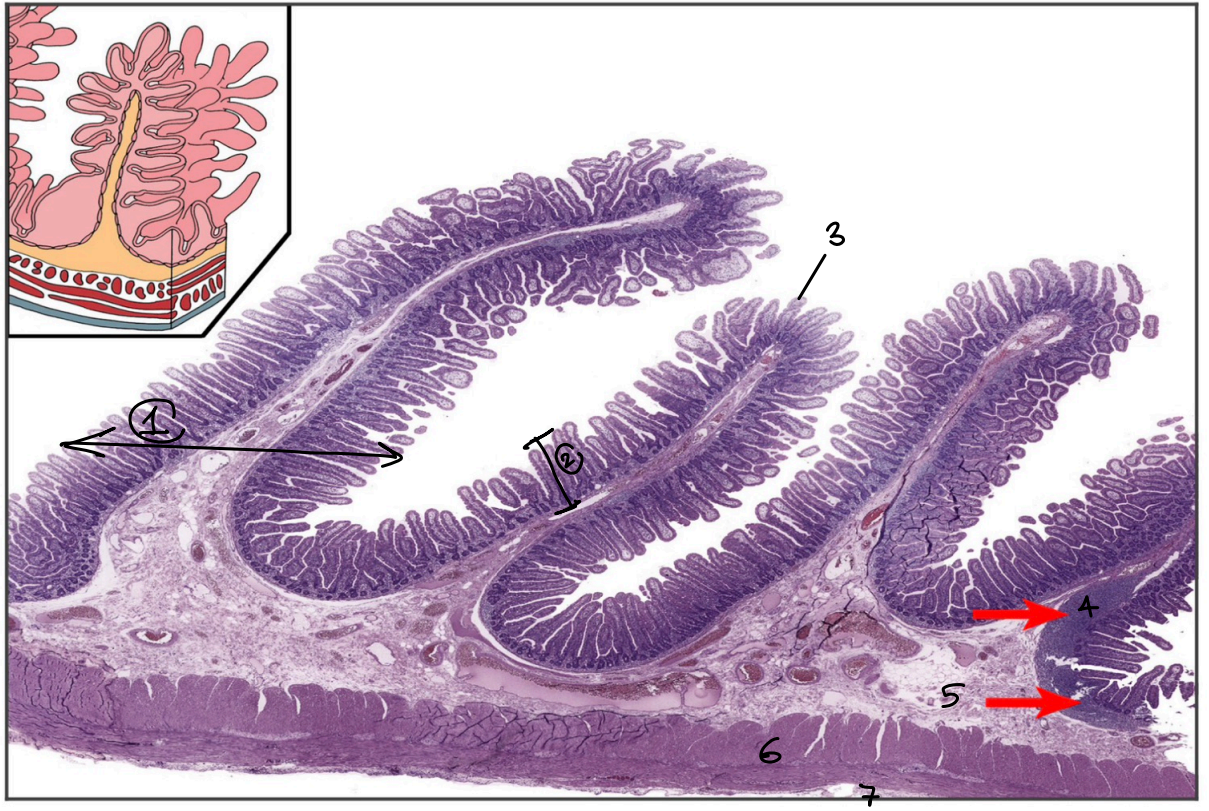
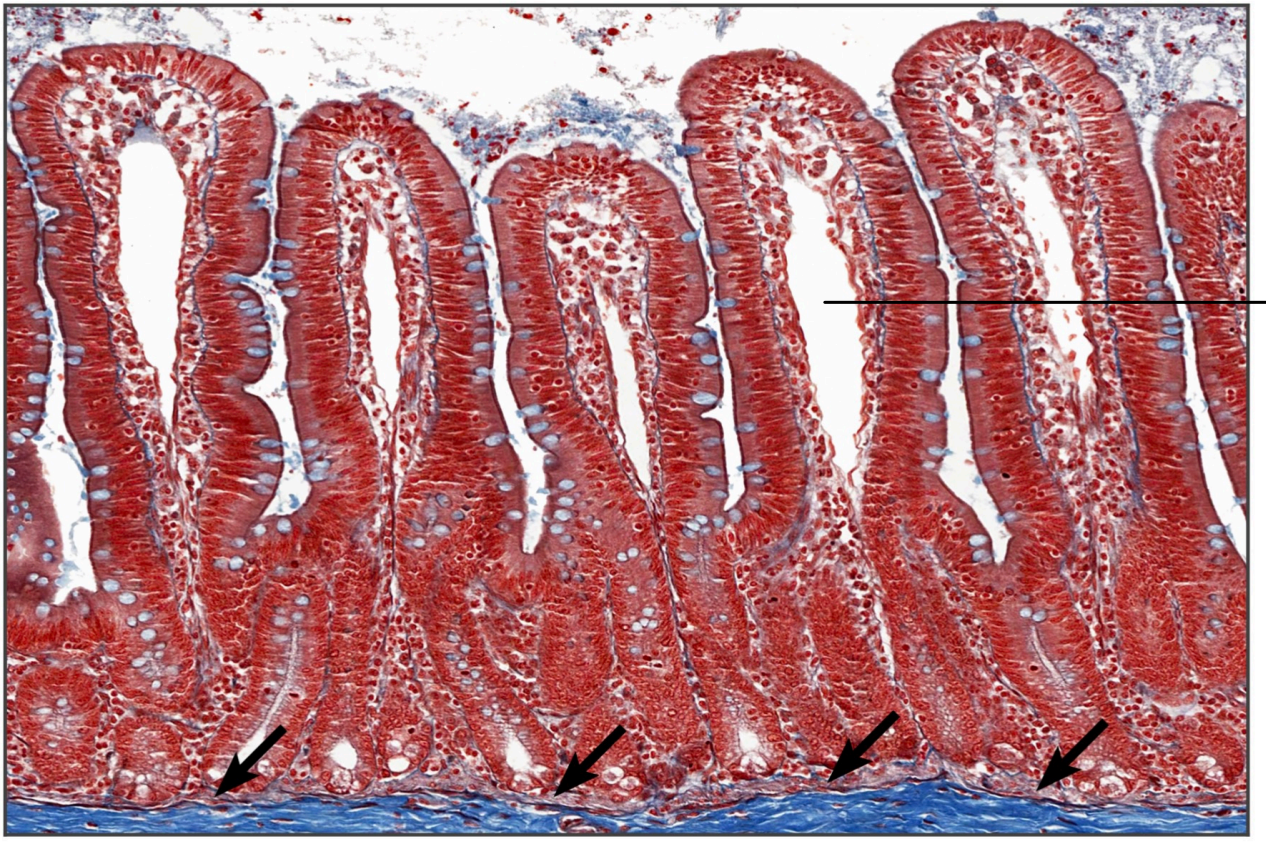

Extra practice !!

