

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

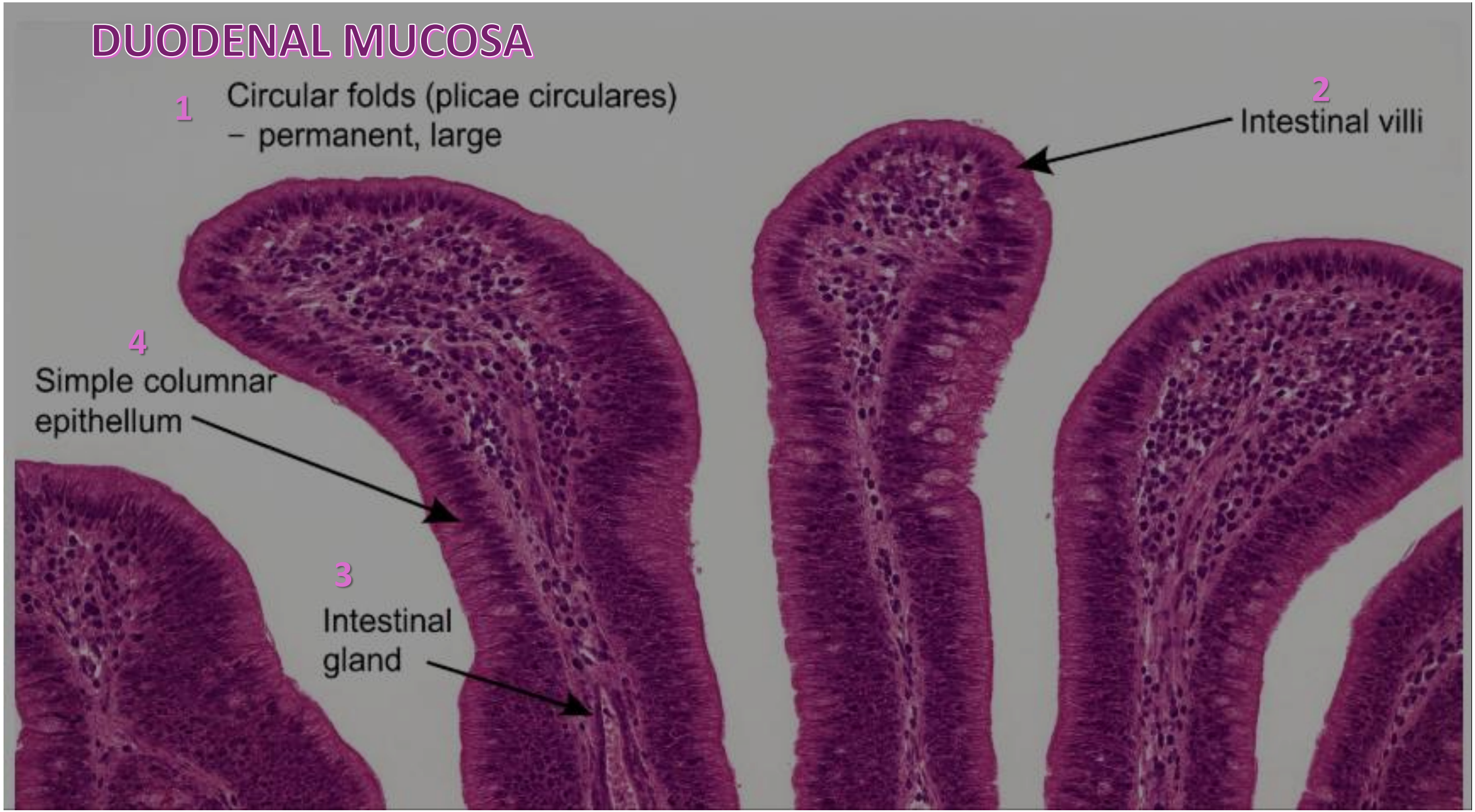


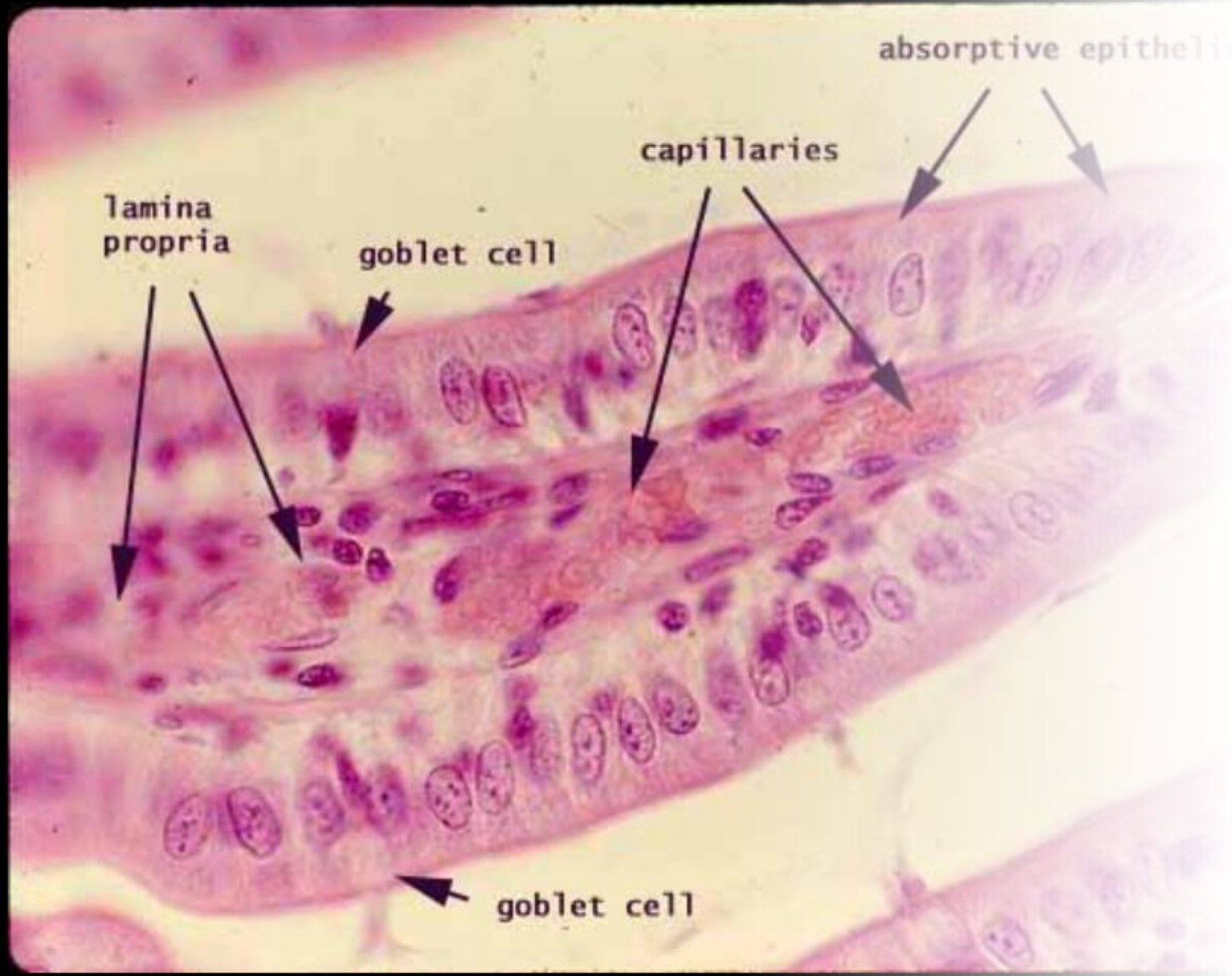
- **Mucosa**
- **Submucosa**
- **Muscular layer**
- **(Tunica muscularis)**
- **Serosa / Adventitia**



