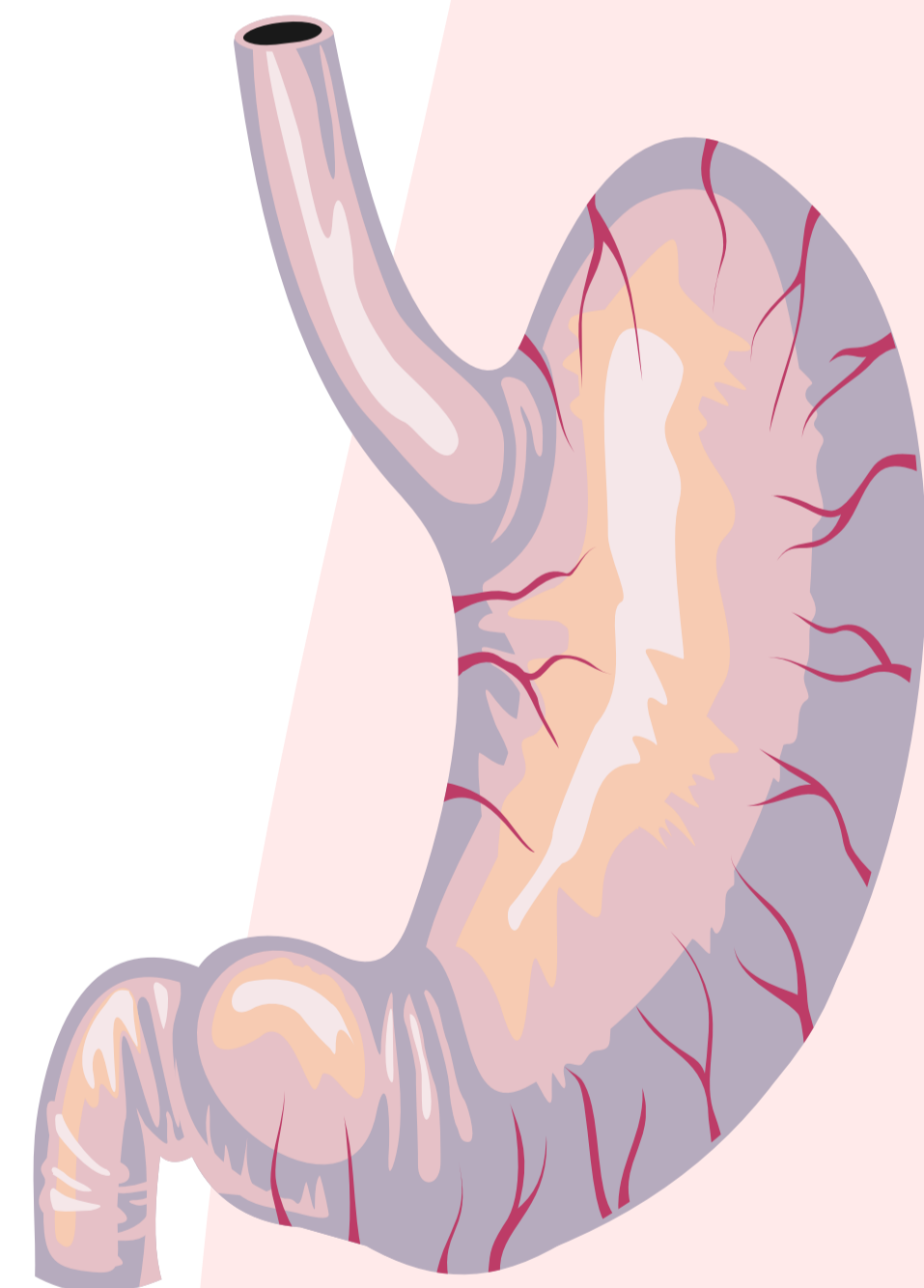
