

DIGESTIVE SYSTEM - 2

Oesophagus , stomach,
duodenum, ileum, appendix ,
colon , rectum and anal canal.

■ IN GENERAL , HISTOLOGICAL
STRUCTURE OF GASTROINTESTINAL
TRACT CONSIST OF FOUR LAYERS:

1. MUCOSA – LINING EPITHELIUM, LAMINA PROPRIA,
MUSCULARIS MUCOSA

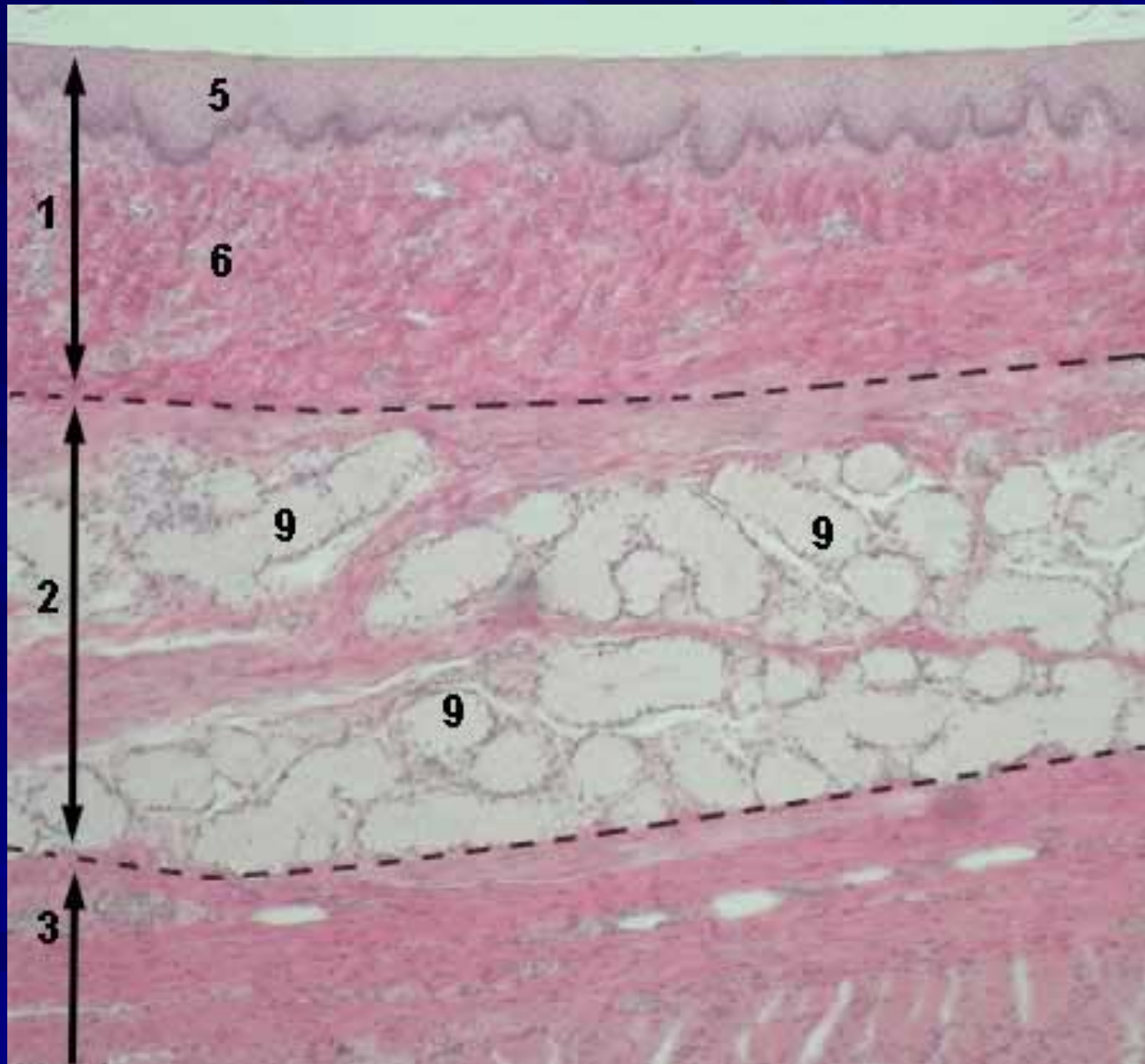
2. SUBMUCOSA

3. MUSCULARIS EXTERNA

4. ADVENTITIA

OESOPHAGUS

- **MUCOSA – LINING EPITHELIUM** Non keratinized stratified squamous epithelium.
 - LAMINA PROPRIA Consist of collagen fibers and few elastic fibers containing blood vessels and nerves. In lower part there are esophageal cardiac glands.
 - MUSCULARIS MUCOSA Thin strips of muscles arranged in two layers , outer longitudinal , inner circular.
- **SUB MUCOSA** – consist of collagen fibers and some elastic fibers, plenty of blood vessels and nerves(meissner's plexus) . Also contain sub mucosal mucous glands.
- **MUSCULARIS EXTERNA** – inner circular , outer longitudinal. They are striated in upper 1/3rd , mixed in middle 1/3rd , and smooth muscle fibers in lower 1/3rd .
- **ADVENTITIA** – Consist of collagen fibers and elastic fibers. blood vessels and nerves are there. Lower one inch is surrounded by the peritoneum (serosa).



STOMACH

■ **MUCOSA** : Thick and thrown in to folds.

EPITHELIUM :Single layer of tall columnner cells. Upper part of cell contain mucigen and is unstained in H& E. Goblet cells absent. They secrete mucous.

LAMINA PROPRIA : Stdded with glands (simpel or compound tubular mucous glands.)Gastric glands are of three types cardiac, fundic and body glands, pyloric glands.

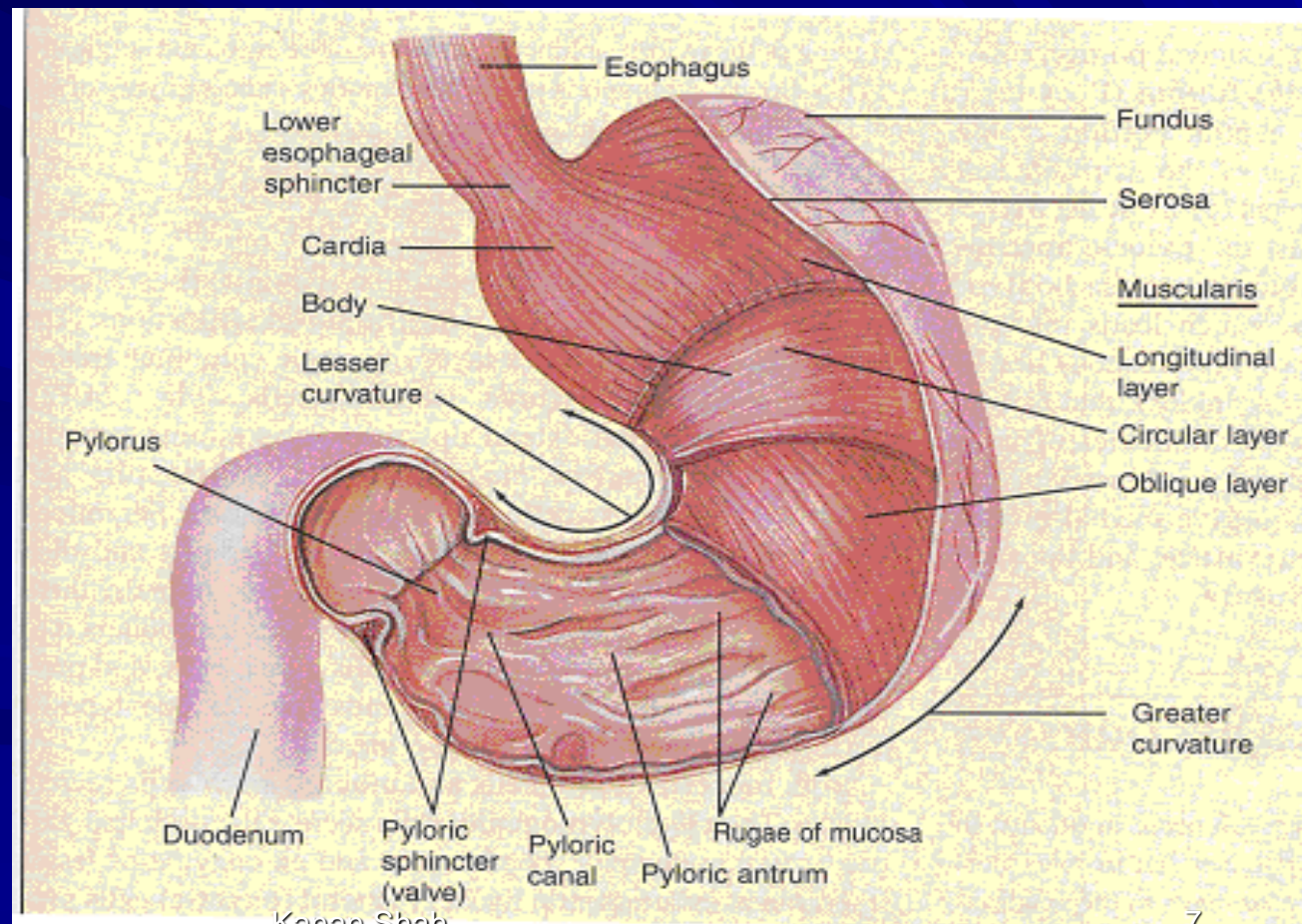
CARDIAC GLANDS : Few in number, simple tubular or branched and all secrete mucous.

