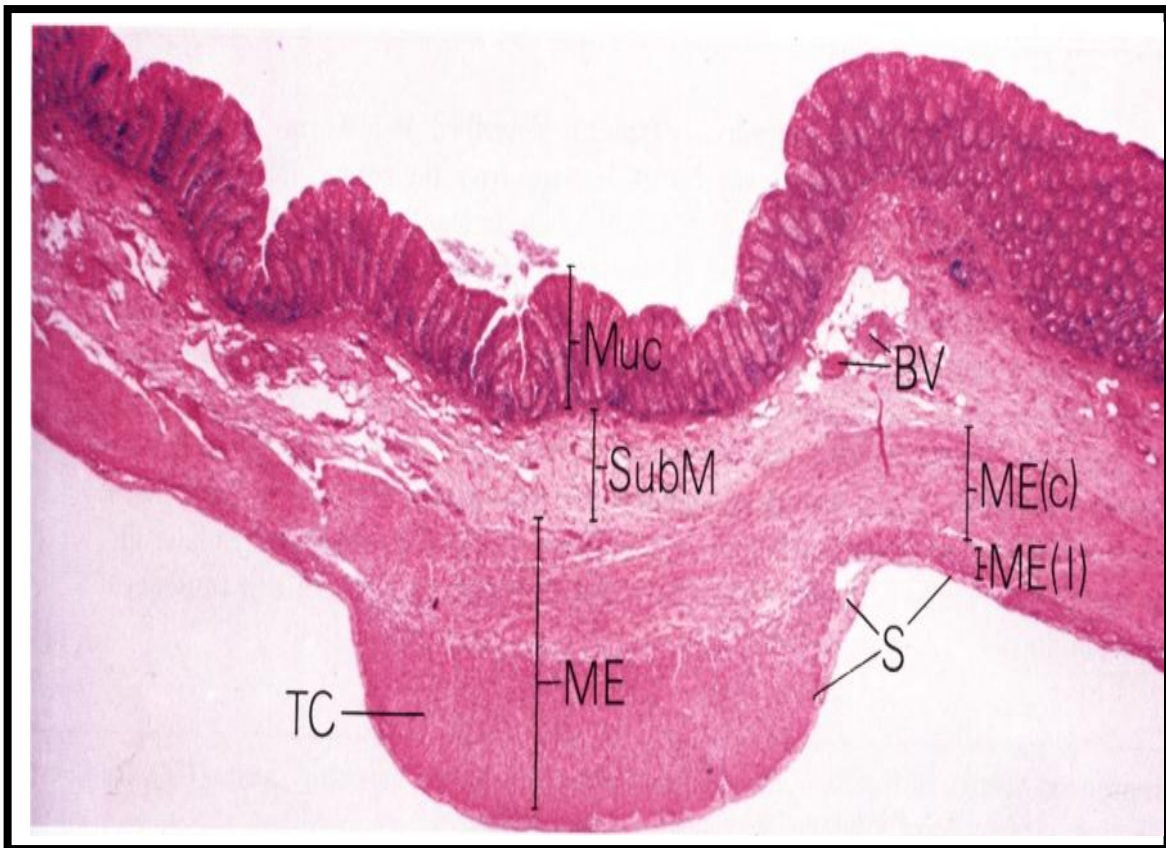


## VII -Large intestine

Is composed of the, *colons ( ascending , transverse , and descending ) , rectum , appendix , cecum and anal canal .*

### *Colon*

- **Mucosa** , presents no specialized folds . It is thicker than that of the small intestine .  
*Epithelium* , simple columnar ep. , has goblet cells and columnar cells.  
*Lamina propria* , the crypts of Lieberkuhn are longer than that of the small intestine .  
*Muscularis externa* , is composed of the inner circular and outer longitudinal layers of smooth muscle .
- **Submucosa** , resembles that of ileum.
- **Muscularis externa** , is composed of the inner circular and outer longitudinal layers of smooth muscle . outer longitudinal smooth muscle is modified into *teniae coli* , *three flat ribbons of longitudinally arranged smooth muscle* , auerbach 's plexus occupies its position between the two layers .
- **Serosa** , is posses both serosa and adventitia, serosa presents small , *flat-filled pouches* , the *appendices epiploicae* .