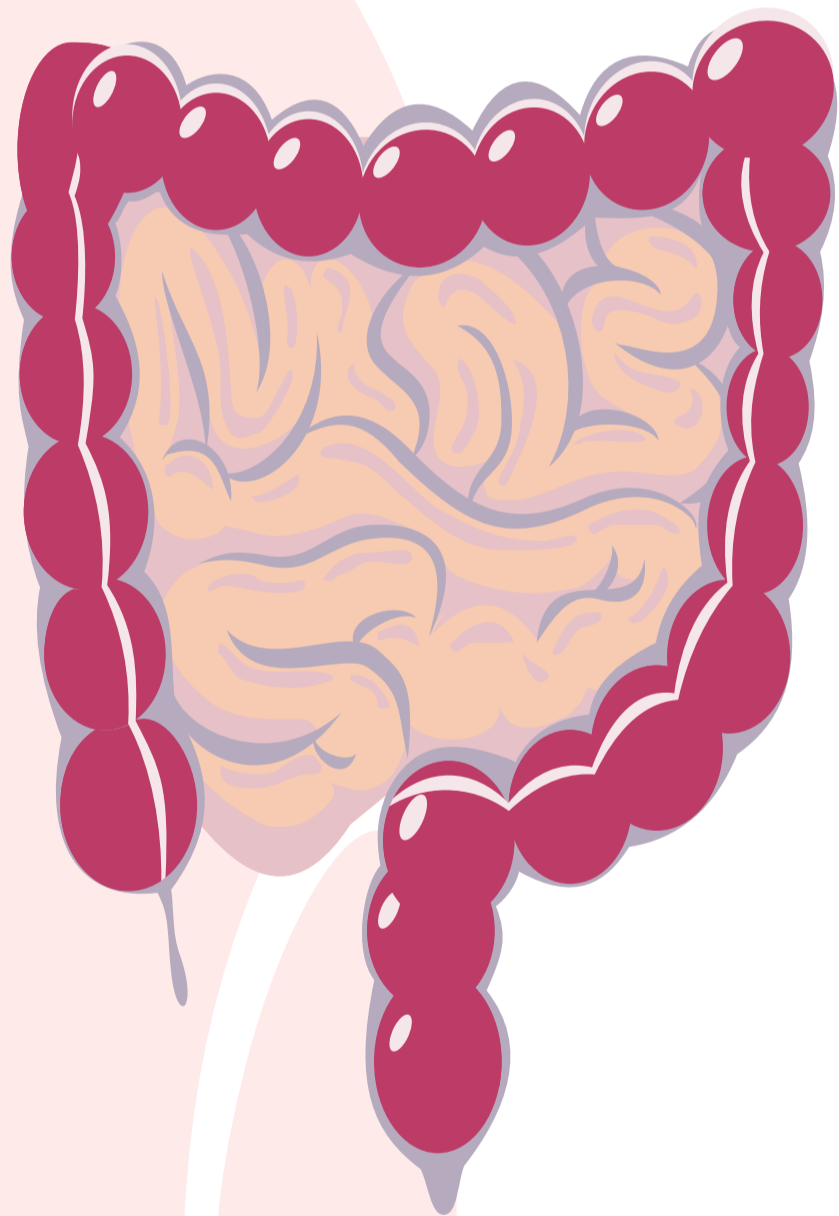