DUODENAL MUCOSA

DUODENAL MUCOSA





CELL TYPES OF THE EPITHELIUM: integrated function

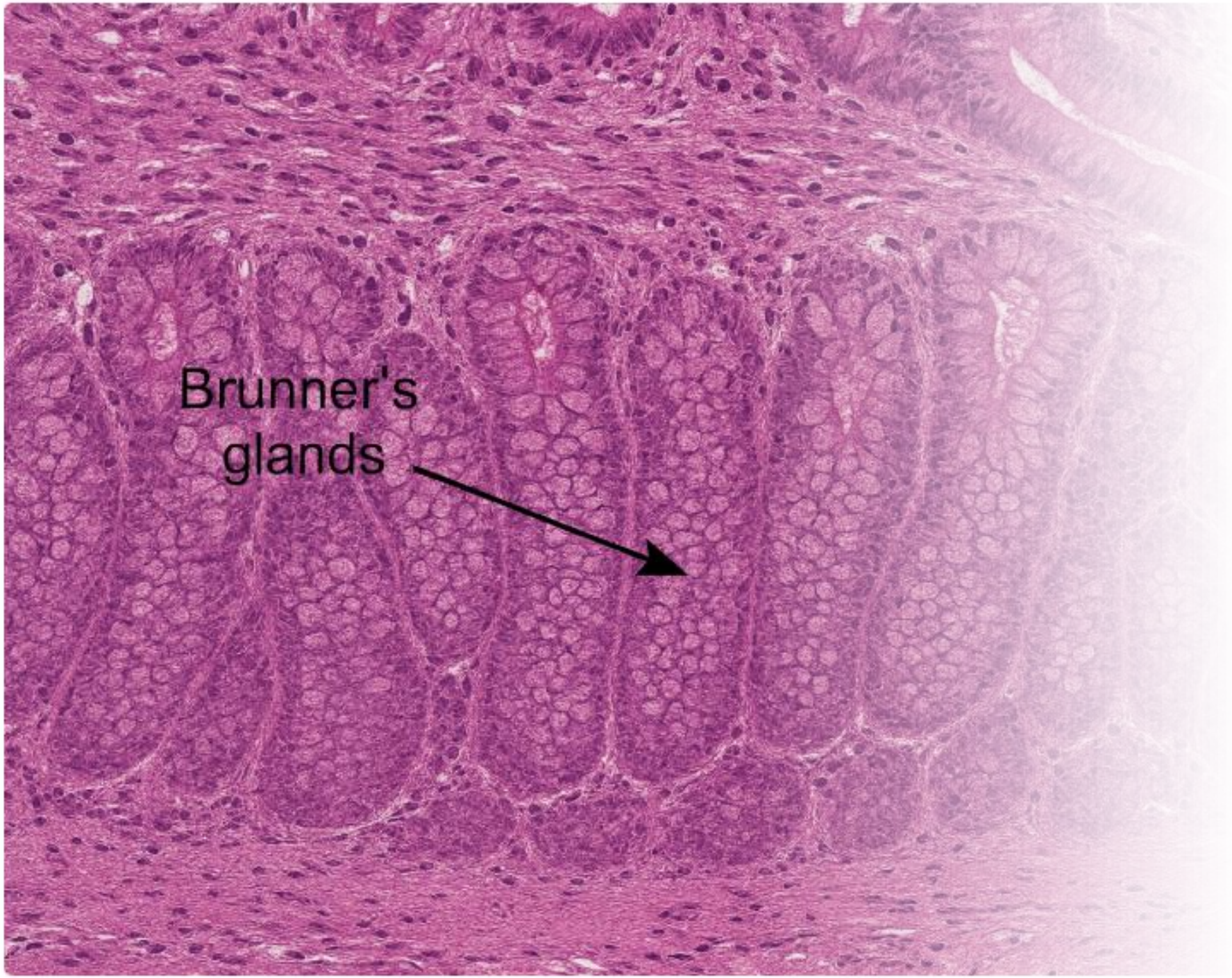
Enterocytes
Columnar cells with a **brush border** (microvilli).
Function: terminal digestion and absorption of **monosaccharides, amino acids, and pre-emulsified lipids**.

Goblet cells