اللهم إني أبدأ دراستي بنية خالصة لك، فوفقني يا أرحم الراحمين، وارزقني التوفيق في كل ما أقرأ وأدرس، اللهم اجعل دراستي هذه سببًا لرفع درجتي في الدنيا والآخرة، وبارك لي في وقتي، وارزقني التوفيق في امتحاناتي ، اللهم اجعلني من الذين يسهل عليهم العلم، واجعل لي من كل صعوبة في الدراسة سهولة، ومن كل عائق في الطريق إزالة



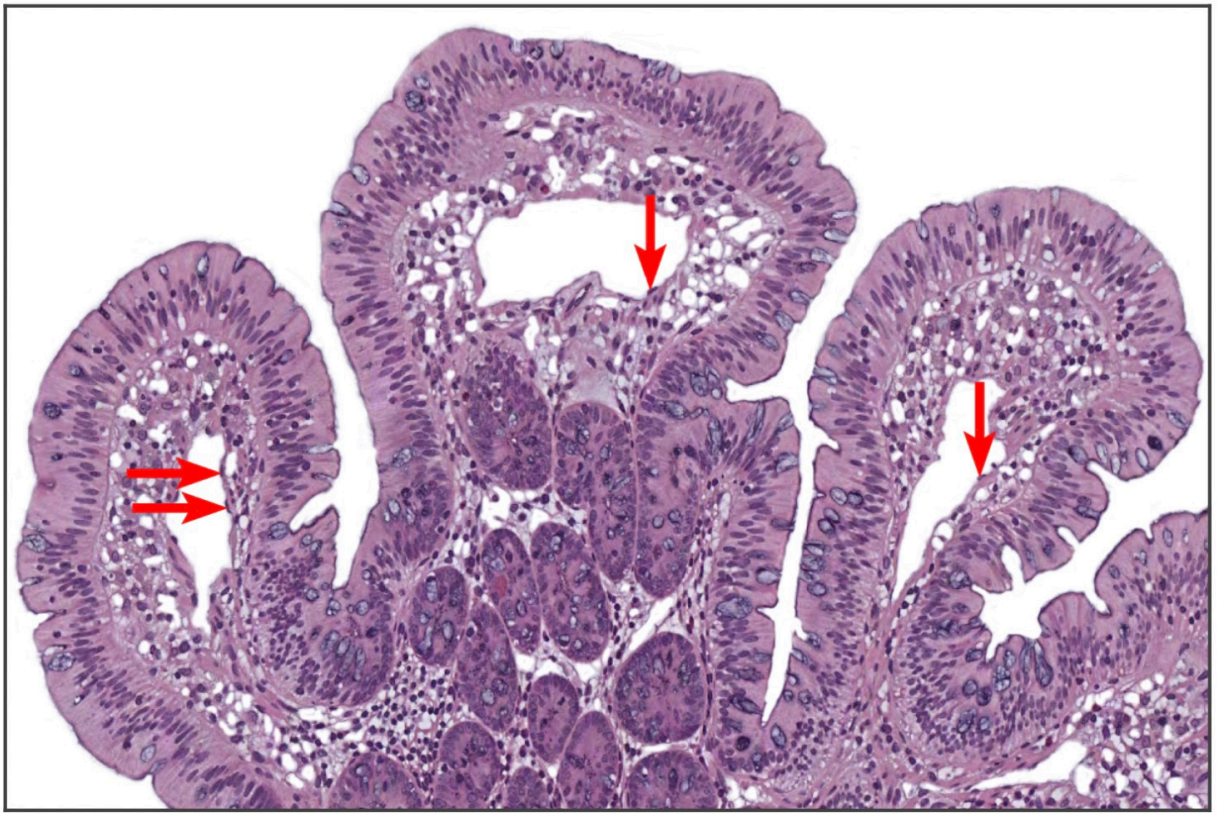
- MALT

Plica circulares are clearly shown in this longitudinal section of the jejunum. Plica circulares provide increased absorptive surface area for the intestine. They consist of circular folds comprised of a central core of submucosa covered by the mucosa with its villi and glands. The mucosa also contains collections of lymphoid tissues, referred to as mucosa-associated lymphoid tissue (MALT). Jejunum, 40x



