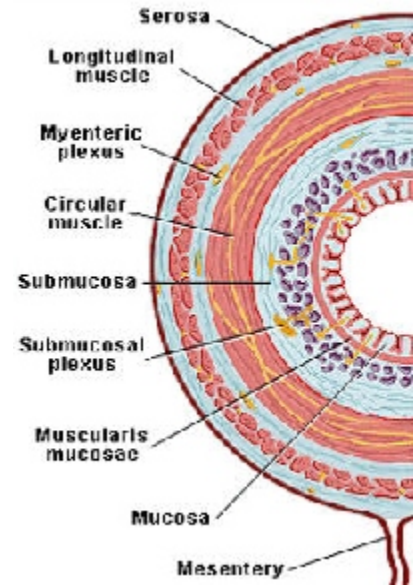


# INTESTINES

4/8/82, rvsd 20 April 1995, 24 April 1997, 23 April 98, 27 April 00, 24 April 02, 28 Apr 03, 27Apr09  
Martini 4<sup>th</sup>: pp884-890, 5<sup>th</sup>: 847-887, 7<sup>th</sup>: , 8<sup>th</sup>: 898

## FOUR layers of generalized GI tract (p 881)

- serosa** serous membrane, [if lacking serosa, adventitia present]
- muscularis externa** circular and longitudinal muscle, myenteric plexus controls peristalsis (stimulated by parasympathetic, inhibited by sympathetic)
- submucosa** large blood vessels, lymphatics, some exocrine glands
- mucosa** mucous membrane, lamina propria, simple columnar epithelium (can contain mucous glands (duodenum only))
- mesenteries** sandwich of peritoneum. folds of mesentery: lesser and greater omentum



## SMALL INTESTINE: 3-5 m long. (p 898)

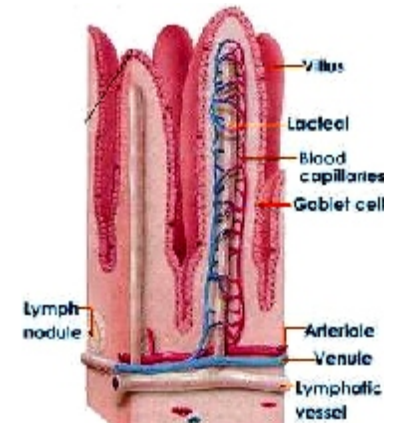
900 **lacteal** lymphatic vessels drain lymph from villi, contain **chylomicrons** (juice, little, unit).  
**microvilli** (brush border) line, yield surface area of tennis court for small intestine.

**Duodenum:** (2 + 10) curves around head of pancreas, site of neutralization of acid, mix in digestive enz

902 **Brunner's glands:** submucosal mucous glands, rich in  $\text{HCO}_3^-$ , diagnostic of duodenum.  
**ampulla of Vater** (combined bile and pancreatic ducts) empties through the **duodenal papilla**, controlled: sphincter of Oddi, retroperitoneal

**Jejunum:** (empty) suspended by mesentery, 1.5 m long, digestion and absorption occur

**Ileum** (means twisted) last 2 m, primarily absorption  
**ileocecal valve**, flap  
**plicae circulares:** [folds, circular shelf-like folds carrying intestinal villi]  
**Peyer's Patches:** lymphatic tissue embedded in wall, diagnostic of ileum



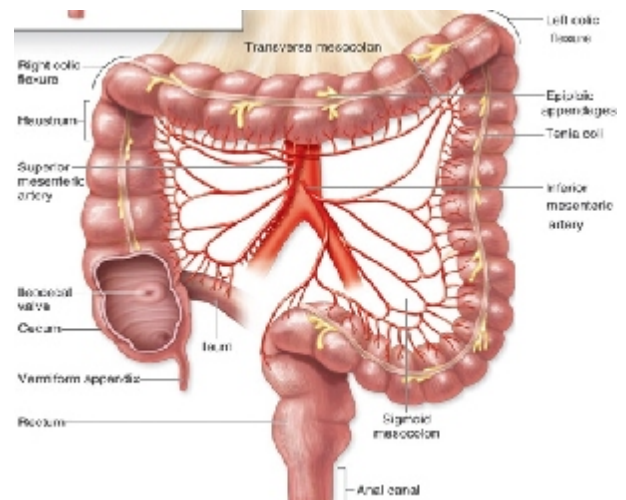
## PHYSIOLOGY OF DIGESTION: page 910:

| food stuff   | first site | agents              | products               | absorbed form  |
|--------------|------------|---------------------|------------------------|----------------|
| carbohydrate | mouth      | amylase             | maltose                | monosaccharide |
| protein      | stomach    | pepsin & HCl        | peptides               | amino acids    |
| fats         | duodenum   | lipase & bile salts | fatty acids & glycerol | FA & glycerol  |

## COLON: (p 912) functions to resorb water.

Entrance through ileocecal valve (no villi or plica circulares)  
**taenia coli** (ribbon) longitudinal smooth muscle is in *three strips*  
**haustra** (draw up) tania draw up wall to form pockets

**PORTIONS:** **cecum** blind end, **vermiform appendix** attached  
**ascending colon** **hepatic flexure** (gas pains here and in splenic flexure)  
**transverse colon** **splenic flexure**  
**descending colon**  
**sigmoid colon**  
**rectum** lined with stratified squamous  
**anus** double sphincters, inside smooth, outside skeletal muscle



“Need to go?” Inner sphincter dilates. Can recontract, urge subsides  
gastrocolic reflex: stomach full, inner sphincter dilates. Sympathetic NS: open sphincters.

## Hormonal regulation: (p. 896)

|                 |                              |              |   |
|-----------------|------------------------------|--------------|---|
| gastrin         | distention of stomach, vagus | stomach wall | release gastric secretions  |
| secretin        | acid in duodenum             | duodenum     | release pancreatic chyme  |
| cholecystokinin | fatty acids in duodenum      | duodenum     | 1) slow peristalsis<br>2) contract gall bladder<br>3) suppress appetite |