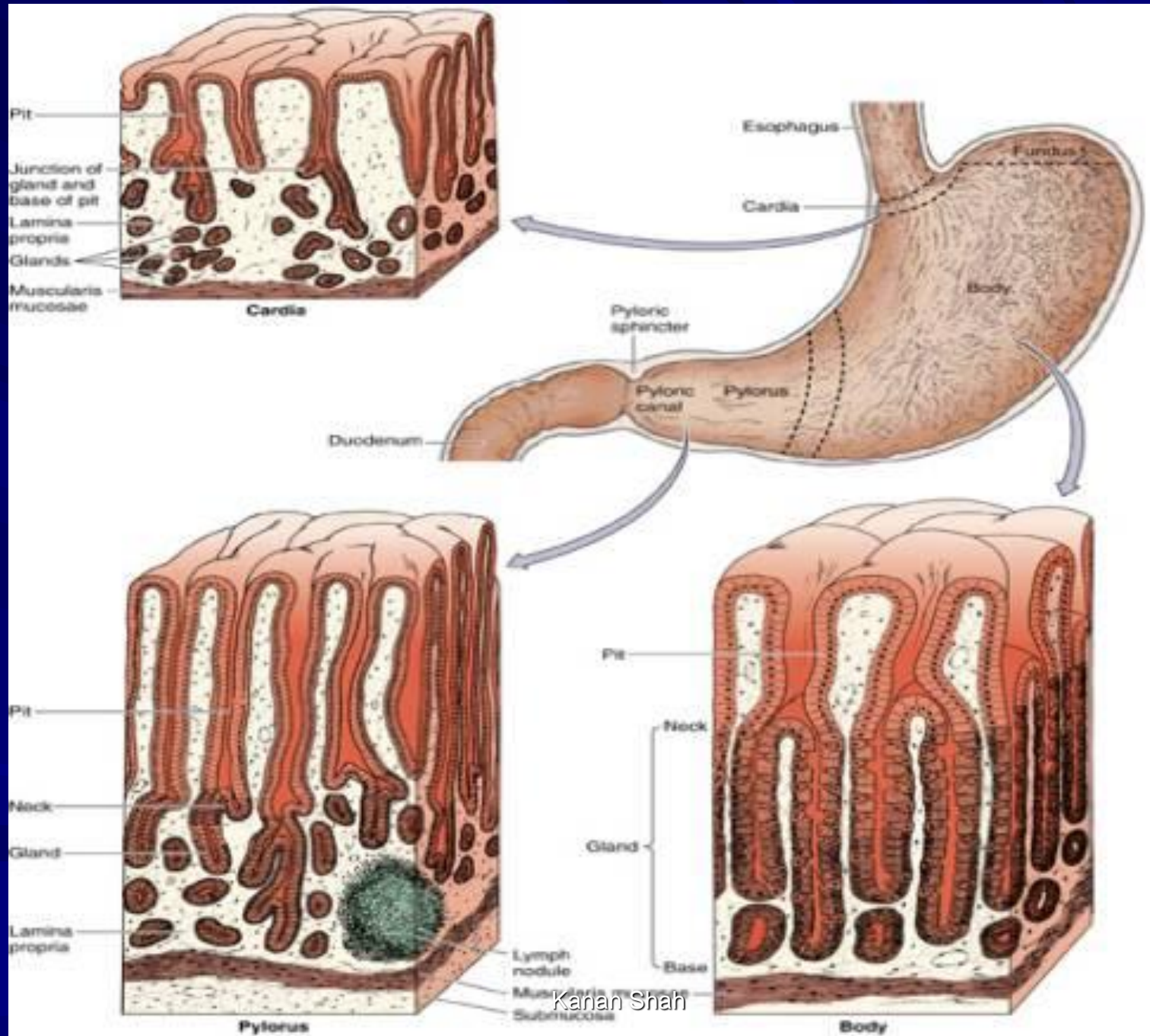
FUNDIC and BODY GLANDS: Consist of short duct which is connected with two or more straight gland tubes. Each gland tube is lined by three types of cells
ZYMOGENIC or CHIEF CELLS(pepsinogen) ,
OXYNTIC CELLS or PARIETAL CELLS (HCL),
MUCOUS NECK CELLS.

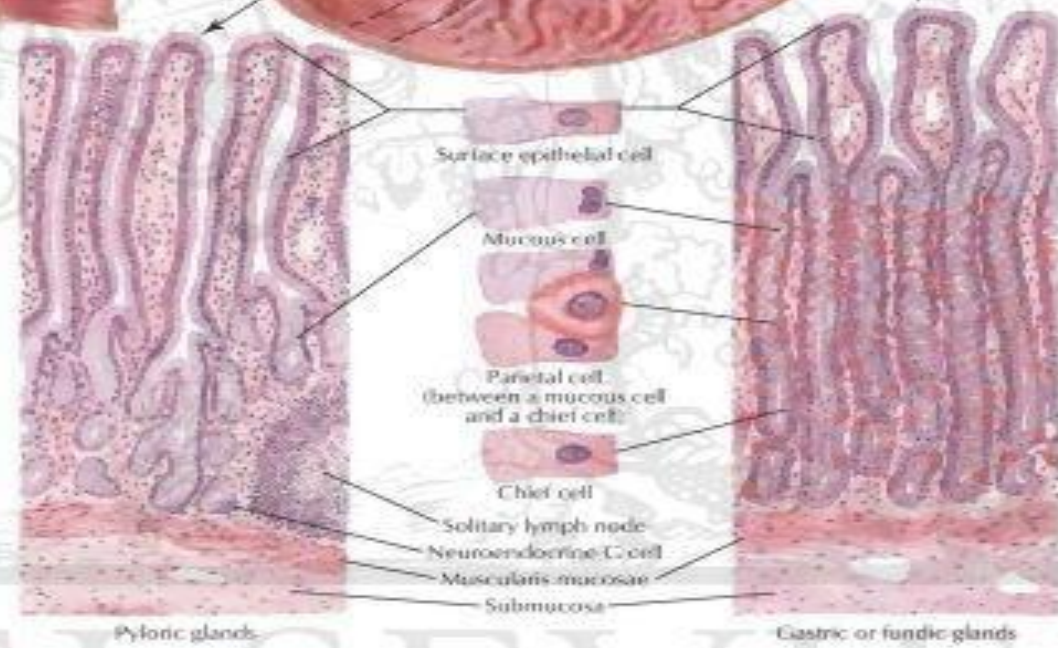
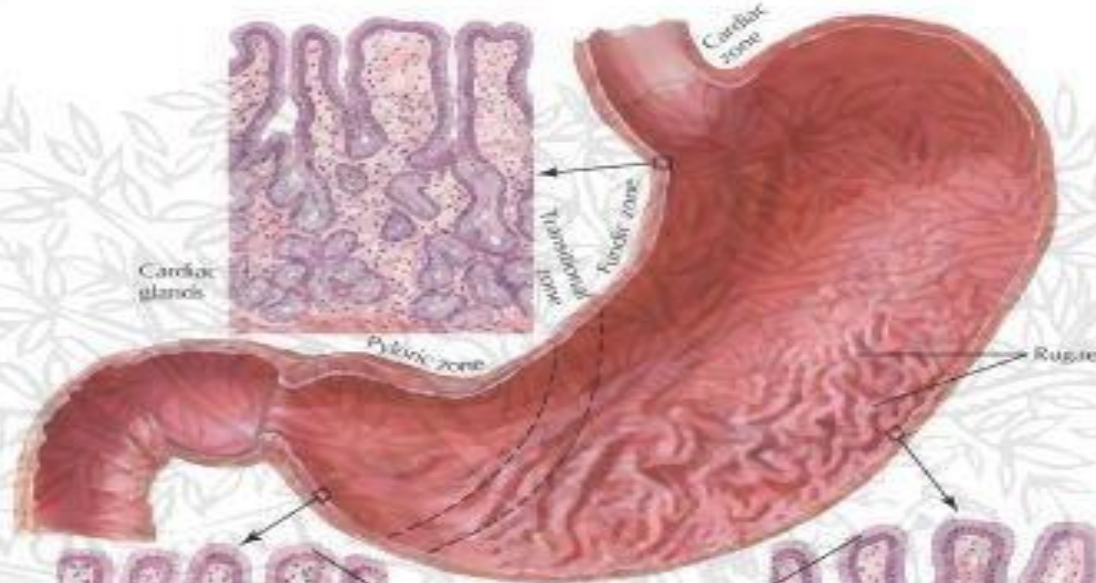
PYLORIC GLANDS : Consist of longer ducts. Lined by mucous secreting cells. Some cells secrete **GASTRIN.**

MUSCULARIS MUCOSA : Smooth muscle fibres form inner circular and outer longitudinal.