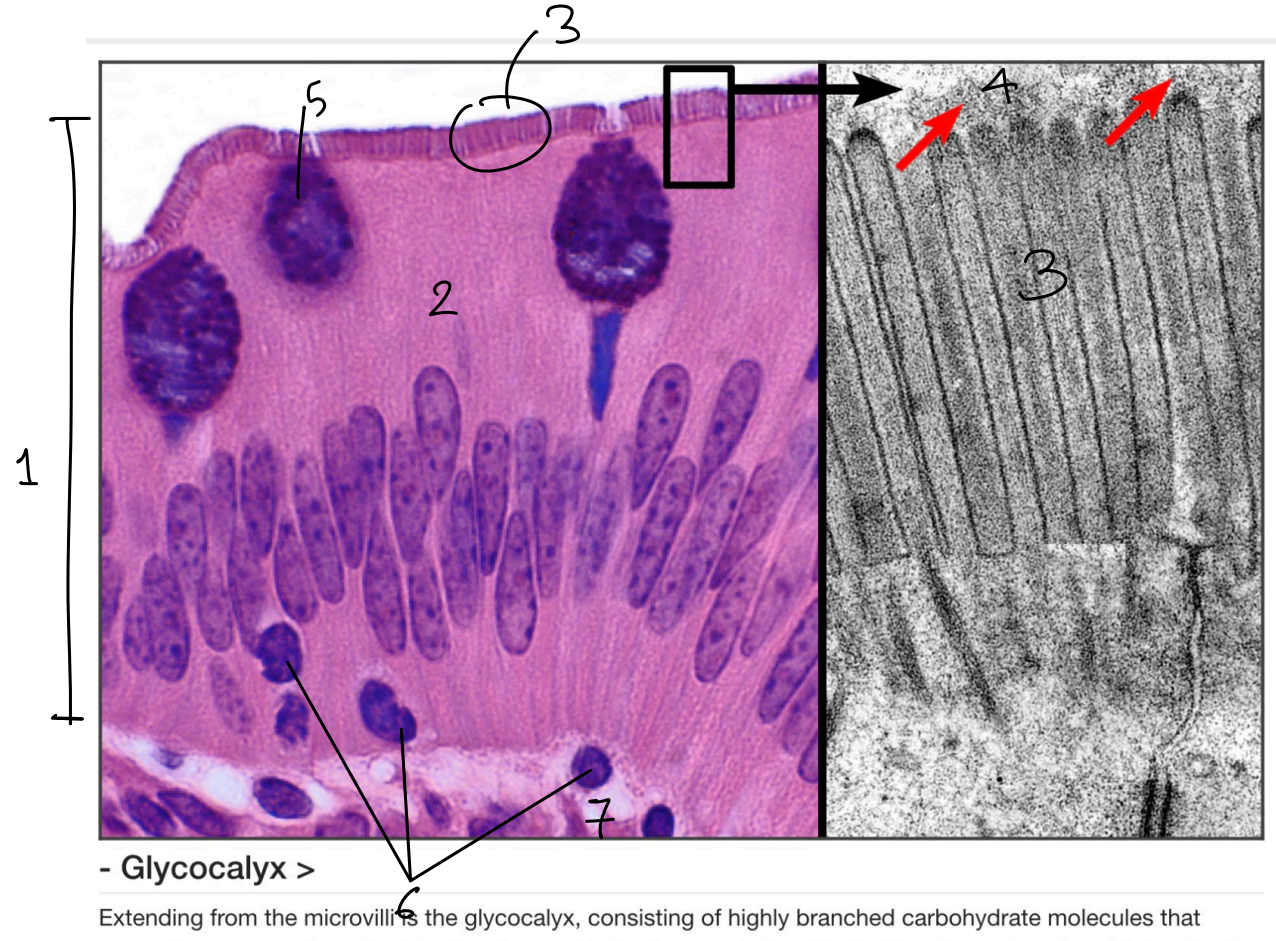
- Muscularis mucosae

Higher magnification of the mucosa shows its three components: a simple columnar epithelium of absorptive enterocytes and goblet cells; a lamina propria of loose connective tissue in which intestinal glands are located; and a thin muscularis mucosae of smooth muscle. Beneath the mucosa is the submucosa. Trichrome stain.



- Endothelium

Lacteals are lined by a simple squamous epithelium called endothelium.



- Main Slide
1. Epithelium
2. - Enterocytes
3. - Microvilli >
4. - Glycocalyx >
5. - Goblet cells >
6. - Lymphocytes and macrophages >
7. Lamina propria >

- Glycocalyx >

Extending from the microvilli is the glycocalyx, consisting of highly branched carbohydrate molecules that sequester enzymes important in digestion and in the transport of nutrients. The glycocalyx also aids in retention of the bacterial flora present in the intestinal lumen.

	Main Slide
1	Mucosa
2	- Villi
3	- Intestinal glands
4	- Paneth cells
5	- Lamina propria
6	- Muscularis mucosae
7	Submucosa

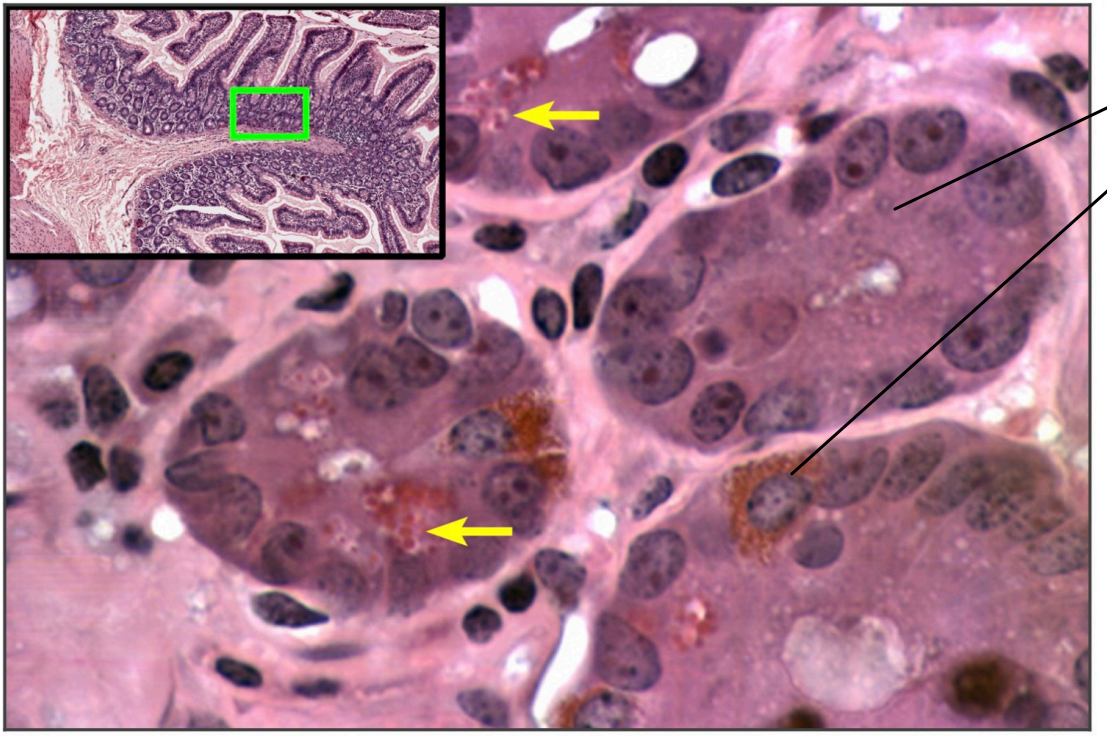
- Paneth cells

Epithelial invaginations into the lamina propria of the small intestine form the intestinal glands, also known as the glands or crypts of Lieberkuhn. The bases of these glands extend down to the muscularis mucosae. Intestinal glands contain goblet cells, absorptive cells, Paneth cells, enteroendocrine (DNES) cells and stem cells. 400x