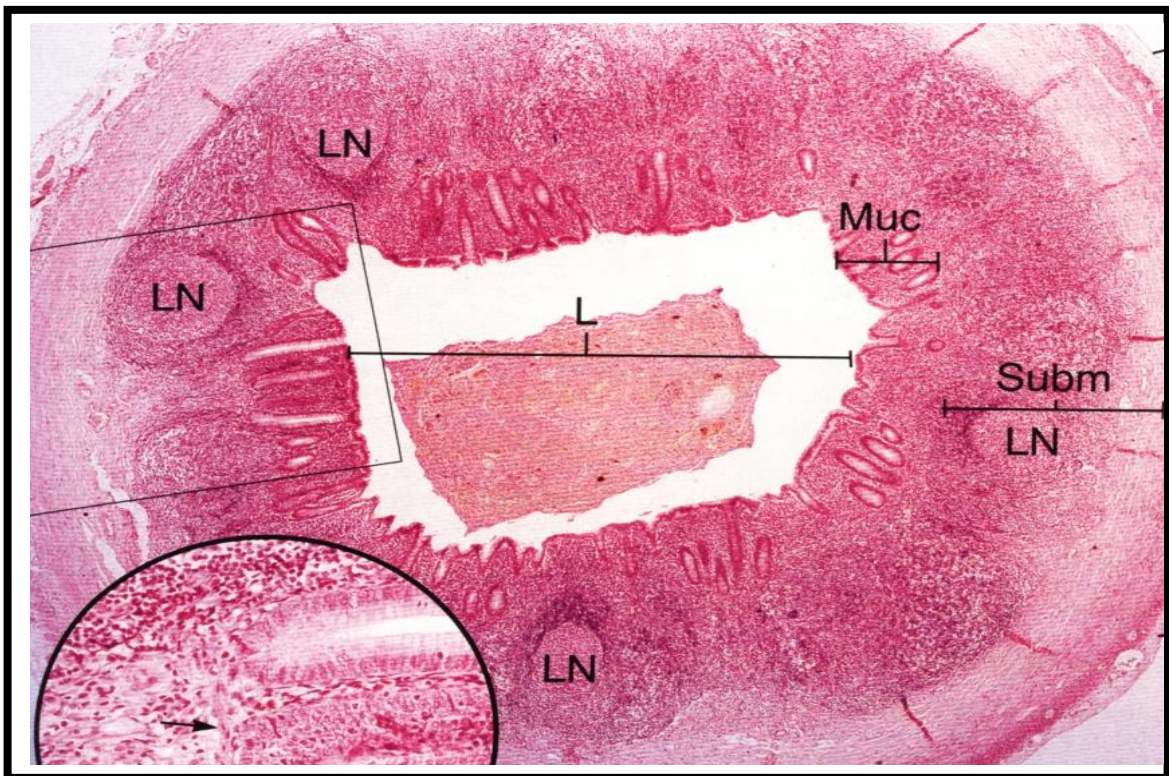


**MUC:** mucosa, **MM:** muscularis mucosa, **SubM:** submucosa, **ME:** muscularis externa  
**S:** serosa

### **Appendix** (vermiform)

The lumen of the appendix is usually stellate shaped , the simple columnar epithelium covers a lamina propria rich in lymphatic nodules and some of crypts of Lieberkuhn .

The muscularis mucosae , submucosa, and muscularis externa conform to the general plan of the digestive tract . It is covered by a serosa .



**SM:** submucosa, **ME:** muscularis externa, **LN:** lymphatic nodule, **L:** lumen ,**S:** serosa

### **Anal canal**

Presents longitudinal folds , **anal valves** , the epithelium changes from the simple columnar of the rectum , to simple cuboidal at the anal valves , to stratified squamous at the anus .

The submucosa is rich in vascular supply , while the muscularis externa forms the internal anal sphincter muscle , an adventitia connects the anus to the surrounding structures .

## ***Digestive glands***

The major glands are located outside the wall of the alimentary canal but are connected to the lumen of the digestive tract via ducts . These glands include the *major salivary glands, liver, pancreas* and *gallbladder*.

### ***1- Major salivary glands***

The three major salivary glands , parotid, submandibular , and sublingual, deliver their secretion ,*saliva*, into the oral cavity

### ***2- Liver***

Is the largest mass of glandular tissue in the body and also is the largest internal organ consists of lobules , the parenchymal cells of the liver , known as *hepatocytes* which organized as plates separated by *sinusoids* .A liver lobule schematically diagramed as a six sided polyhedral prism with *portal canals* containing inside interlobular branches of:- (hepatic artery , portal vein , and bile duct) at each of the corners , and in the center of each lobule a *central vein* .The hepatic sinusoids are lined with two types of cells:

***1-Endothelial cells*** , they are small in size and only the nucleus is visible.

**2-Kupffer cells** , that are derived from monocytes can be seen just in section that stains with india ink.

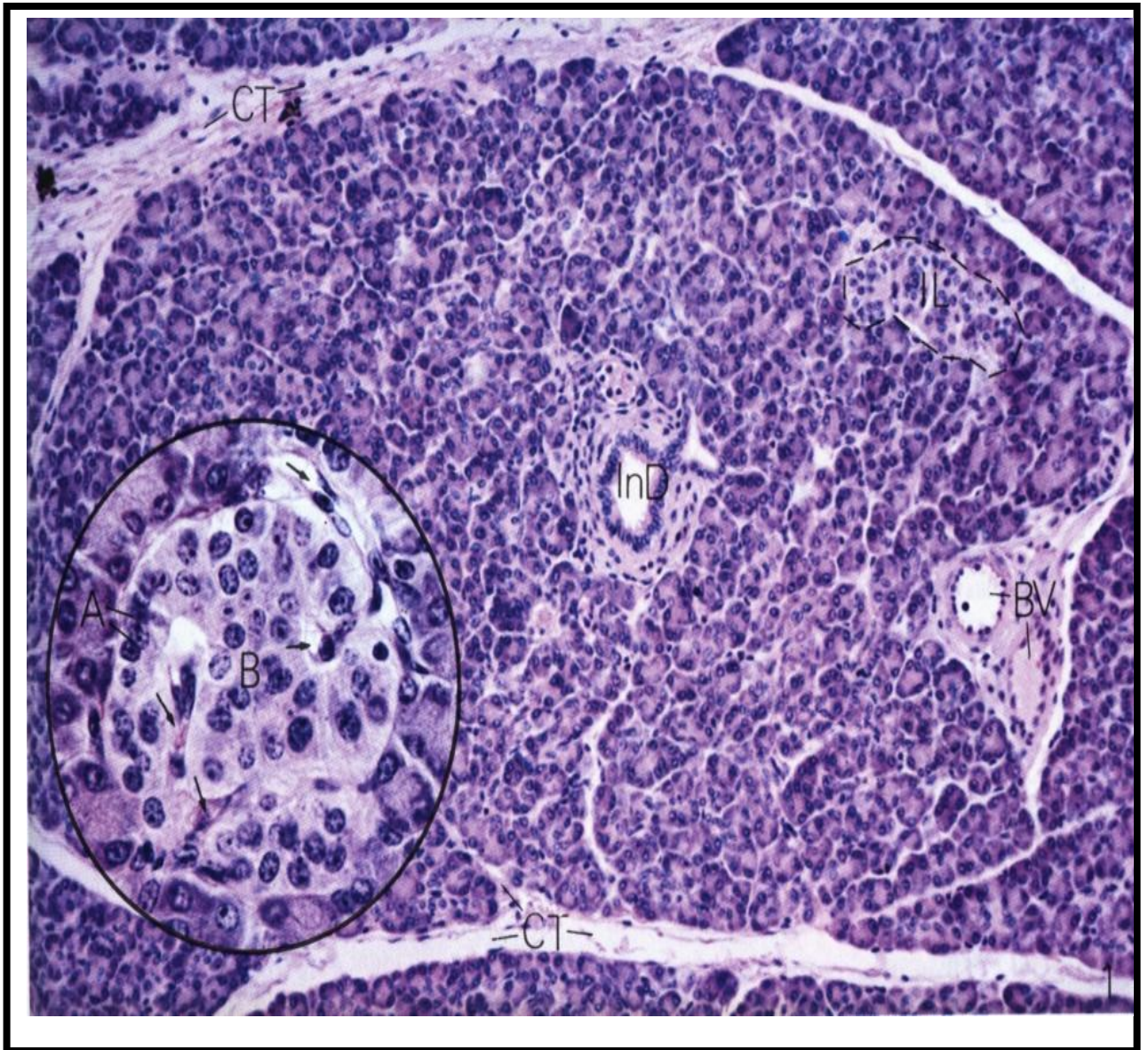


CV: central vein, BD: bile duct , HA: hepatic artery , PV: portal vein

### 3- Pancreas

Is a mixed gland , in that it has exocrine and endocrine functions .The endocrine part is composed of scattered spherical aggregates of richly vascularized cords of endocrine cells, known as *islet of Langerhans*, five cell types are present in these structures :  $\alpha$  (A) cells , producing glycogen ;  $\beta$  (B) cells , manufacturing insulin ; G cells ; producing gastrin ;  $\delta$  (D) cells , manufacturing somatostatin; and PP cells , secreting pancreatic polypeptide.

The exocrine pancreatic portion is a *compound acinar gland* , composed of several pyramidal serous cells surrounding a lumen , they have a spherical nucleus , and the apex of the cell stains with acidic dyes while the base stains with basic dyes.