- **MUSCULARIS EXTERNA:** OUTER LONGITUDINAL , MIDDLE CIRCULAR, INNER OBLIQUE
- CIRCULAR FIBERS ARE GREATLY THICKENED AT THE PYLORUS WHERE THEY FORM THE PYLORIC SPHINCTER.

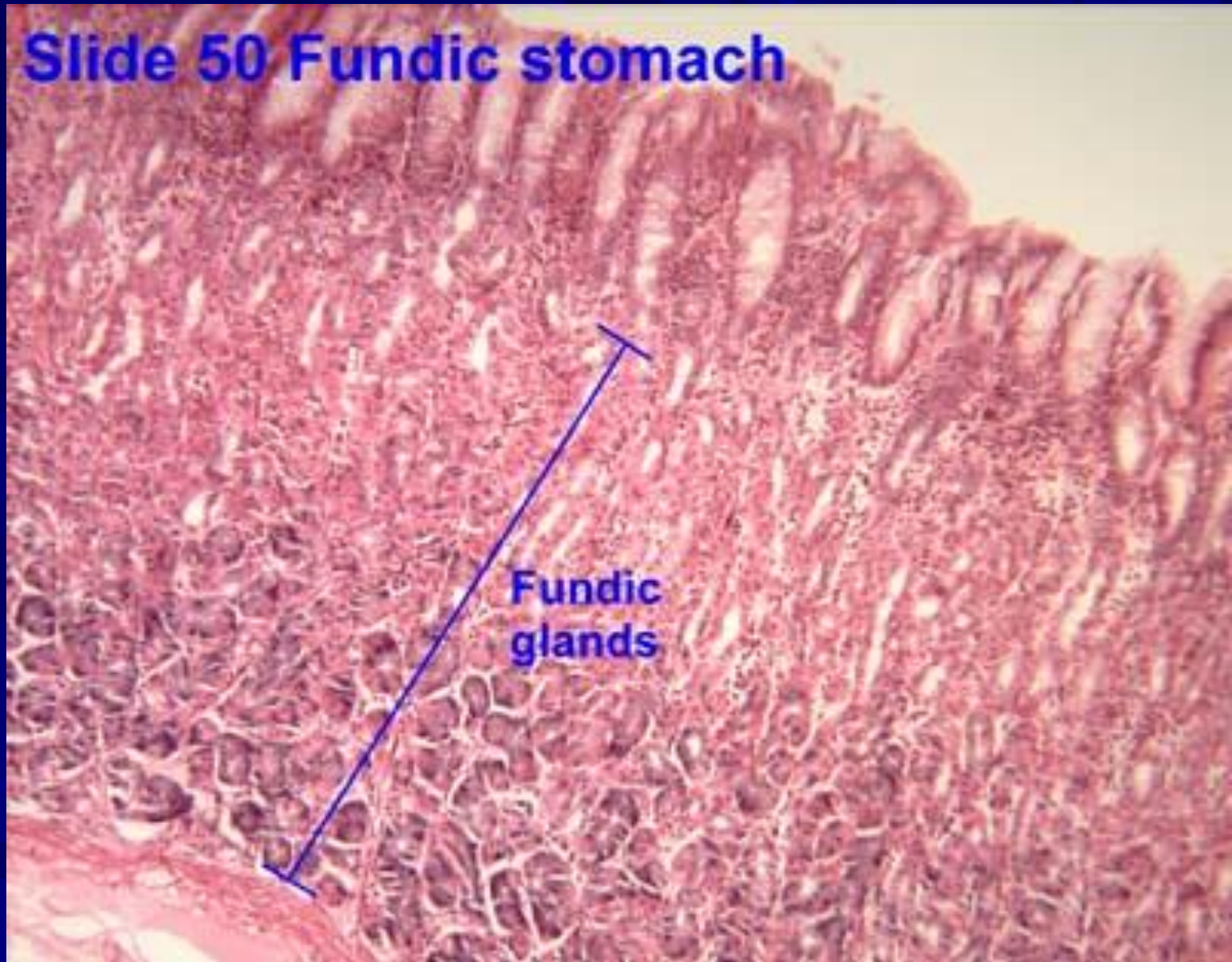


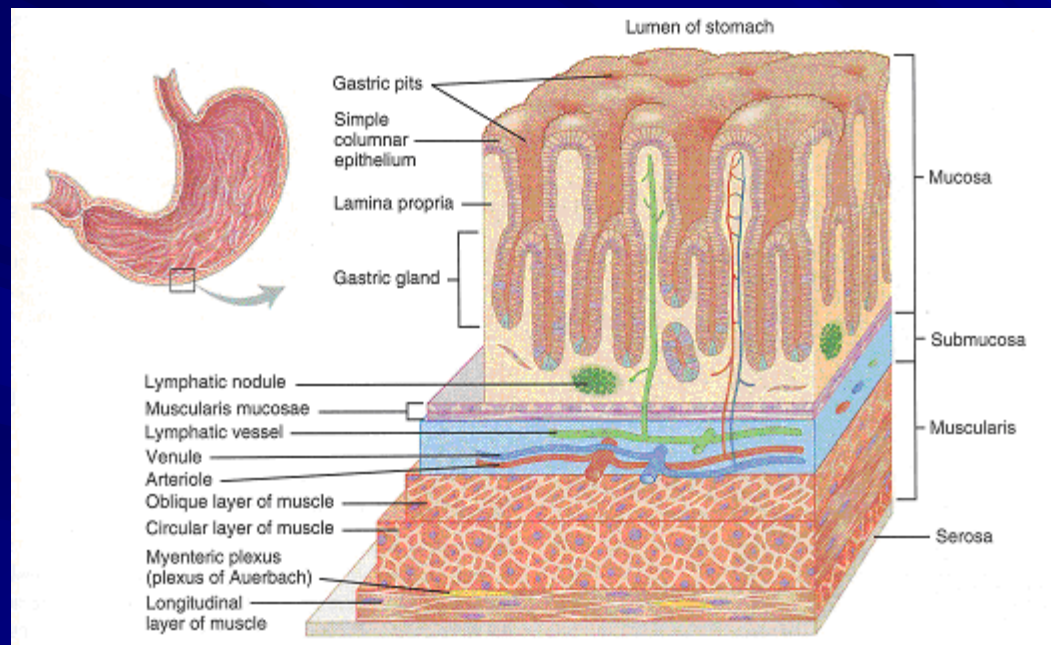


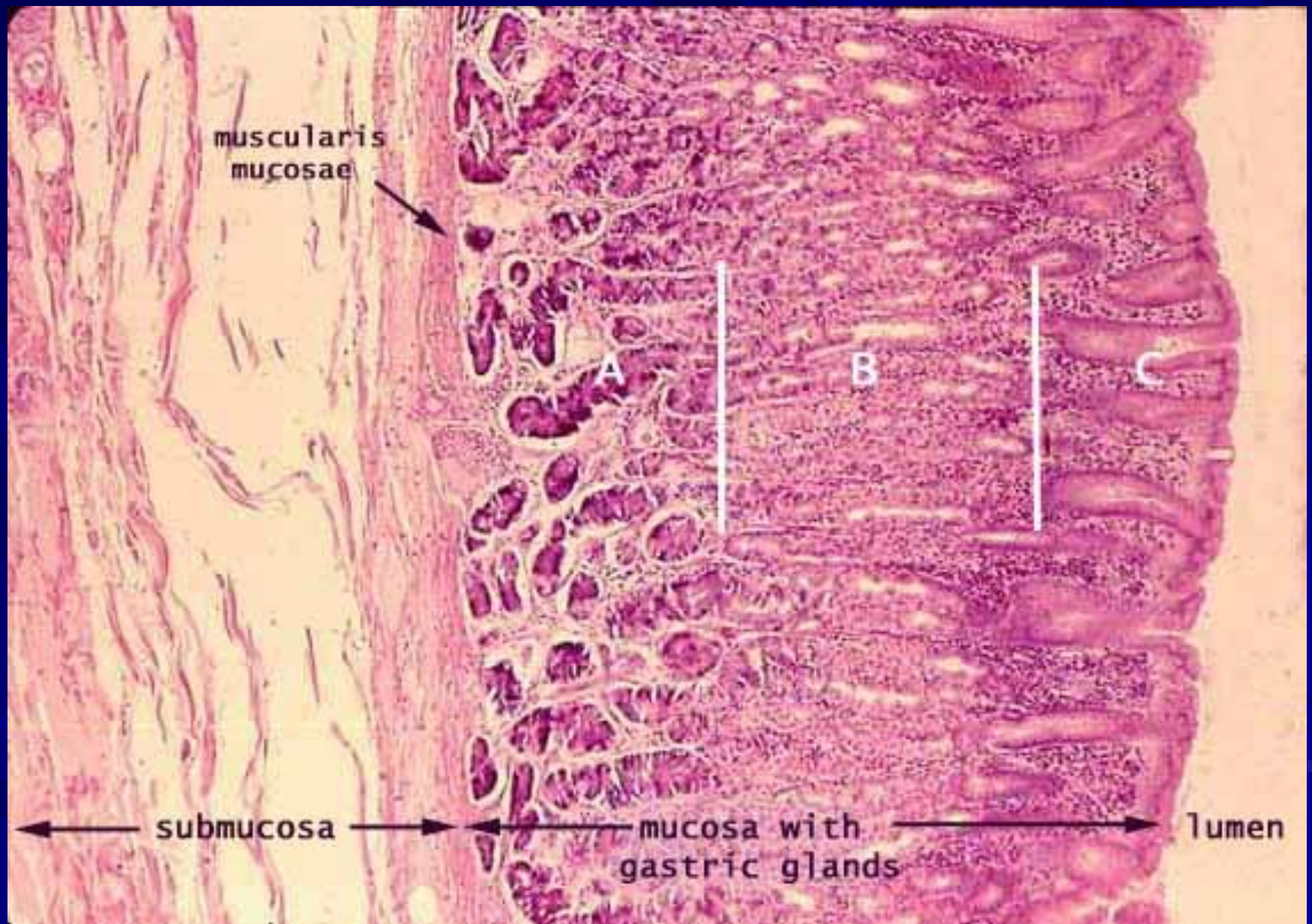


ELSEVIER

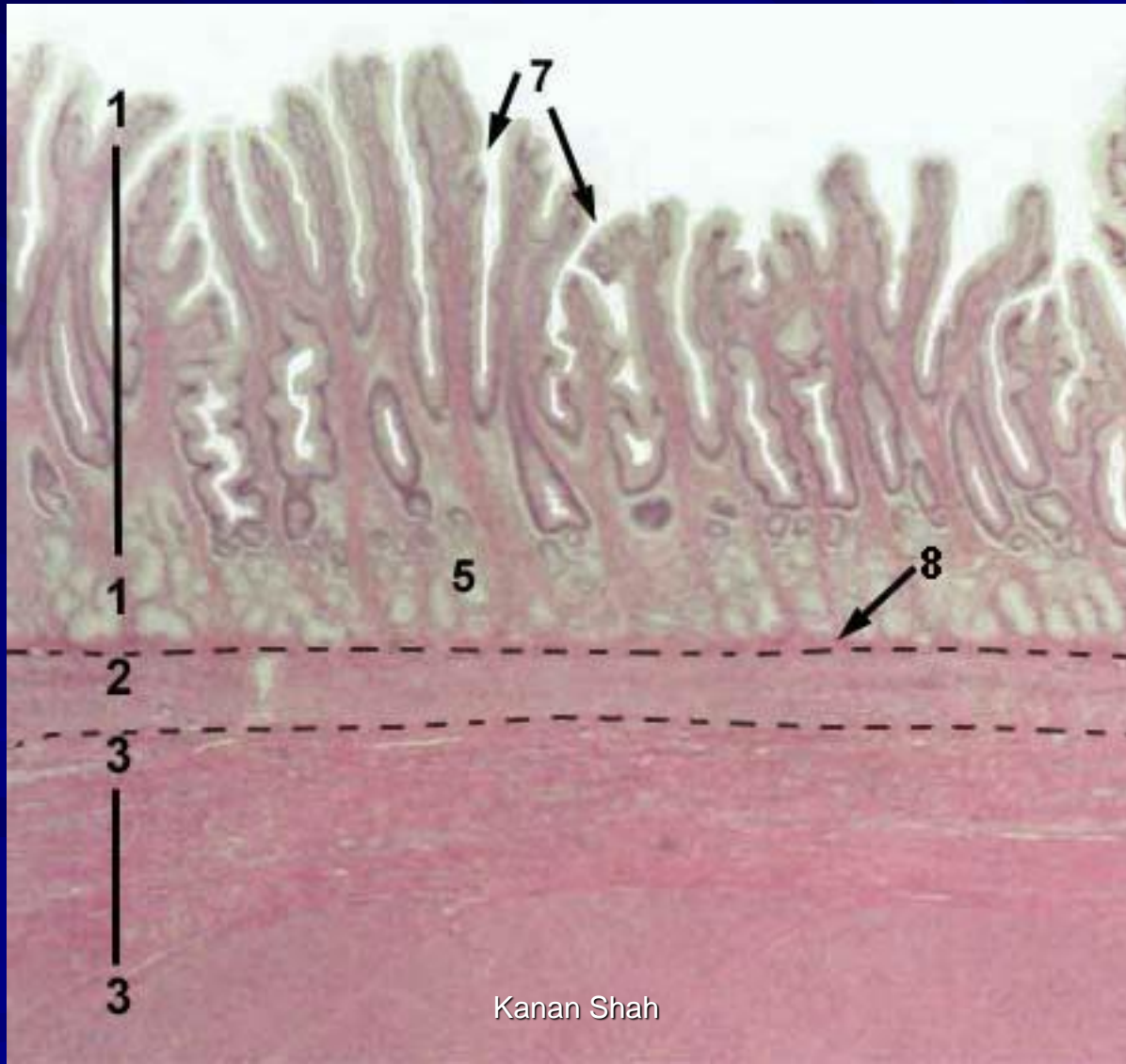
Slide 50 Fundic stomach



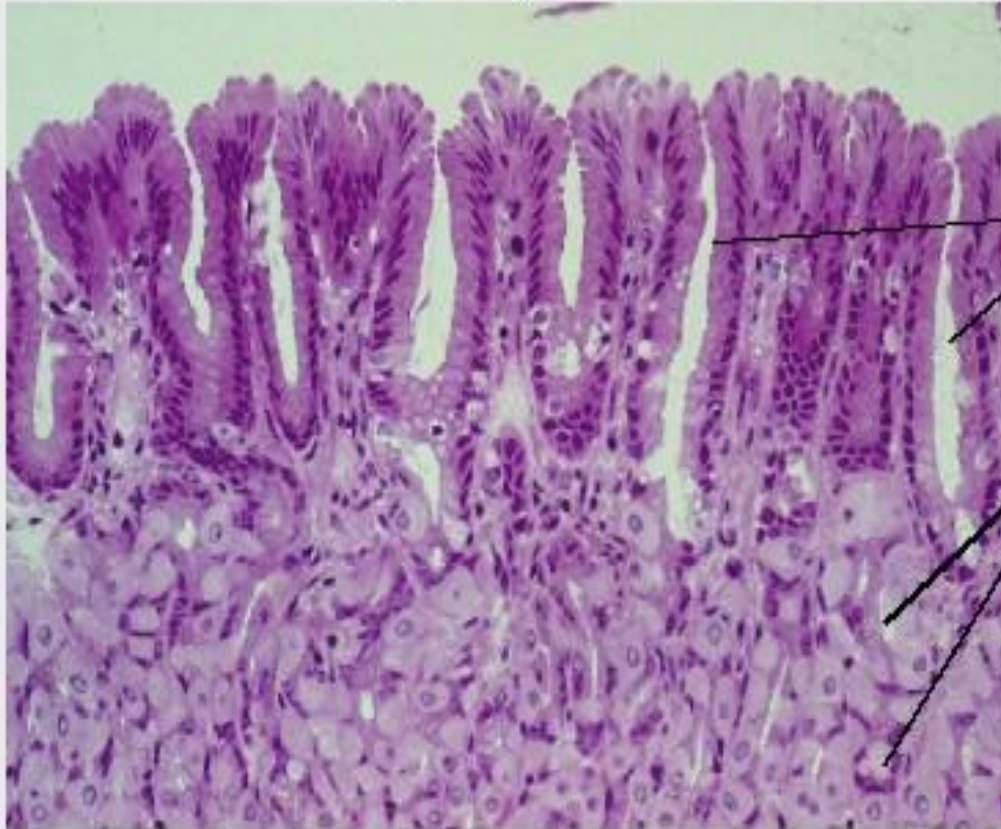




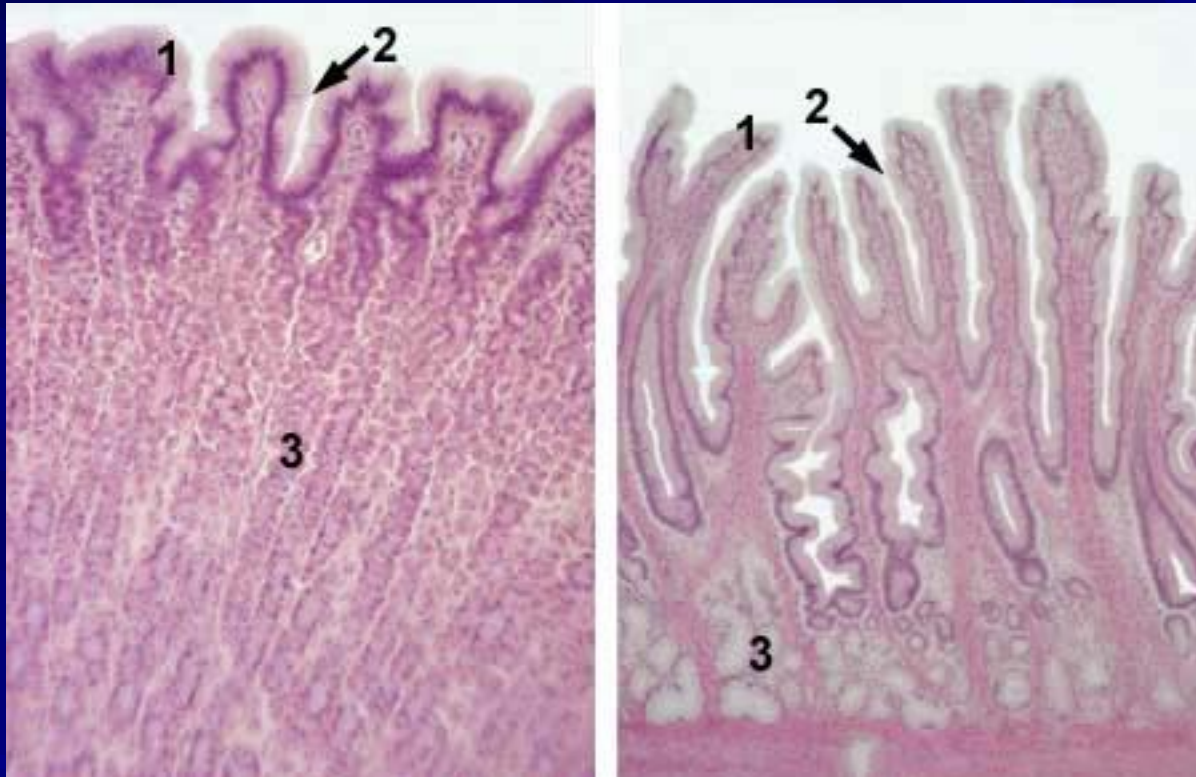




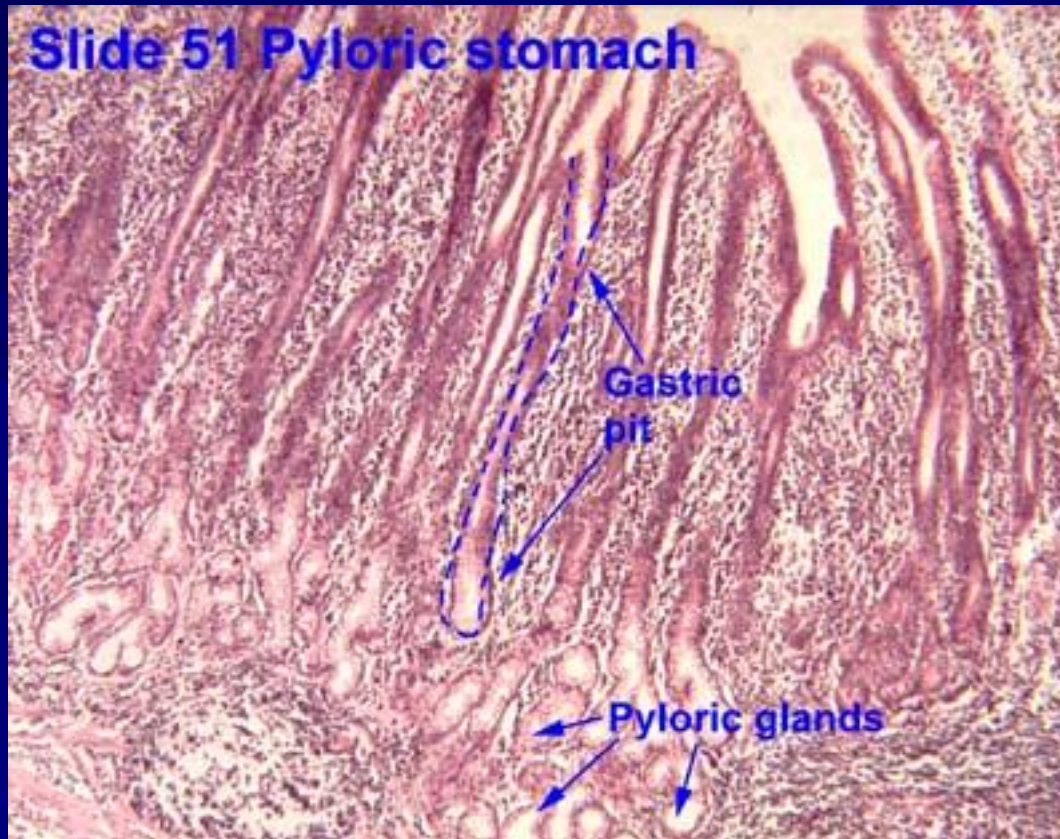