# Large Intestine



Color index:

- Main text
- important
- female slides
- male slides
- Dr.note
- Extra

**Editing File**

[ Gastrointestinal & Nutrition Block | Histology ]

# Objectives



**At the end of this lecture, you should be able to answer the following (objectives):**

- Identify the histological structure of the 4 layers of colon.
- Identify the histological structure of the 4 layers of appendix.

## Table of contents:

**Large intestine**

**Colon**

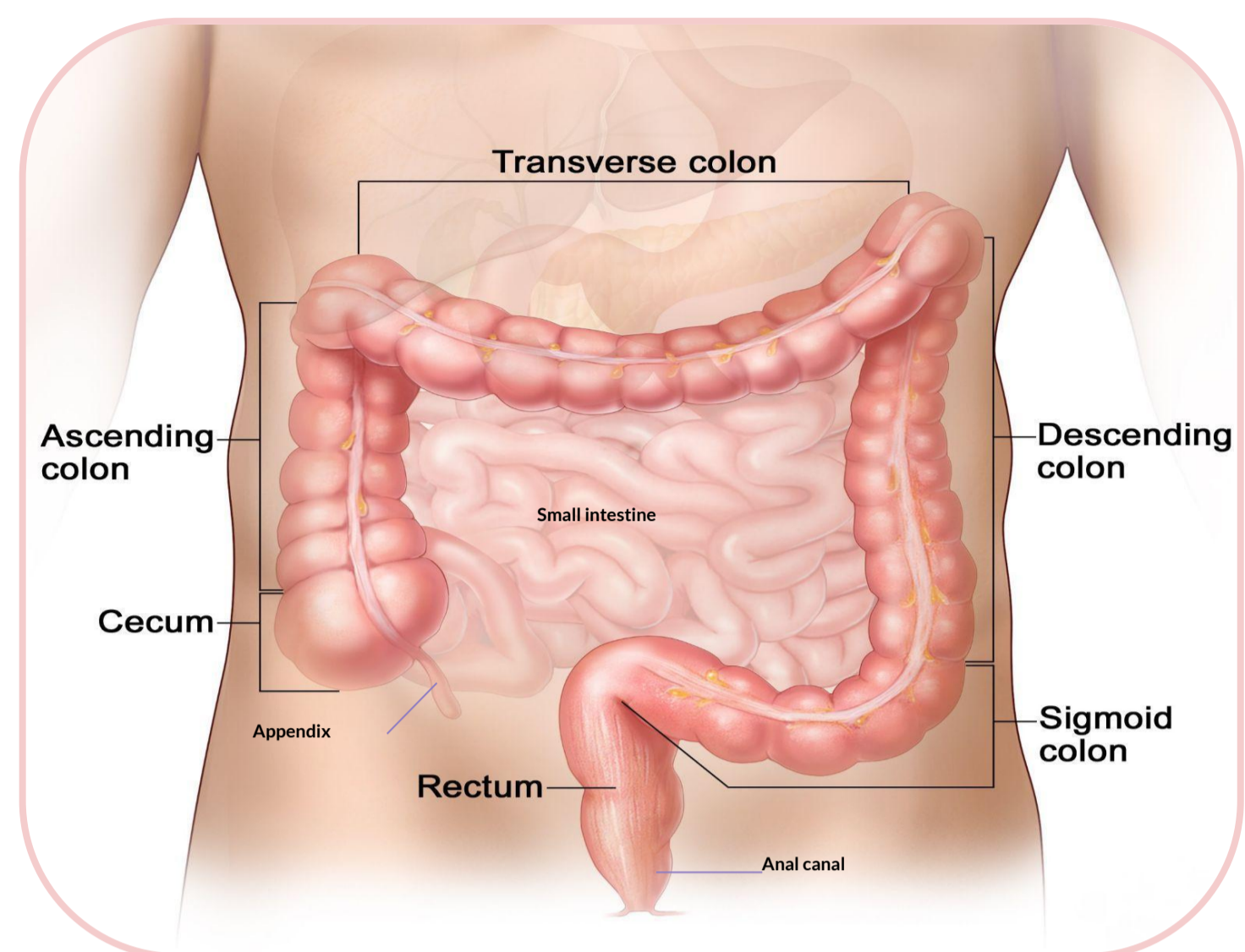
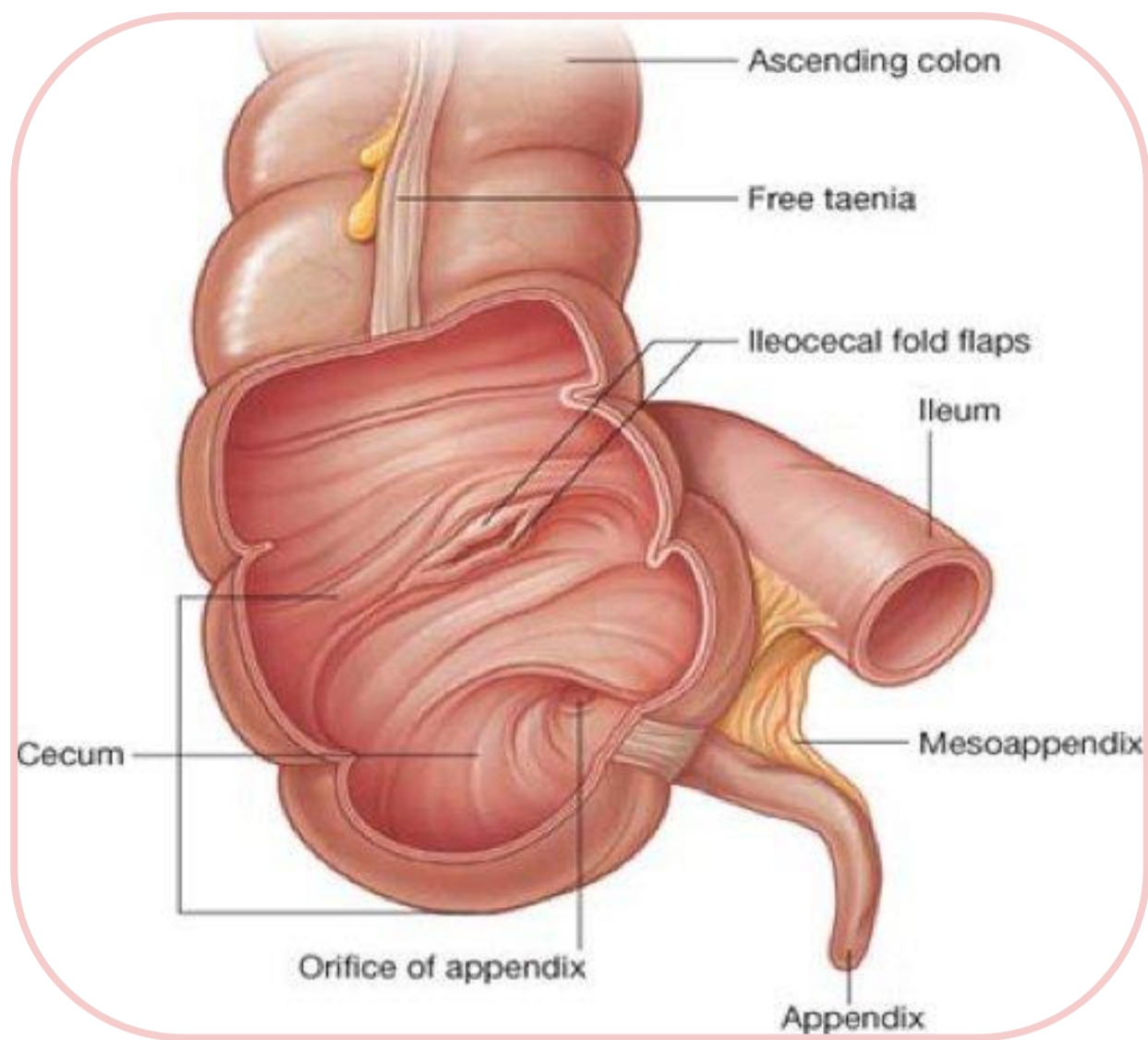
**Crypts of colon lining**