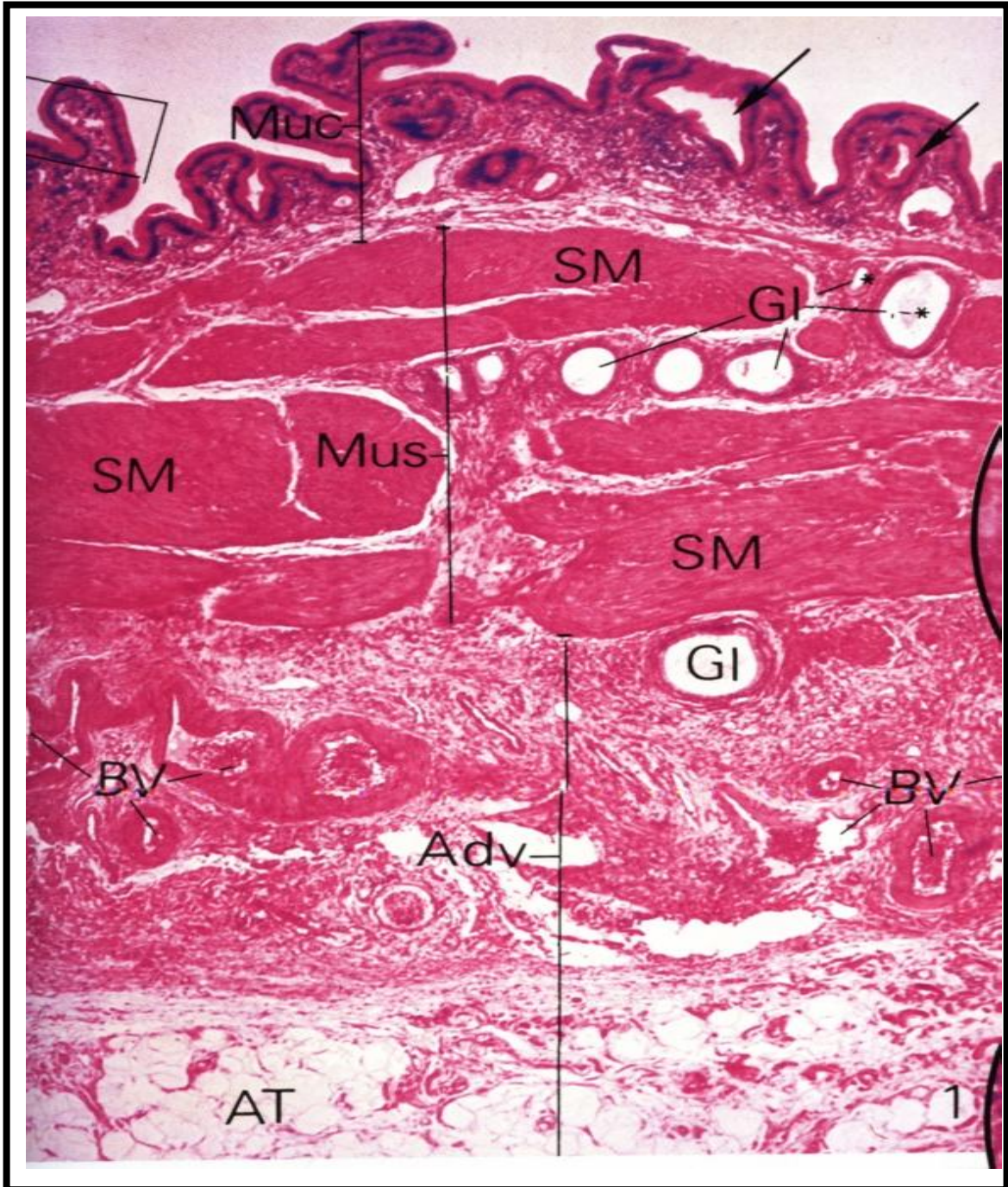


**CT:** connective tissue , **IL:** islets of langerhans, **InD:** intralobular duct, **B:** region of most B cell, **A:** region of most A cell

#### ***4-Gallbladder***

Is a small pear-shaped hollow organ attached to the postero-inferior surface of the liver , consists of *mucosa* , a simple columnar epithelium exhibit deep mucosal folds, the lamina propria rich in capillaries and small

venules, resemble that in colon, there is no well defined *submucosa* and *muscularis externa*, but a bundles of smooth muscle cells randomly oriented, then a thick layer of dense connective tissue, the *adventitia*.



**SM:** smooth muscle , **Muc :** mucosa , **Mus:** muscularis mucosa , **Adv:** adventitia  
**AT:** adipose tissue, **BV:** blood vessel, **Gl:** glands , **PC:** plasma cell