Body of the Stomach



Note the deep gastric pits and the numerous mucus-secreting glands. The cells seen in these glands are mucous secreting cells.



Slide 51 Pyloric stomach



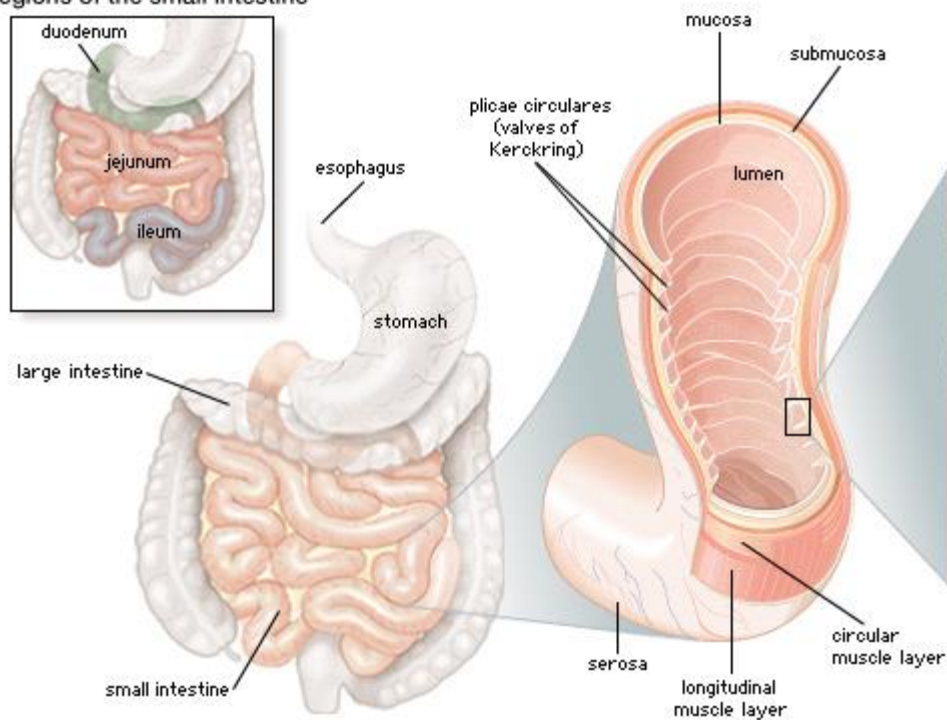
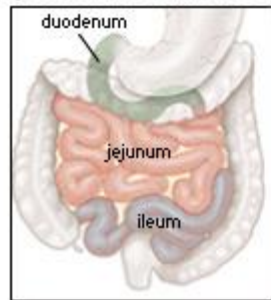
SMALL INTENSTINE

- **SEROSA , MUSCULAR , SUBMUCOSA , MUCOSA**
- **`MUCOSA : Presence of numerous circular folds in the mucosa.**
Presence of numerous finger like processes or villi.
Presence of microvilli on the luminal surfaces of the cells lining the mucosa.
Presence of numerous depressions called Crypts .
Circular folds are called valves of KERKRING , contain all layers of the mucosa.
EPITHELIUM – Columnar cells specialized for absorption
(Enterocytes) . Goblet cells are scattered amongst them . The crypts are lined
mainly by undifferentiated cells.PANETH CELLS secrete enzymes lie near the
bases of the crypts. (Zymogen cells).
Goblet cells are abundant in JEJUNUM & ILEUM.Mucous folds are less in ILEUM.
PEYER'S PATCHES are present in lamina propria of ILEUM.