Produce **lubricating and protective mucus**.
Present in the duodenum but **less numerous than in the ileum**.

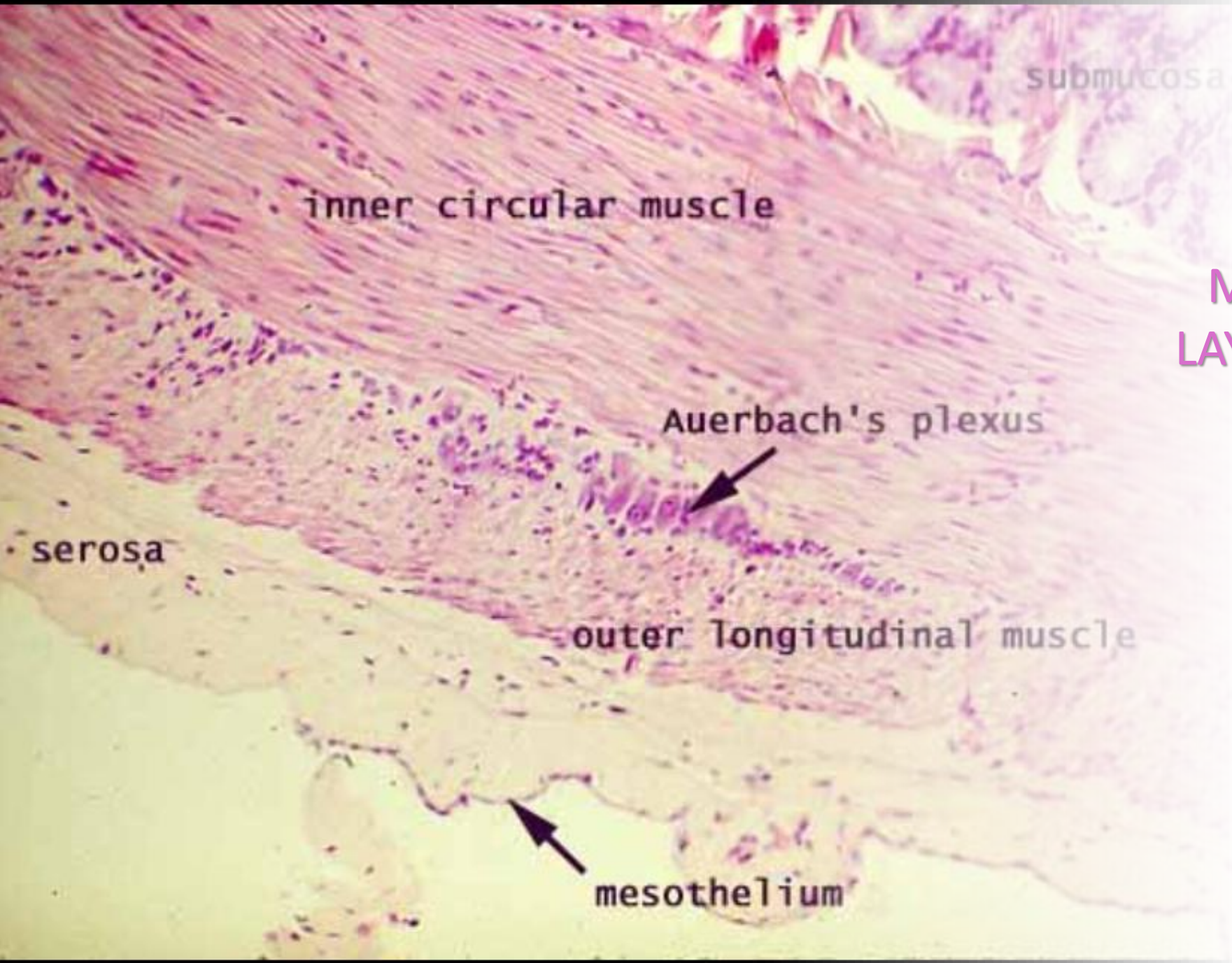
Paneth cells
Located at the **base of the crypts**.
Contain **eosinophilic granules** rich in **lysozyme** and **α-defensins**.
Play an **immune role** in the regulation of the microbiota.