Small intestine bc

1) Paneth cells

2) Villi & glands



Main Slide

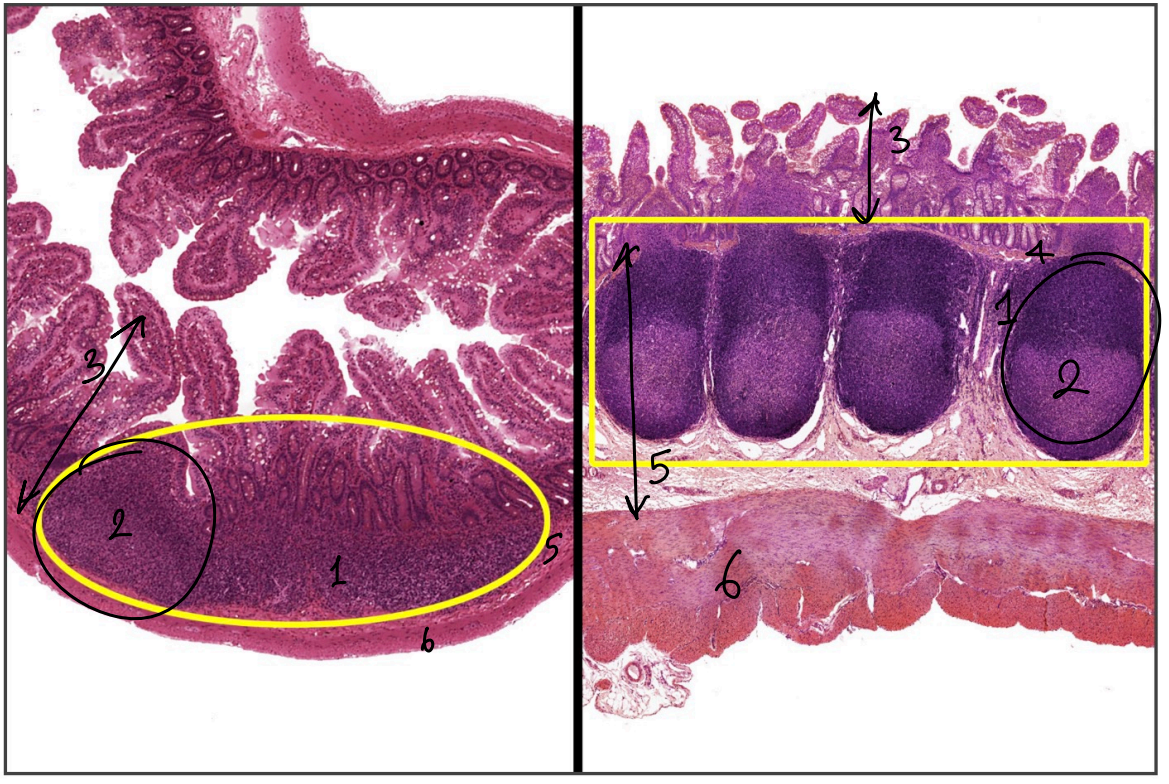
Intestinal glands

- Enteroendocrine cells

- Paneth cells

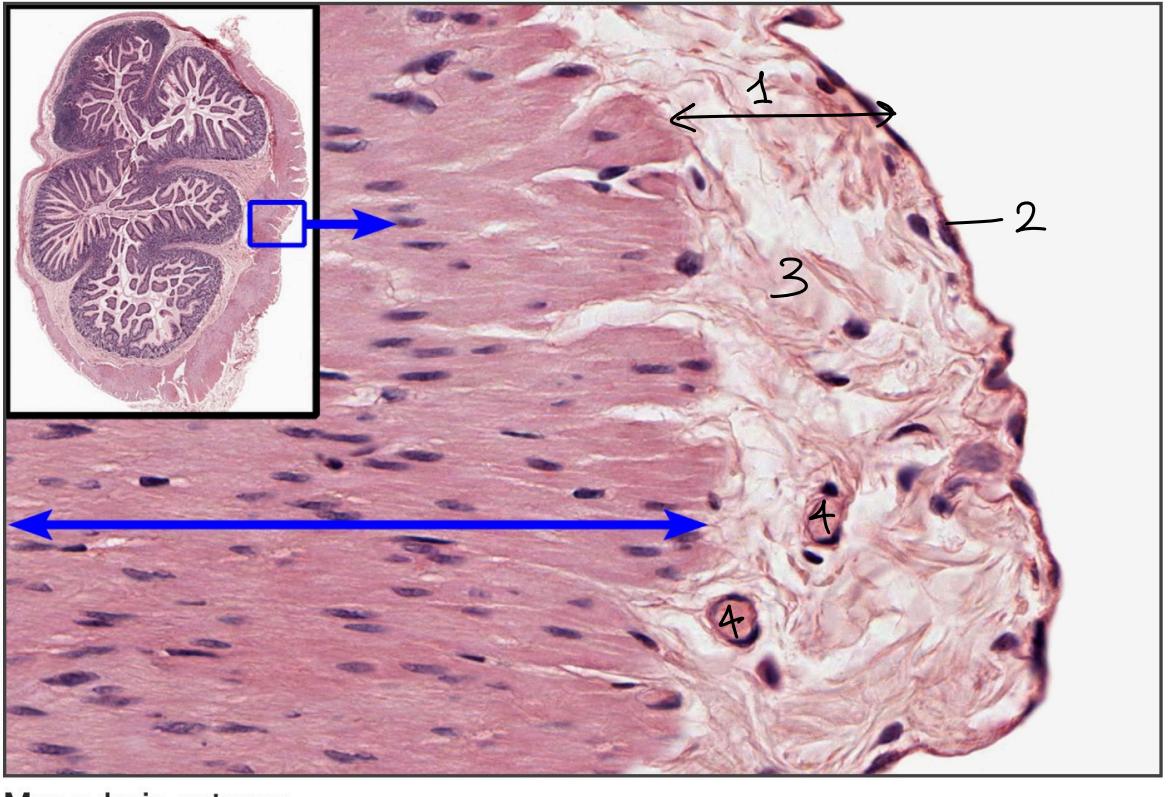
- Paneth cells

Intestinal glands, seen here in cross section, are formed by an epithelium composed of absorptive cells, goblet cells, Paneth cells, precursor cells and enteroendocrine (DNES) cells. Precursor (stem) cells replenish the supply of both the absorptive and goblet cells. When formed, these differentiated cells migrate up the intestinal glands and villi to be shed from the tips of the villi. Intestinal glands are surrounded by lamina propria. 100x, 1000x



Peyer's patch

Mucosa-associated lymphoid tissue (MALT) is present all along the length of the tubular digestive tract and consists of both diffuse and nodular lymphoid tissue. Large