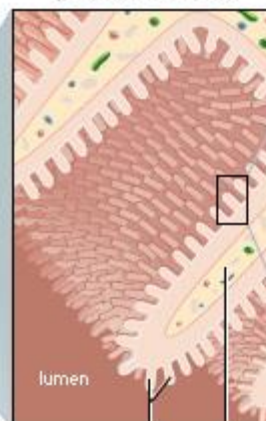
SUBMUCOSA :Consist of loose areolar tissueand contain plexuses of blood vessels, lymphatics , Meissner's plexus of nerves. In duodenum contain **BRUNNER 'S GLAND.**(compound racemose in type.)secrete fluid rich in Bicarbonate ions and an enzyme.

- **MUSCULAR COAT :** outer longitudinal and inner circular contain nerve plexus (Aurbach or Myenteric).
- **SEROSA :** Derive from peritoneum.

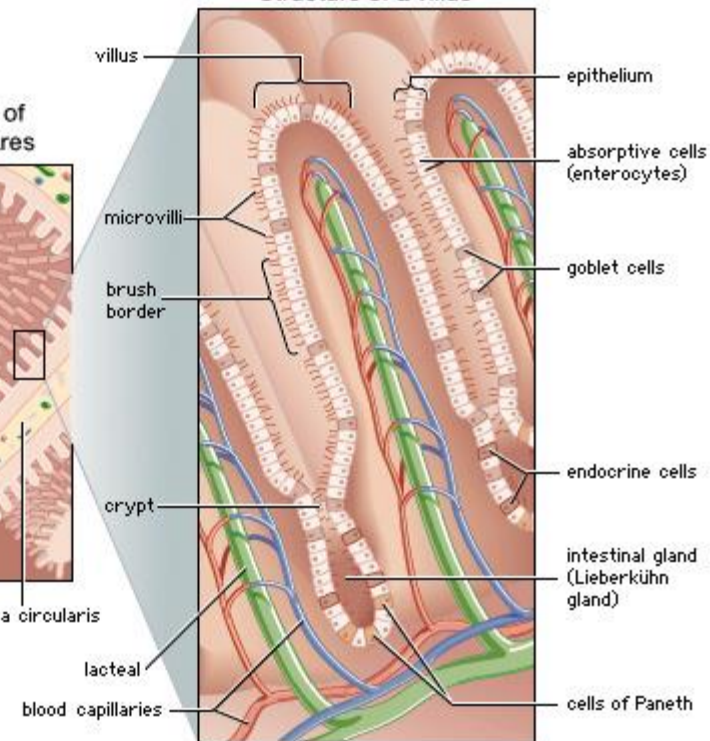
Regions of the small intestine



Enlargement of plicae circulares

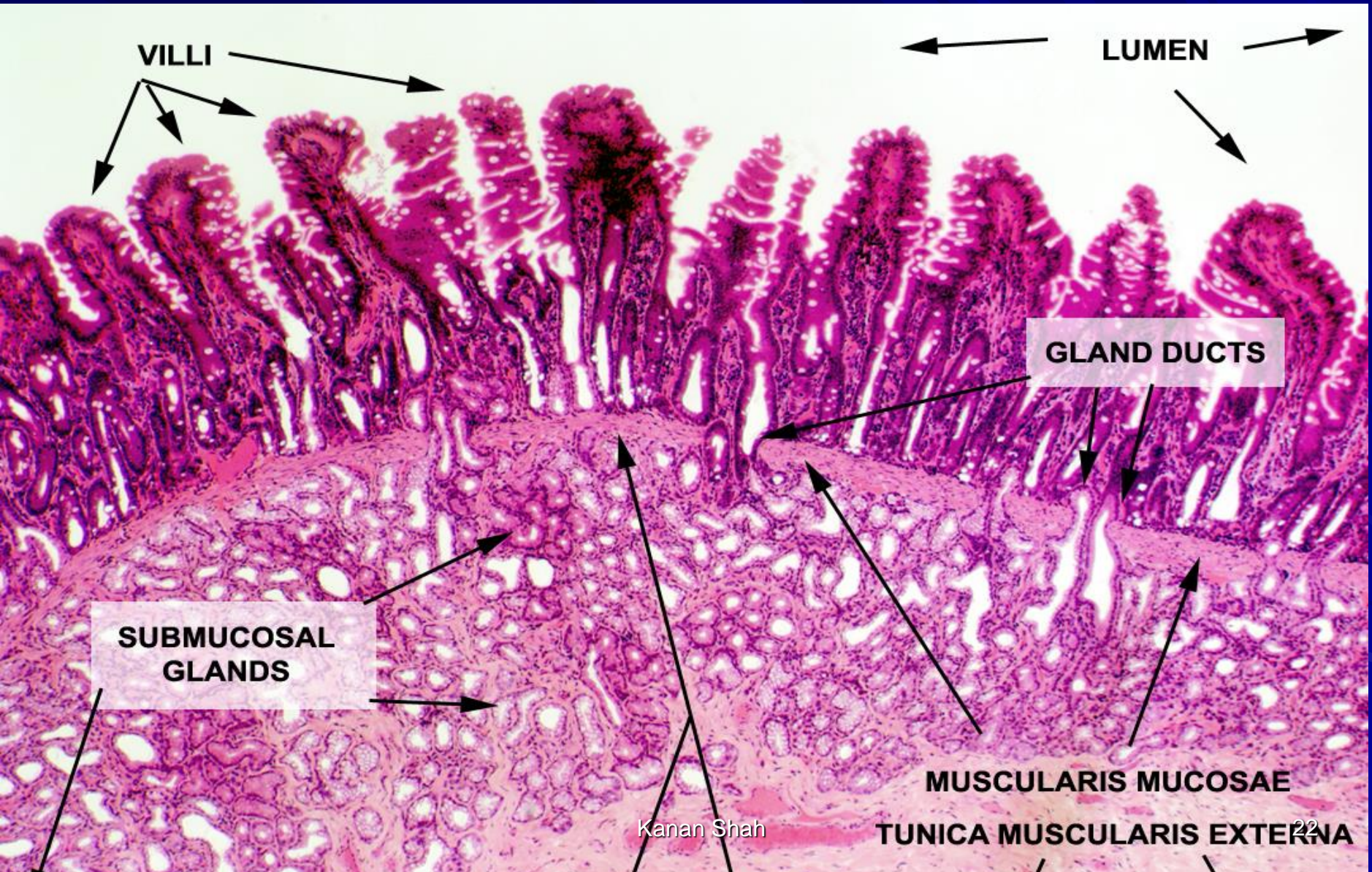


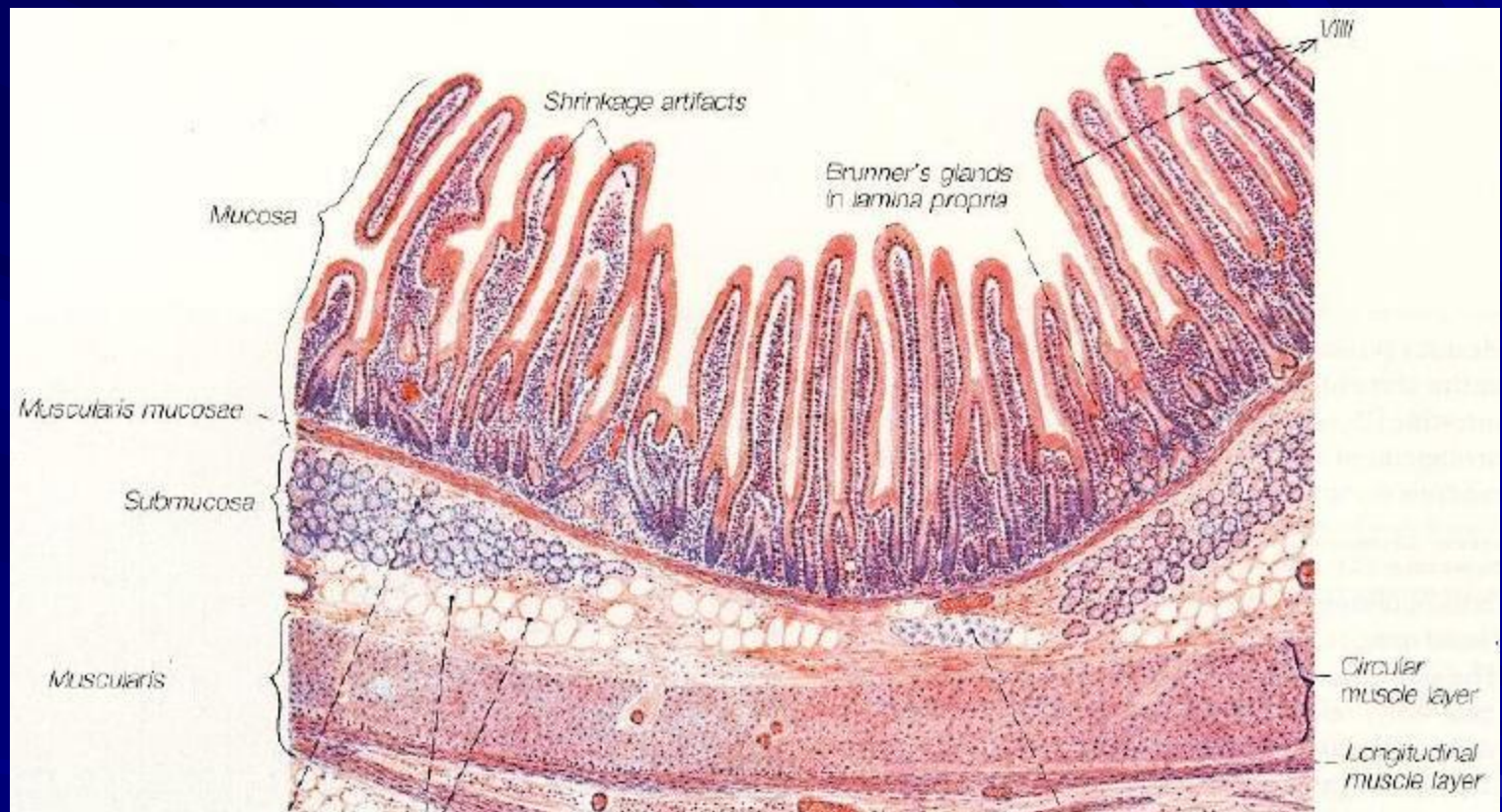
Structure of a villus



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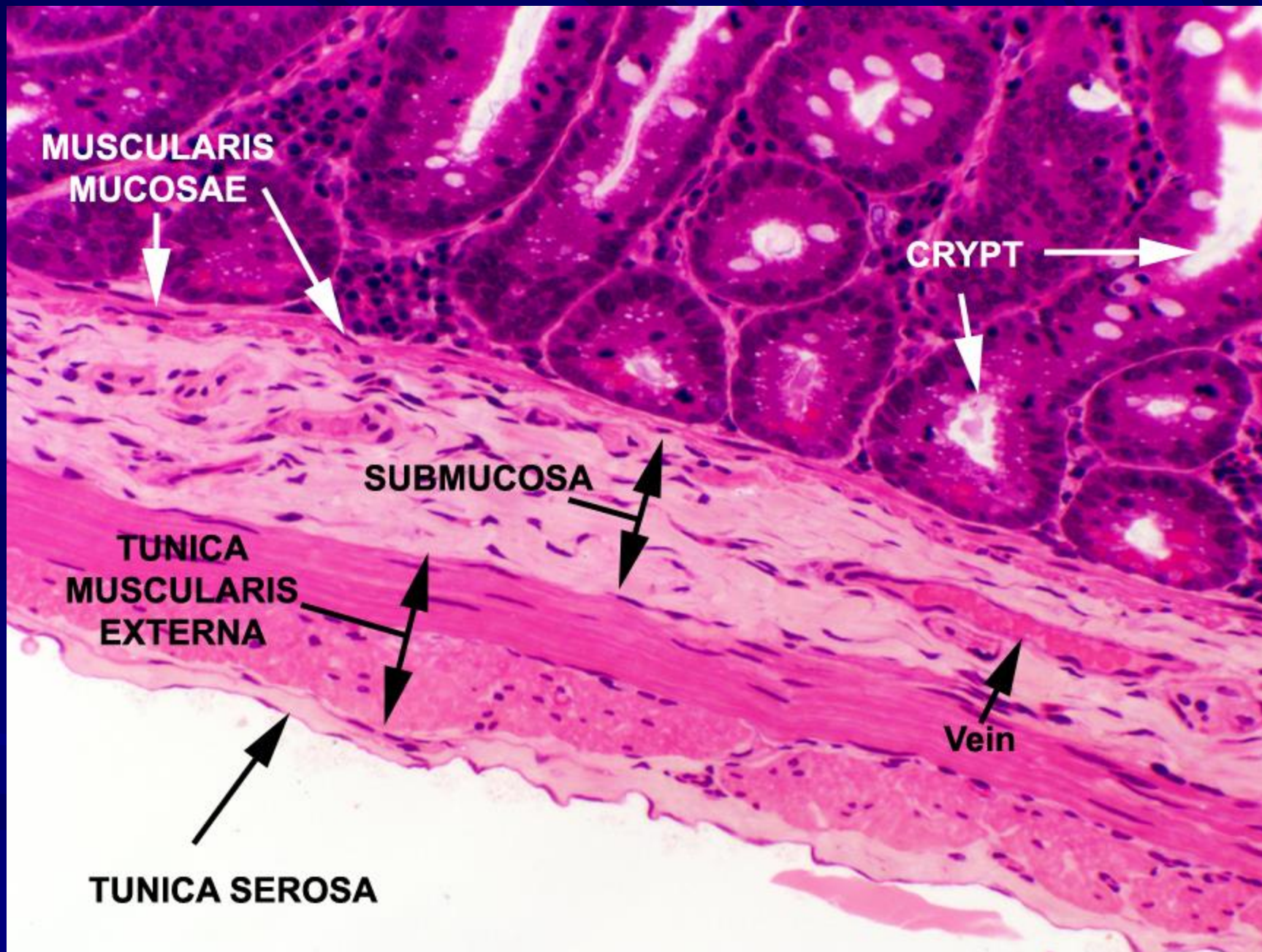
DUODANUM



