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**SMALL INTESTINE AND LARGE INTESTINE.**

**The small intestine is the longest section of the digestive tube and consists of three segments forming a passage from the pylorus to the large intestine.**

**THE THREE SEGMENTS ARE AS FOLLOWS: DUODENUM, JEJUNUM AND ILEUM.**

**DUODENUM:** A short section that receives secretions from the pancreas and liver via the pancreatic and common bile ducts.

**JEJUNUM:** Considered to be roughly 40% of the small gut in man, but closer to 90% in animals.

**ILEUM:** Empties into the large intestine, considered to be about 60% of the intestine in man, but veterinary anatomists usually refer to it as being only the short terminal section of the small intestine.

In most animal, the length of the small intestine is roughly 3.5 times body length- your small intestine or that of a dog is about 6meters in length. Although precise boundaries between these three segments of bowel i.e not observed grossly or microscopically, there are histologic differences among duodenum, jejunum and ileum.

A bulk of the small intestine is suspended from the body wall by an extension of the peritoneum called the MESENTERY. It is within the small intestine that the final stages of enzymatic digestion occur, liberating small molecules capable of being fully absorbed. The small intestine is also the sole sight in the digestive tube for absorption of amino acids and monosaccharides. All of these absorption and much of the enzymatic digestion takes place on the surface of the small intestinal epithelial cells, and to accommodate these processes a huge mucosal surface area is required.

**MUCOSAL FOLDS:** The inner surface of the small intestine is not flat, but thrown into circular folds, which not only increase surface area but aids in mixing the ingesta by acting as baffles.

**VILLI:** Within the circular folds are small hair like vascularised projections called VILLI that gives the mucosa a furry texture. There are about 20 to 40 villi per square millimetre, increasing the surface area of the epithelium tremendously. The mucosa epithelium primarily compose of absorptive cells, covers the villi.

**MICROVILLI:** As their name suggests microvilli are much smaller than villi. Although their small size makes it difficult to see each microvillus, their combines microscopic appearance suggests a mass of bristles, which is termed the BRUSH BORDER. Fixed to the surface of the microvilli membranes are enzymes that finish digesting carbohydrate and protein. There are estimated 200 million per square millimetre of a small intestine greatly expanding the surface area of the plasma membrane and thus greatly enhancing absorption.

**INTESTINAL GLANDS:** In addition to the three specialised absorptive features just discussed, the mucosa between the villi is dotted with deep crevices that each lead into a tubular gland (CRIPT OF LIEBERKUHN) is formed by the lines in the crevices. These produces intestinal juice, a slightly alkaline (PH 7.4 to 7.8) mixture of water and mucus. The sub mucosa of the duodenum is the only site of the complex mucus-secreting duodenal glands (BRUNNER'S GLANDS). Which produce bicarbonate alkaline mucus that buffers the acidic chime as it enters from the stomach.

The mucosa of the small intestine is lined by a simple columnar epithelium which consists primarily of absorptive cells (ENTEROCYTES), with scattered goblet cells and occasional Enterendocrine cells.

**THE ROLES OF THE CELLS OF THE SMALL INTESTINE**

<b>GOBLET CELLS</b>	<b>Epithelial intestinal glands</b>	<b>Secretion of mucus</b>		
<b>PANETH CELLS</b>	<b>Intestinal glands</b>	<b>Secretion of bactericidal enzyme lysosome; phagocytosis</b>		
<b>G CELLS</b>	<b>Intestinal glands of duodenum</b>	<b>Secretion of hormone intestinal gastrin</b>		
<b>I CELLS</b>	<b>Intestinal glands of duodenum</b>	<b>Secretion of the hormone cholestykinin, which stimulates the release of pancreatic juice</b>		
<b>K CELLS</b>	<b>Intestinal glands</b>	<b>Secretion of hormone glucose-dependent insuloninotropic peptide, which stimulates the release of insulin.</b>		
<b>M CELLS</b>	<b>Intestinal glands of duodenum and jejunum</b>	<b>Secretion of the hormone motilin, which accelerates gastric emptying, stimulates intestinal peristalsis, stimulates the production of pepsin</b>		
<b>S CELLS</b>	<b>Intestinal glands</b>	<b>Secretion of hormone secretin</b>		

**LARGE INTESTINE.**

The large intestinal is the terminal part of the alimentary canal. The primary function of this organ is to finish absorption of nutrients and water, synthesize certain vitamins, form feces, and eliminate feces. The large intestine is that part of the digestive tube between the terminal ileum and anus. Depending on the species, ingesta from the small intestine enters the large intestine through either the ileocecal or ileocolic valve. The large intestine is lined with simple columnar epithelium. Both the small and the large intestine have goblet cells, but they are abundant in the large intestine.

The large intestine has the same 4 layers found in the most parts of the GI tract. They are as follows;

**MUCOSA:** Includes a columnar epithelium with large number of mucus- secreting goblet cells (VILLI; present in small intestine; absent in colon), lamina propria, and muscularis mucosa; the appendix is rich in mucosa- associated lymphoid tissue (MALT)**SUBMUCOSA:** Contains the blood vessels and Meissner nerve plexus.

**MUSCULARIS PROPRIA:** Contains continuous inner circular and outer longitudinal muscles arranged in bands and myenteric(AUERBACH) nerve plexus; tenia coli are formed by bands of the outer longitudinal muscles.

**SEROSA:** Visceral peritoneum.

#### **SEGMENTS OF LARGE INTESTINE.**

The large intestine formed of the following organs:

The cecum: is a blind-ended pouch that in humans carries a worm-like extension called APPENDIX.

The colon: constitutes the majority of the length of the large intestine and is subclassified into ascending, transverse and descending segments.

The rectum: is the short, terminal segment of the digestive tube, continuous with the anal canal.

The anal canal: It is the lower part of the large intestine.

It is functioned to give passage for the feces outside the body.

#### **THE FUNCTION OF THE LARGE INTESTINE.**

The absorption of water and recovery of electrolytes.

The formation and storage of faeces and fermentation of some of the indigestible food matter by bacteria.