accumulations of MALT, Peyer's patches, are particularly prominent in the lamina propria of the ileum as shown in these images. Larger lymphoid nodules often extend into the submucosa. MALT filters tissue fluid, detecting foreign antigens and initiating an immune response. 50x, 10x

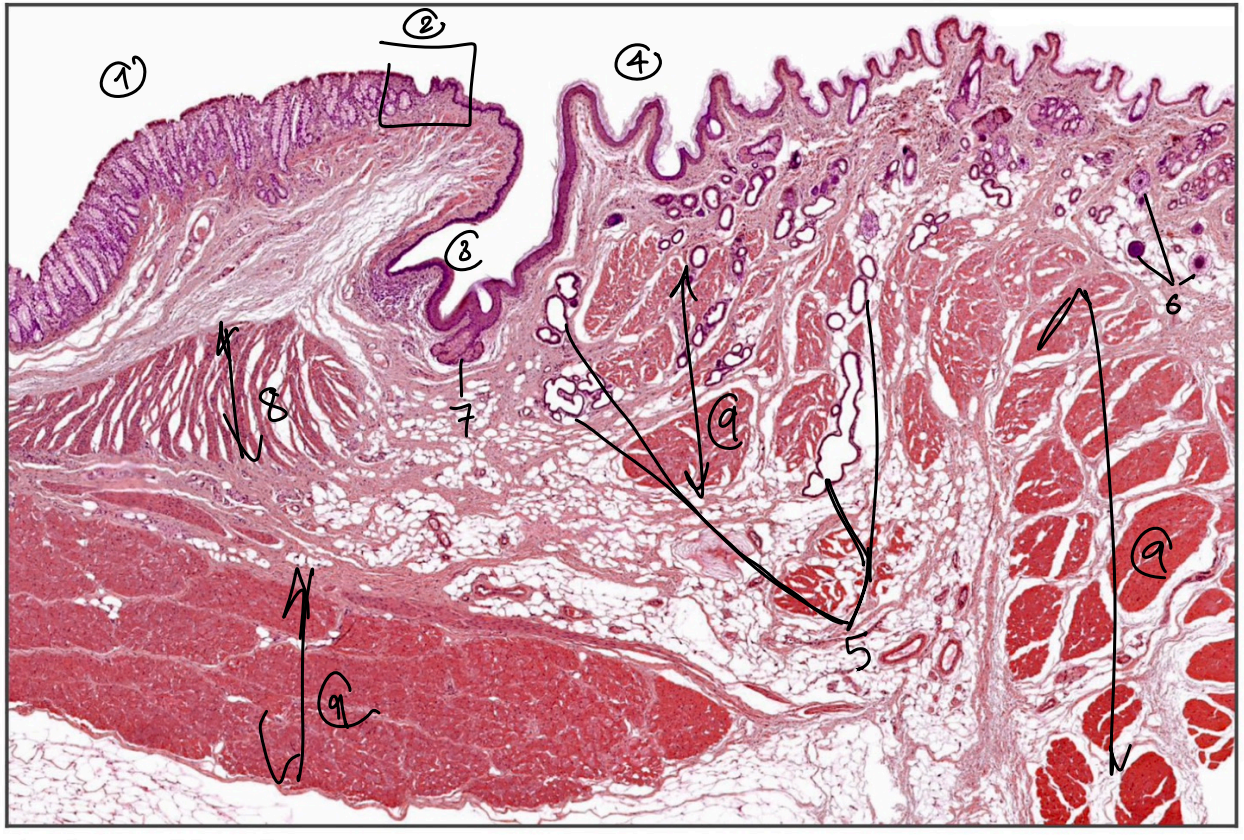


Muscularis externa

Most of the small intestine protrudes into an internal body cavity, the peritoneal cavity, and is therefore, covered by a serosa, consisting of a simple squamous epithelium (mesothelium) and a small amount of connective tissue. This serosa, called visceral peritoneum, produces a lubricating fluid that reduces friction between the organs. A portion of the duodenum is retroperitoneal, covered only on its anterior surface by a serosa. The posterior surface, where it contacts the posterior body wall, has an adventitia only. 800x