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**).



DUODENAL SUBMUCOSA



MUSCULAR AND SEROUS LAYERS OF THE DUODENUM

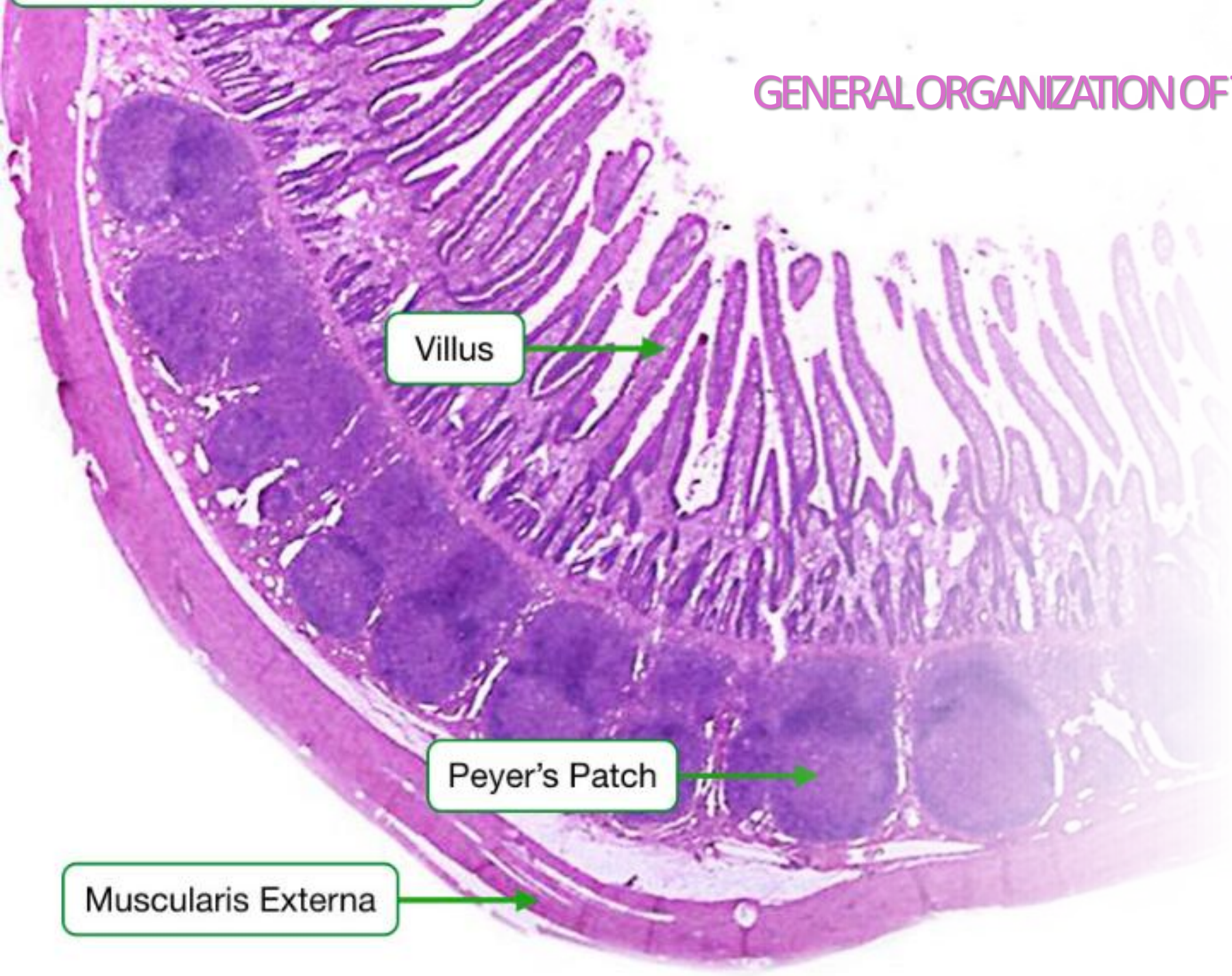
- **TUNICA MUSCULARIS**:

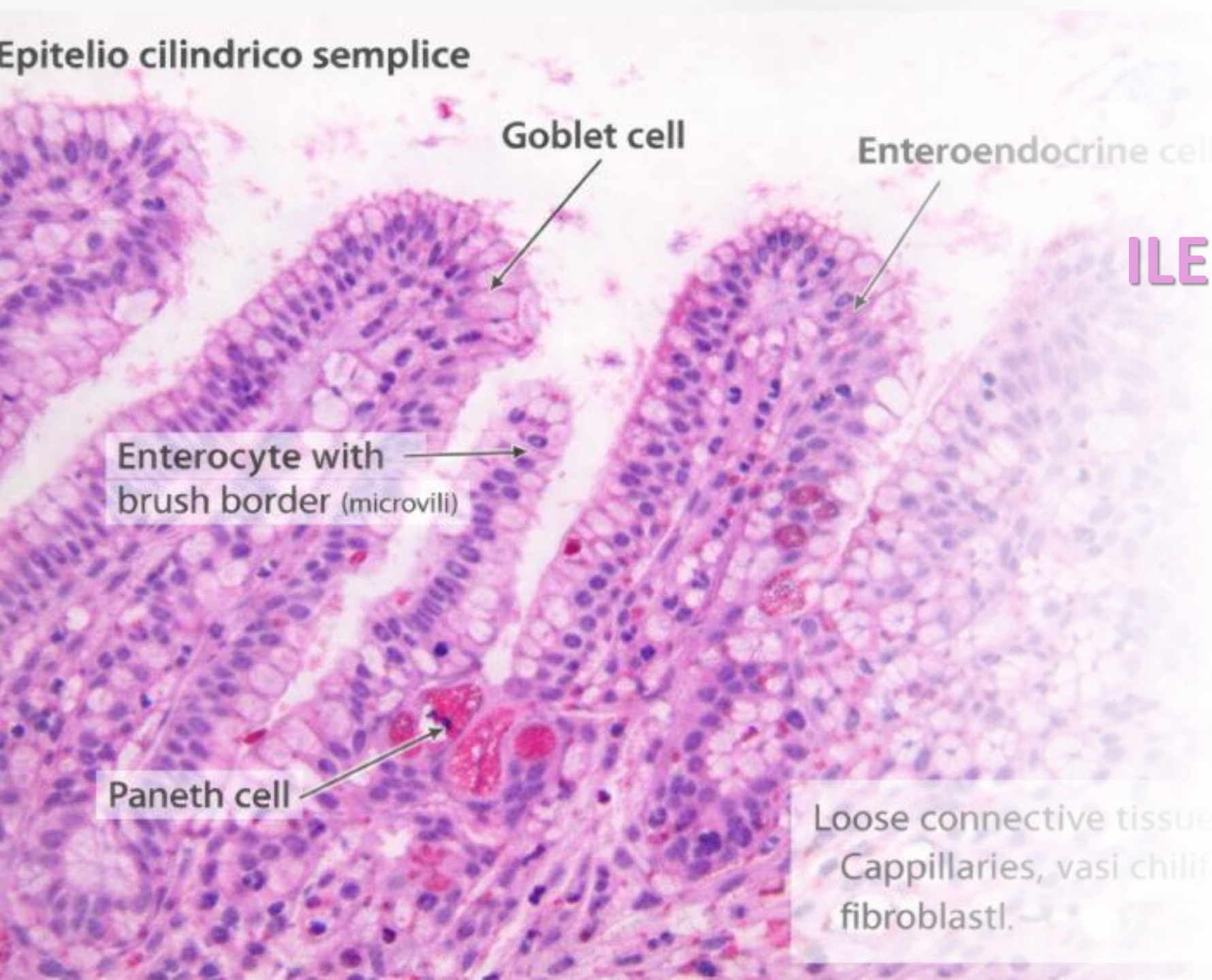
A Circular inner layer

B Longitudinal outer layer

- **SEROSA**