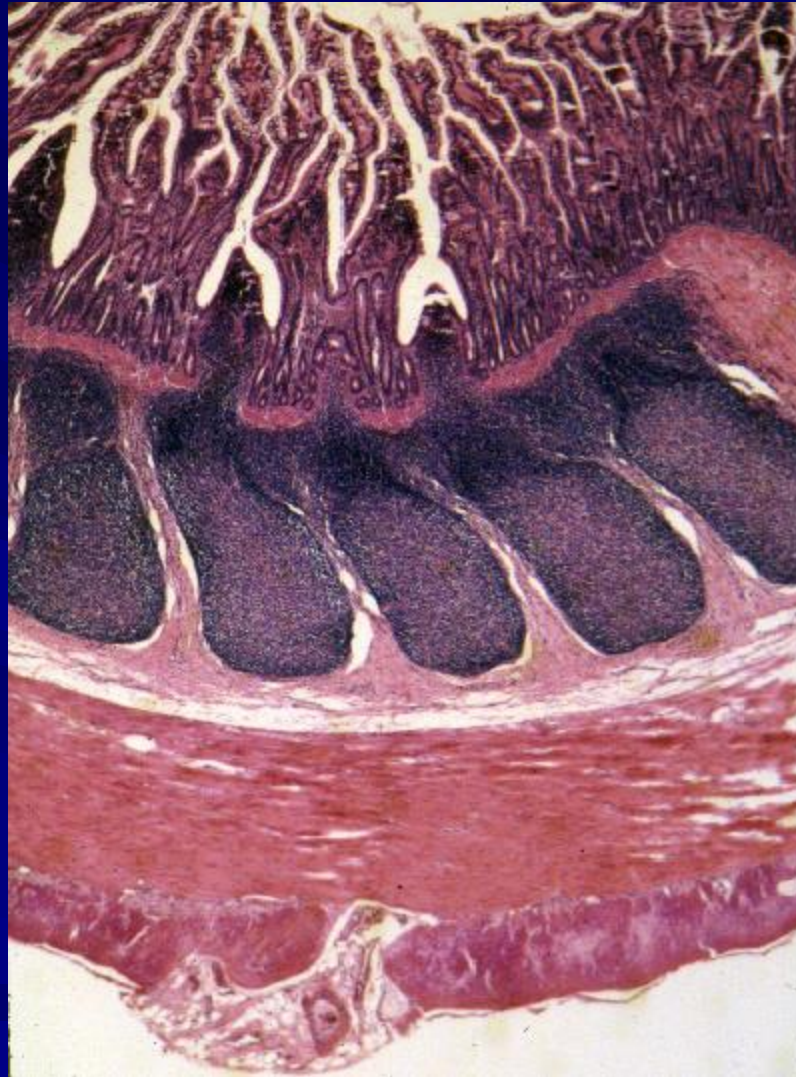


JEJUNUM



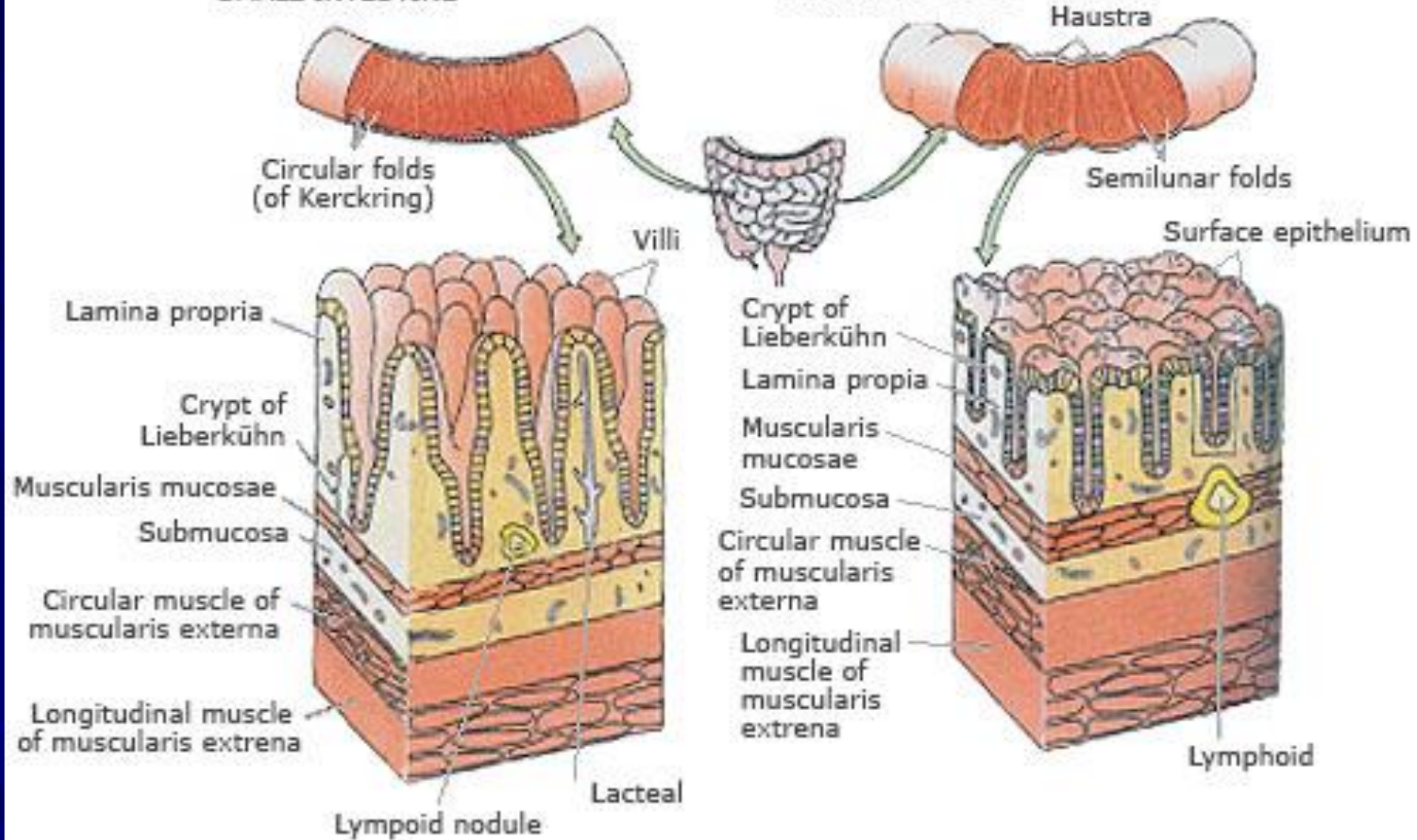


PEYER'S PATCHES



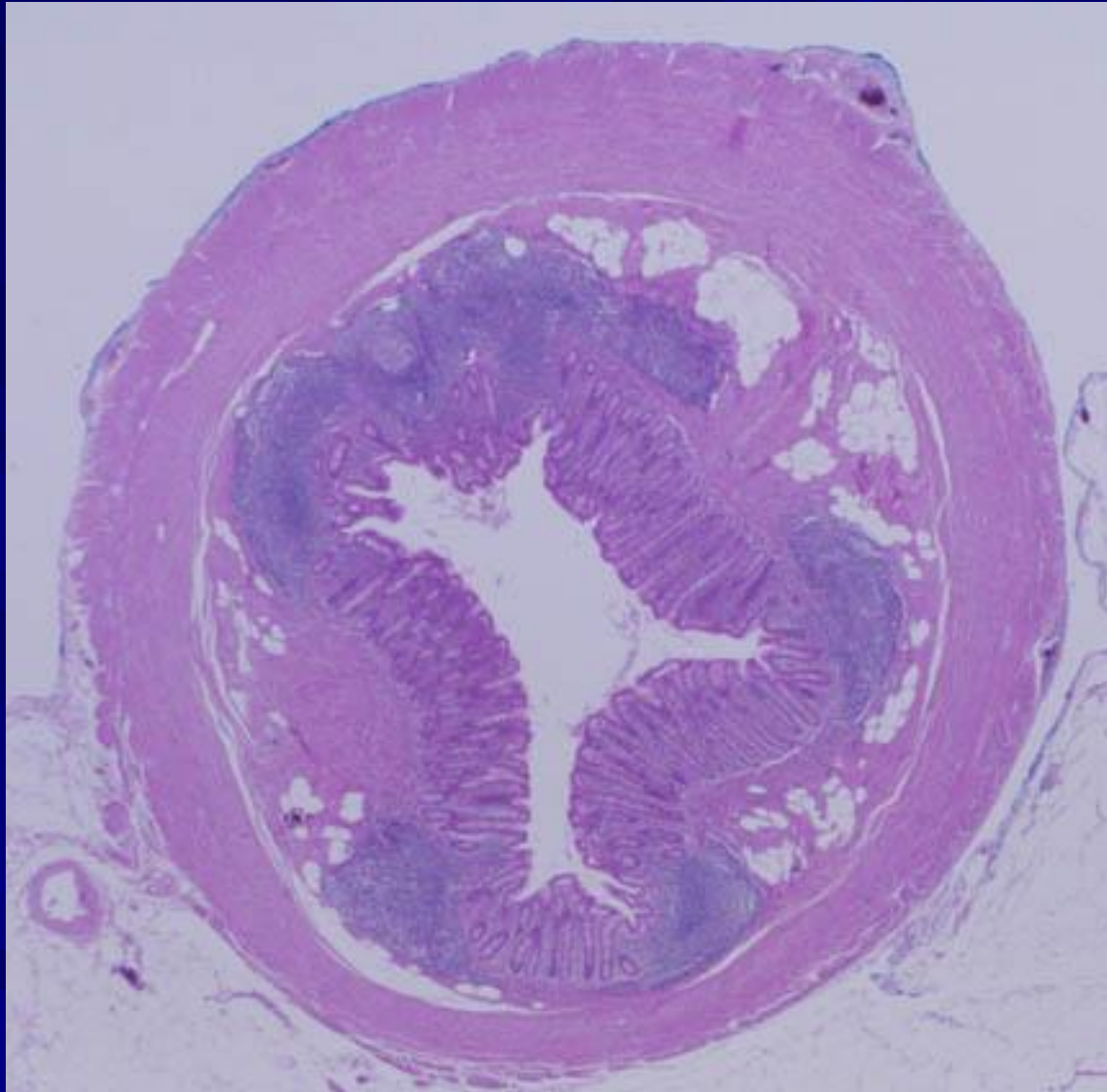
SMALL INTESTINE

LARGE INTESTINE



APPENDIX

- SEROSA : PERITONEUM
- MUSCULAR COAT : Outer longitudinal and inner circular layer of smooth muscle. HIATUS MUSCULARIS.
- SUBMUCOSA : loose areolar tissue and numerous lymphatic follicles. (ABDOMINAL TONSIL).
- MUCOSA : Devoid of villi.



Aknowledgement

- Inderbir Singh's Textbook of Human Histology
- Textbook of Histology- Atlas and Practical Guide by JP Gunasegaran
- Difiore's Atlas of Histology
- Images from Google
- Histology Text & Atlas -Brijeshkumar