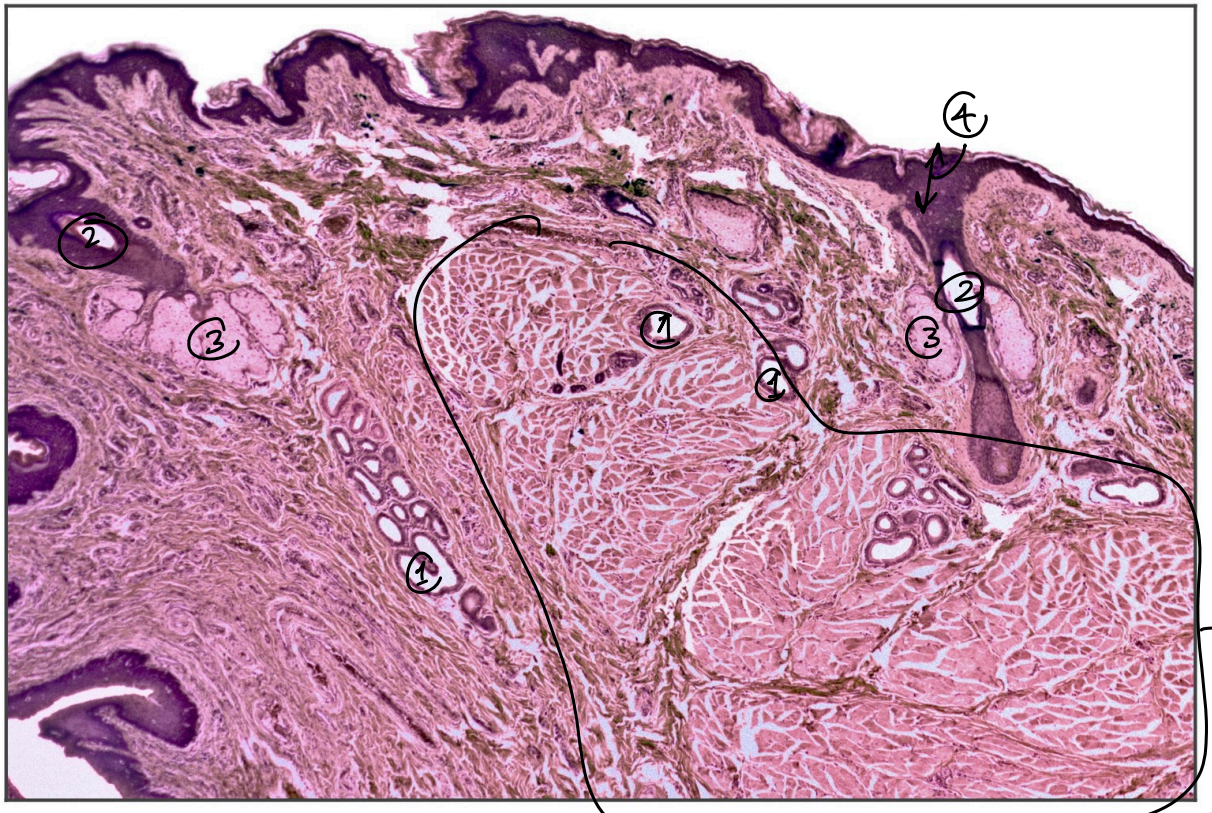
	Main Slide
1	Serosa
2	- Mesothelium
3	- Connective tissue
4	Blood vessels
	Muscularis externa

* Mesothelium ONLY lines serosa & NOT adventetia



Recto-anal junction

Main Slide	
1	Rectum
2	Recto-anal junction
3	Anal canal
4	Anus
5	Apocrine sweat glands
6	Hair follicles
7	Sebaceous glands
8	Internal anal sphincter >
9	External anal sphincter >
	Next image >
	Image source >



Anus

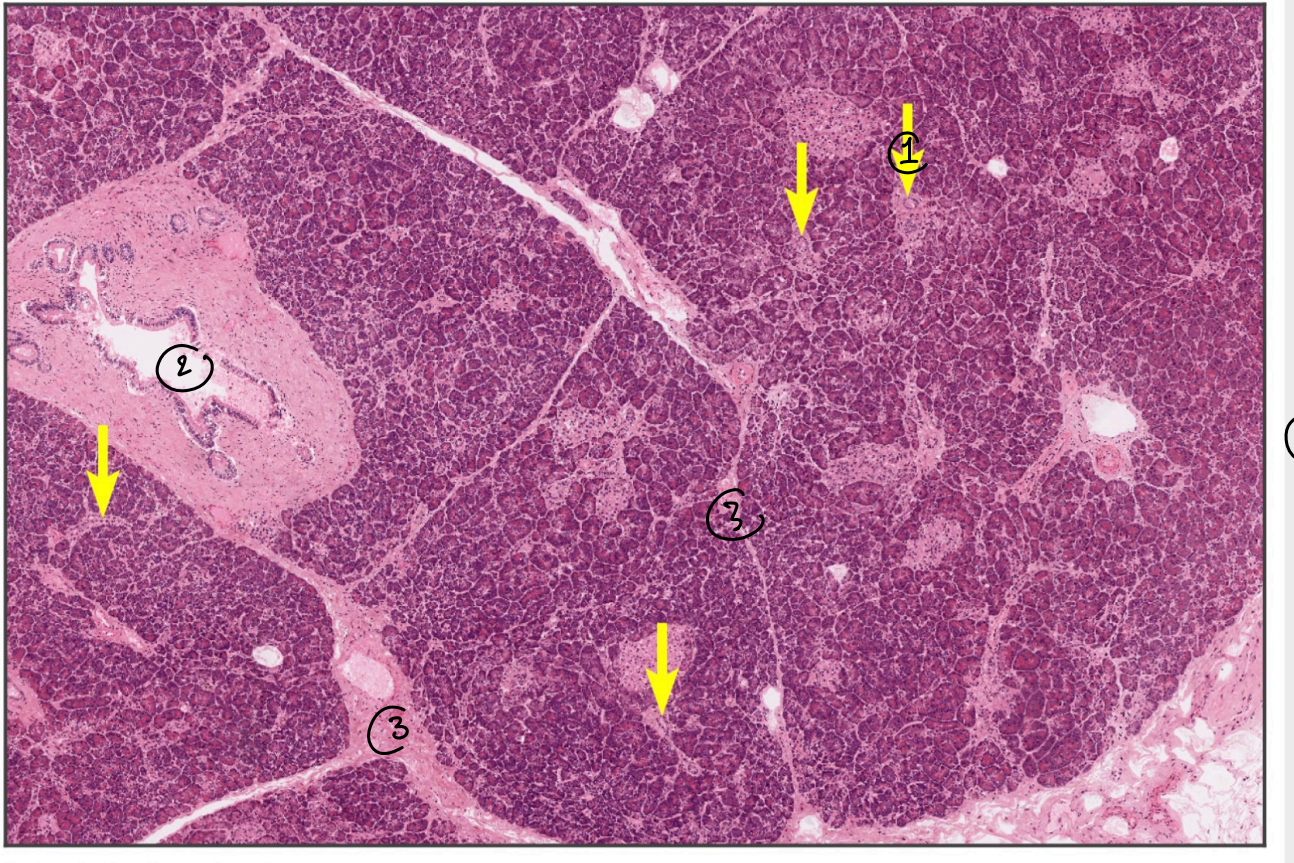
The anus is lined by a stratified squamous, keratinized epithelium and possesses apocrine sweat glands, eccrine sweat glands, sebaceous glands and hair follicles. Both apocrine sweat glands and sebaceous glands release their products into a hair follicle. Apocrine sweat glands are characterized by their large size and wide lumens and, like eccrine sweat glands, are classified as simple coiled tubular glands. 100x