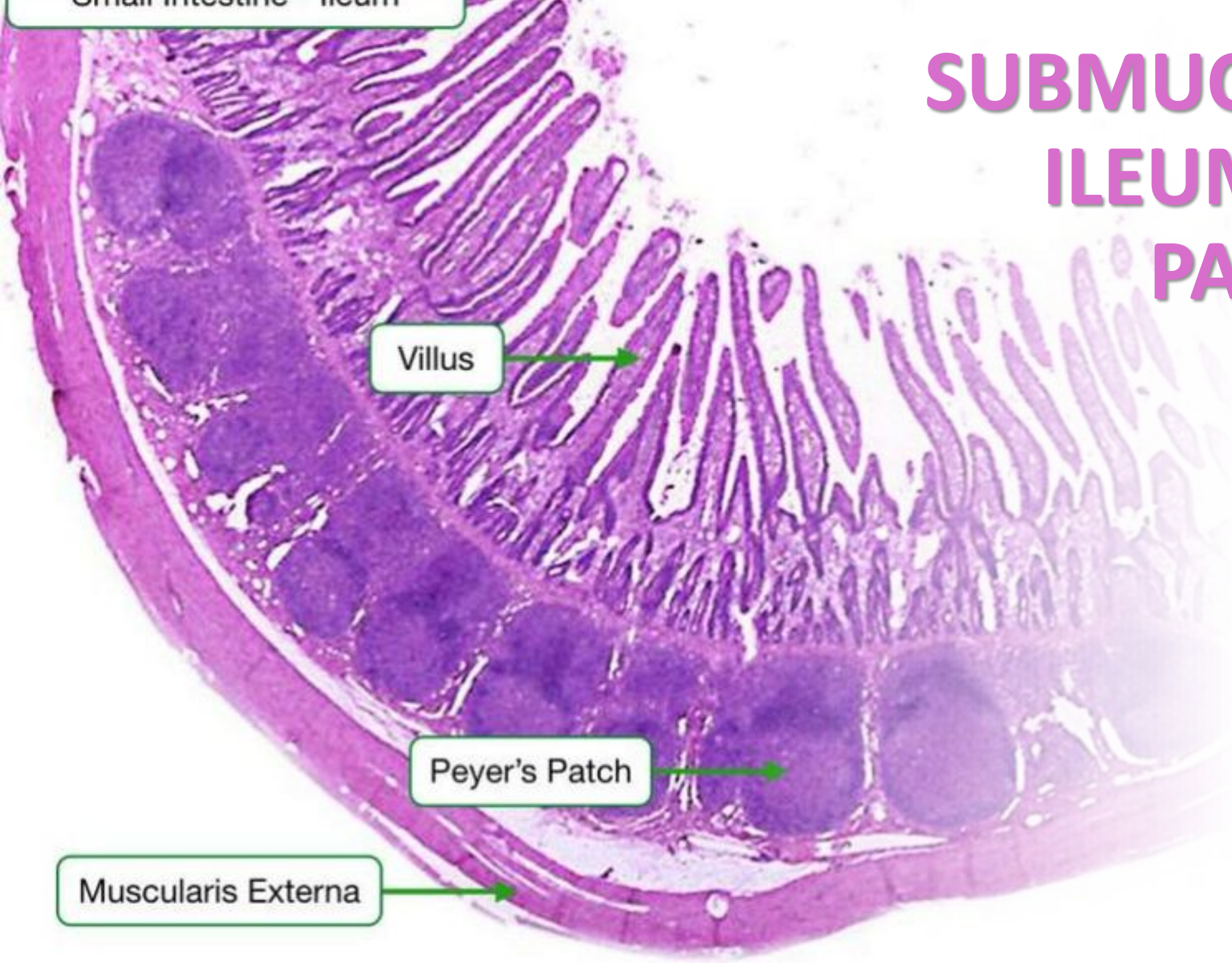
GENERAL ORGANIZATION OF THE ILEAL WALL

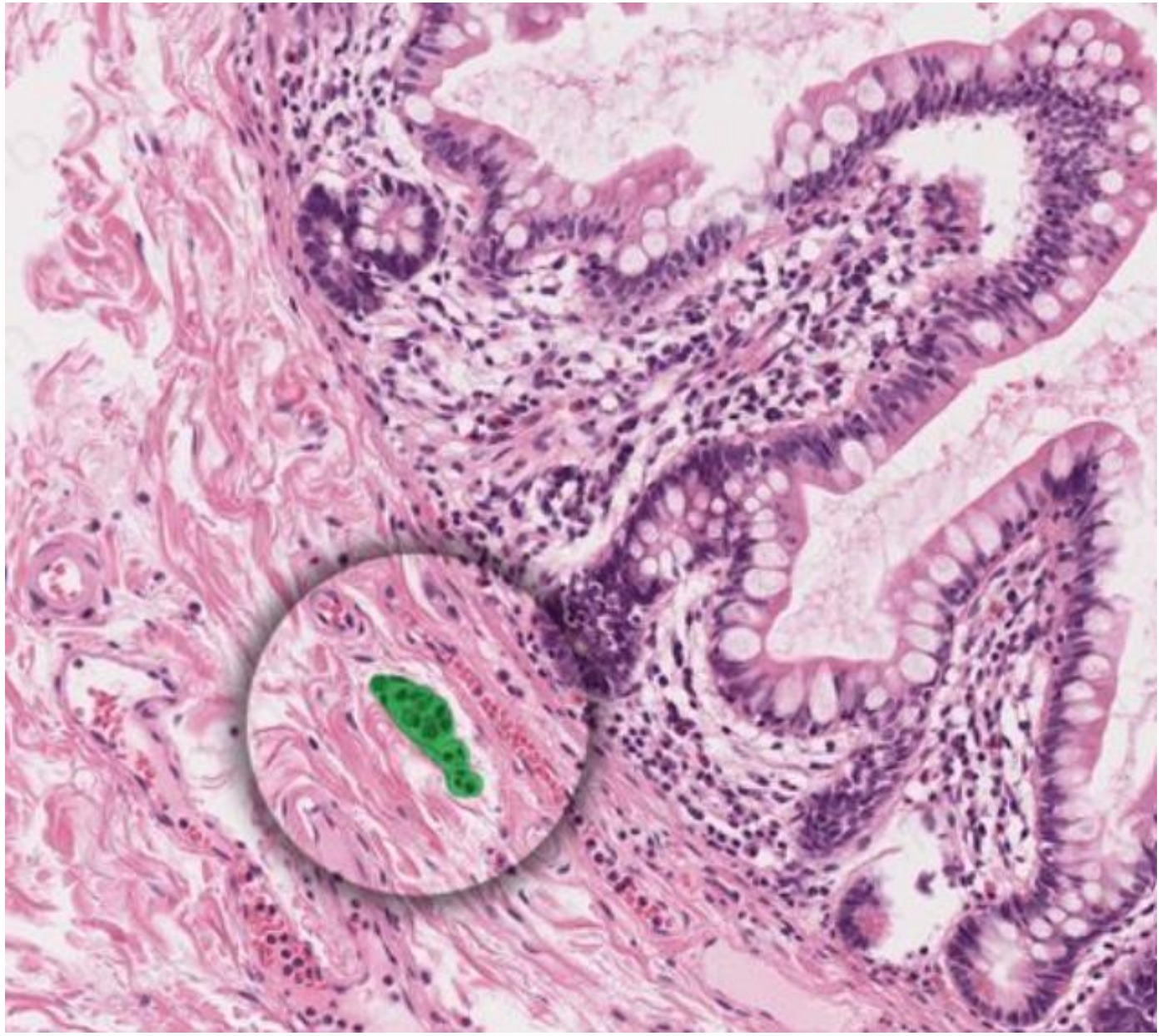




ILEUM MUCOSA