Main Slide	
1	Apocrine sweat glands
2	Hair follicles
3	Sebaceous glands
4	Stratified squamous keratinized epithelium
5	External anal sphincter >

5
(since skeletal)

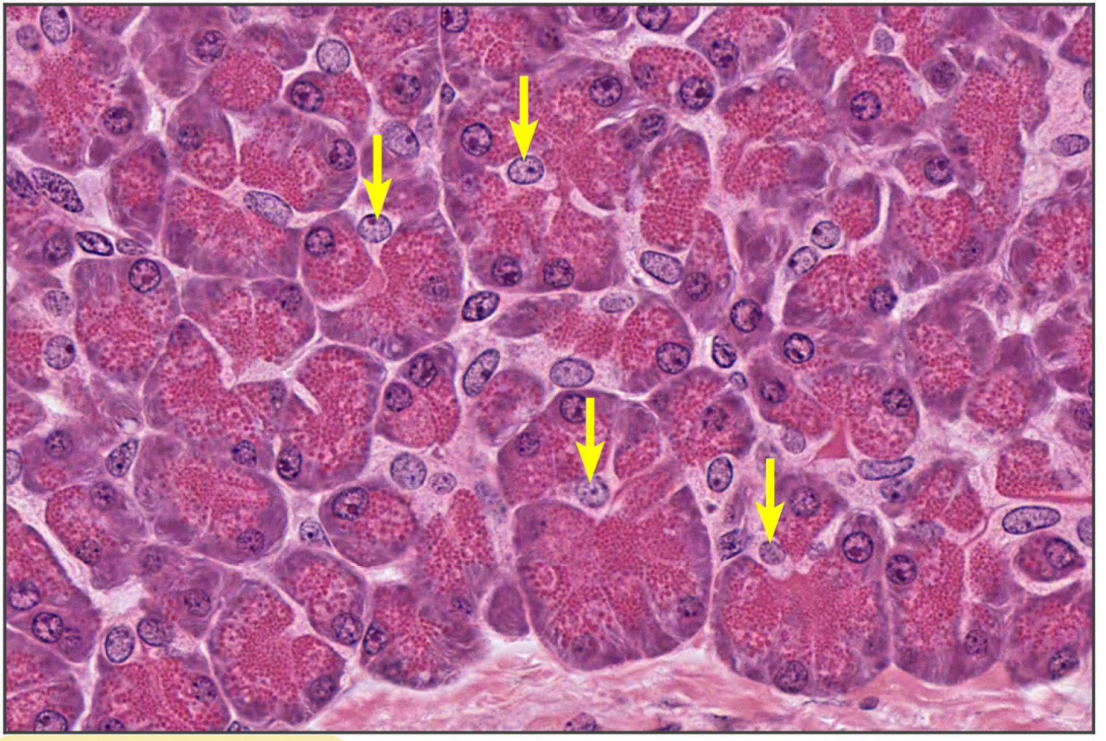
Internal anal sphincter: Smooth

External: Skeletal



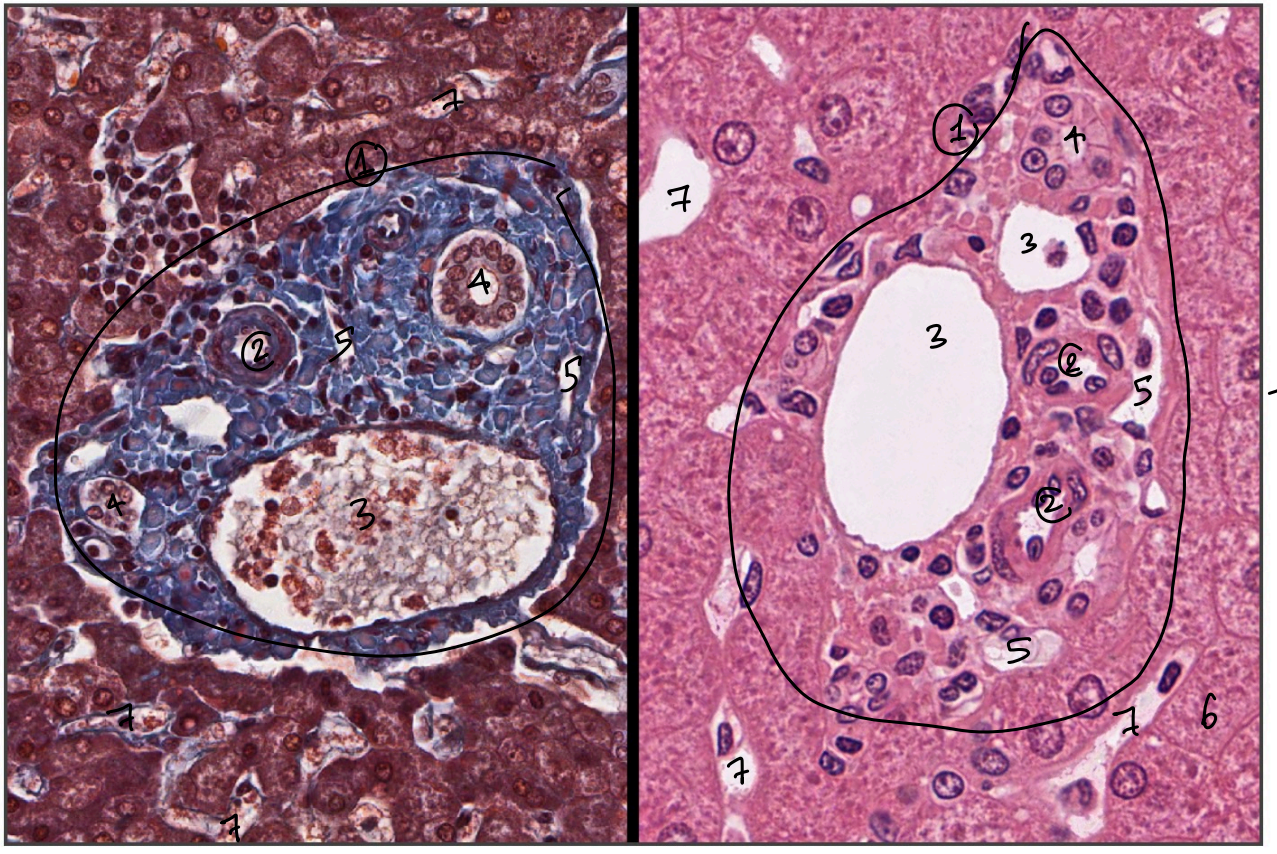
Intralobular duct

The exocrine pancreas, a compound acinar gland, comprises most of the pancreas. The pancreas has fewer intralobular and interlobular ducts than would be expected for a gland of its size and composition.



- Centroacinar cells >

A unique feature of the exocrine pancreas is that the smallest duct (intralobular duct) begins with centroacinar cells located within the center of the acinus. Intercalated ducts transport bicarbonate and water into their lumens.



Liver: portal canals

Portal canals, located in the interlobular connective tissue surrounding classic lobules, contain the portal triad (branches of the hepatic portal vein, hepatic artery and bile duct) and lymphatic vessels. The left image (pig liver) has been stained with a trichrome stain to differentiate connective tissue from liver parenchyma. 800x, 800x

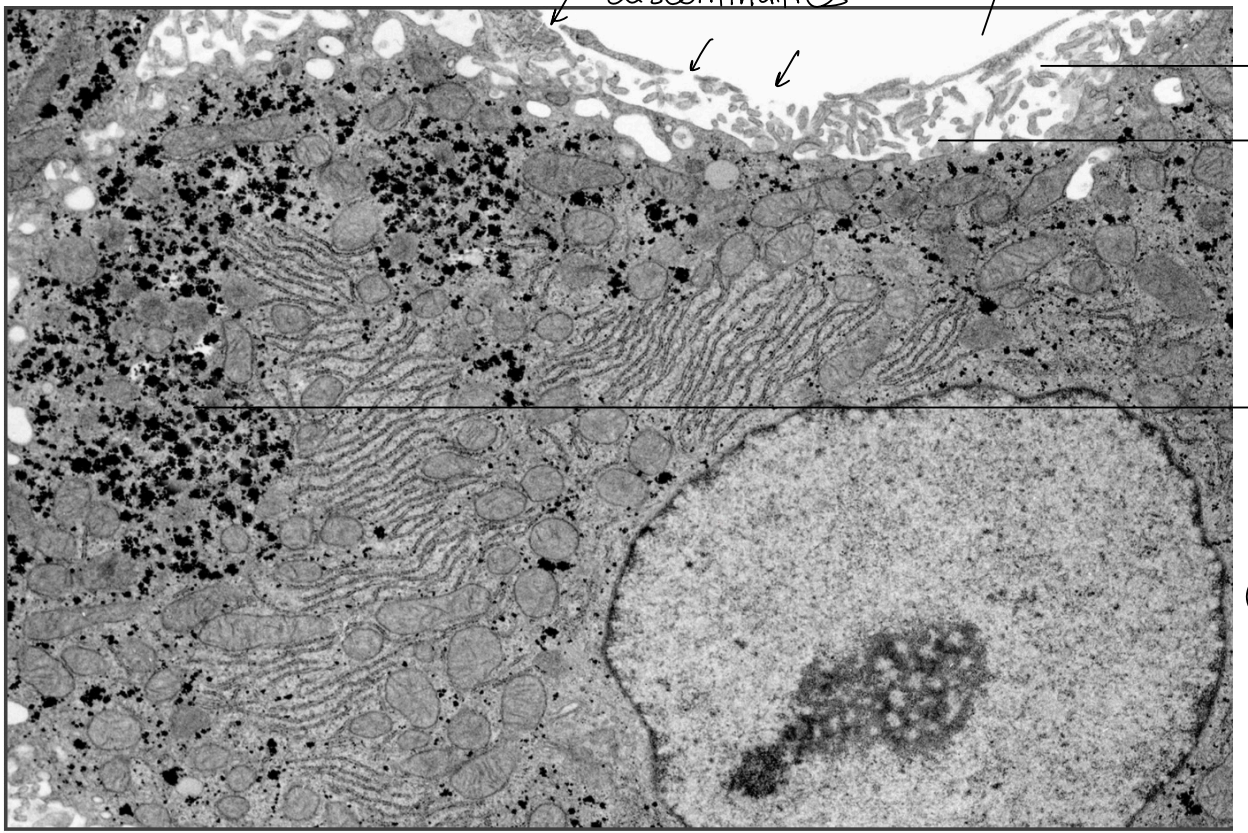
Main Slide	
1	Portal canals
2	Hepatic arteries >
3	Hepatic portal veins
4	Bile ducts >
5	Lymphatic vessels >
6	Hepatocytes >
7	Liver sinusoids >

Bile duct:

Simple cuboidal

B.V.:

Simple squam. (A thicker than V)



Liver: hepatocyte

(In liver, granules are glycogen whereas in pancreas: Secretory granules)