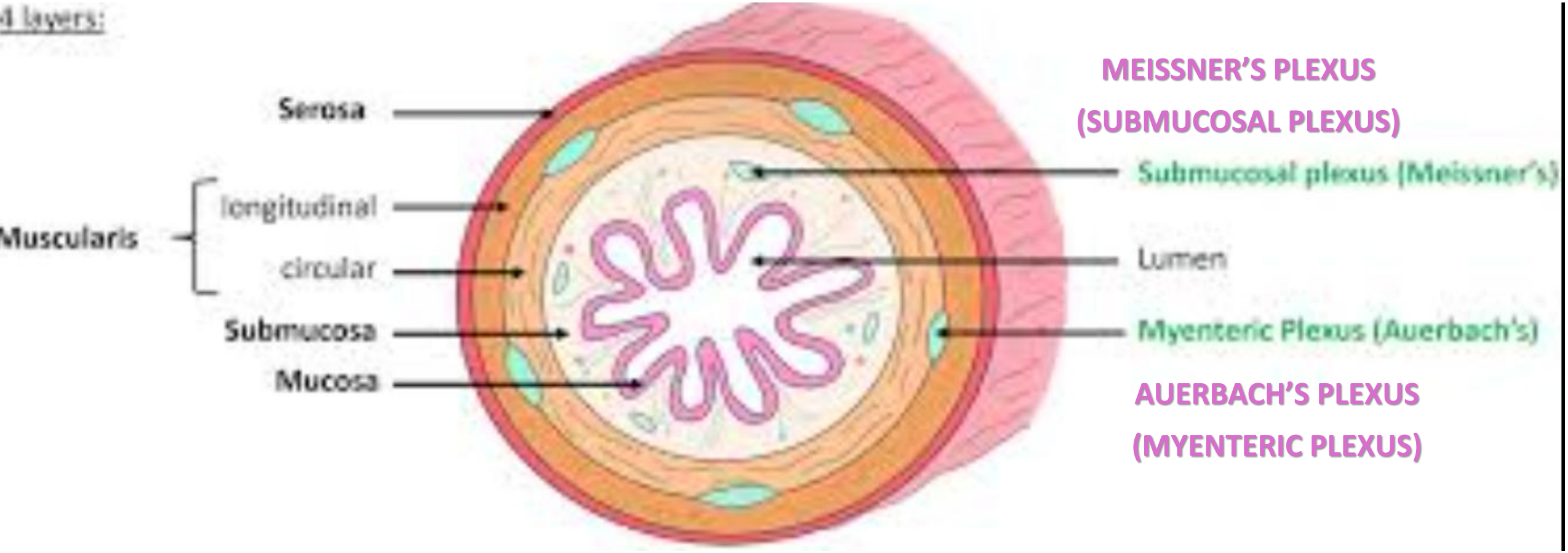
SUBMUCOSA OF THE ILEUMPEYER'S PATCHES





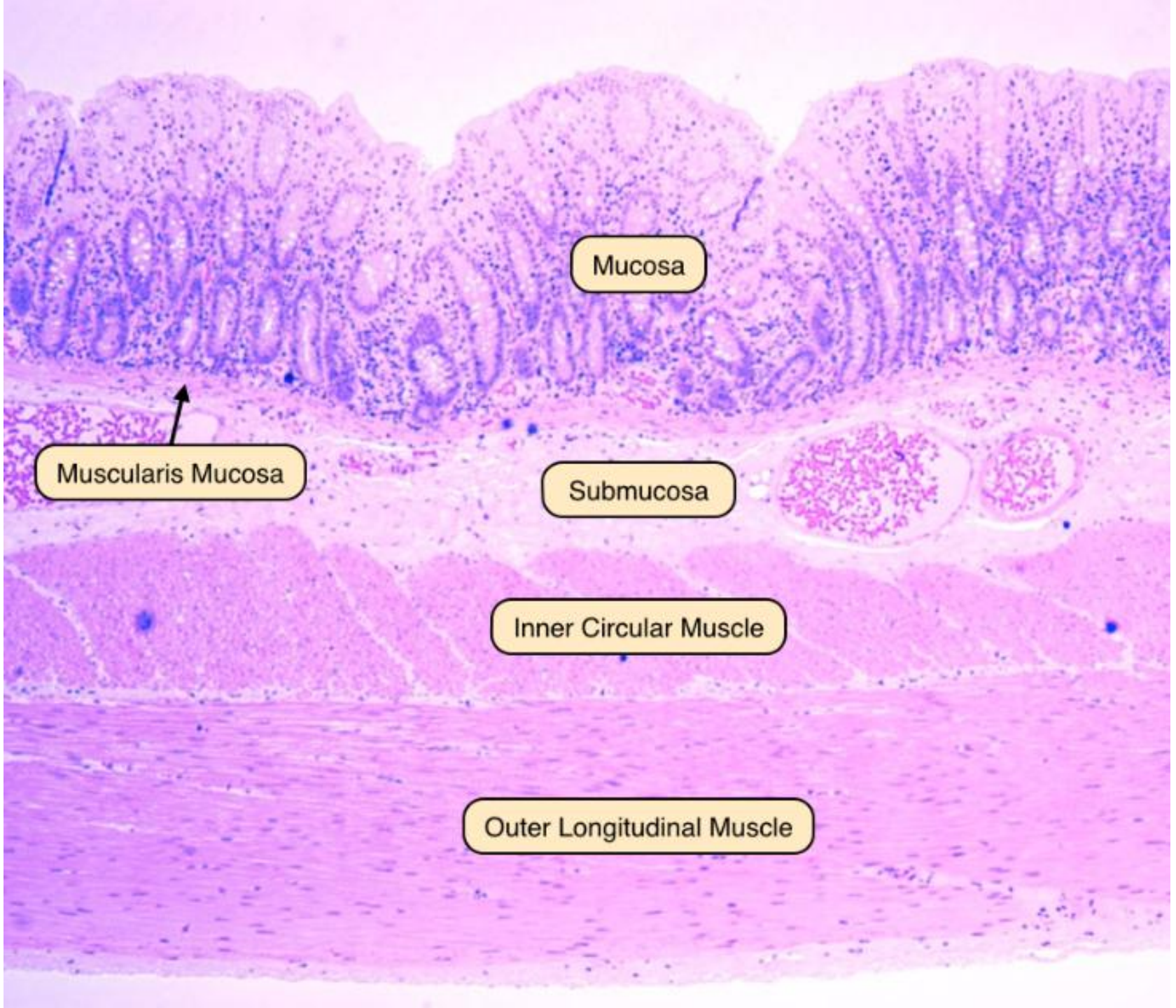
SUBMUCOSA OF THE ILEUMMEISSNER'S PLEXUS

INTESTINAL NERVOUS REGULATION



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