**Vermiform appendix**

This lecture was presented by:  
**Prof. Aly Mohamed**      **Prof. Raesa Abdultawab**

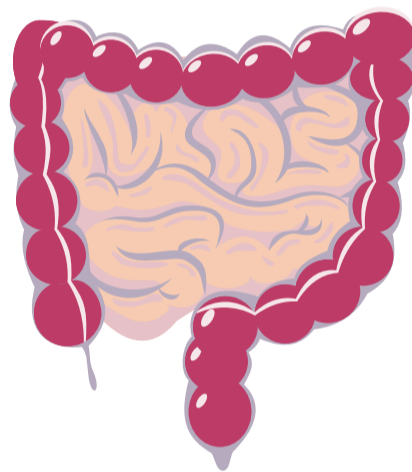
# Large intestine

- Separated from the small intestine by ileocecal valve



## Functions of Large intestine

1. Eliminate Waste
2. Reabsorb  $H_2O$  & Ions<sup>+/-</sup>
3. Colonized by Normal Flora



## Anatomically is divided into:

1. Appendix
2. Cecum
3. Colon (ascending, transverse, descending & sigmoid)
4. Rectum
5. Anal canal

# Colon

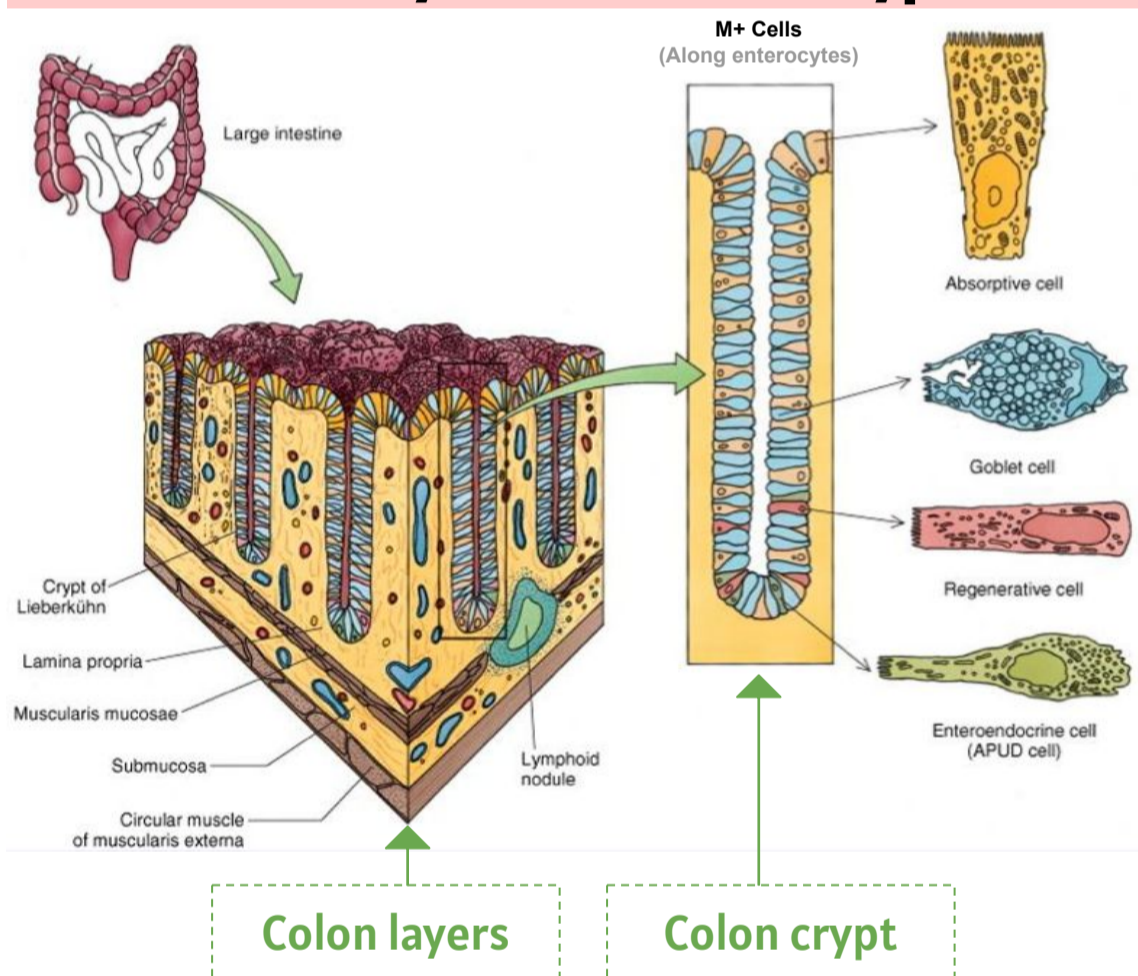
Feature	Description	Pictures
Mucosa Only crypts <b>NO villi</b>	<ul style="list-style-type: none"> <li>● <b>Epithelium:</b> Simple columnar epithelium with <b>numerous goblet cells</b>. Goblet cells ↑ as we go down the colon for lubrication.</li> <li>● <b>Lamina propria:</b> C.T containing                             <ul style="list-style-type: none"> <li>○ Numerous crypts (Crypts cells same as small intestine but <b>NO Paneth cells</b>) (Colon is rich in normal flora 'Bacteria' and Paneth cells are anti-bacterial cells so Colon cannot contain them)</li> <li>○ Lymphatic nodules: Frequent (solitary متناثرة) (to combat <i>harmful</i> bacteria; not arranged as Peyer's patches &amp; usually do not reach the submucosa).</li> </ul> </li> <li>● <b>Muscularis mucosae:</b> 2 layers of smooth muscle cells.</li> </ul>	<p>Goblet cells here are prominent (light pink mucosa), suggesting that this section could be from the <i>descending</i> colon.</p> <p>Lymphatic Nodules (Solitary)</p> <p>Appendices Epiploicae</p>
Submucosa	<ul style="list-style-type: none"> <li>● <b>NO glands</b> (submucosal glands are only found in duodenum &amp; esophagus).</li> <li>● <b>Meissner's nerve plexus</b></li> </ul>	
Muscularis Externa	<ul style="list-style-type: none"> <li>● <b>Smooth muscle layers:</b> <ul style="list-style-type: none"> <li>○ Inner circular: <b>Continuous with the layer</b></li> <li>○ Outer longitudinal: <b>Not continuous (interrupted)</b> but in the form of longitudinal 3 ribbons/bands (<b>teniae coli</b>) كأنها 3 خصل من الشعر، كل خصلة بجهة</li> </ul> </li> <li>● <b>Auerbach's nerve plexus</b></li> </ul>	<p>A section showing the myenteric plexus in between the 2 layers of smooth muscle. Note that the appendices epiploicae is not shown here.</p>
Serosa	<ul style="list-style-type: none"> <li>● C.T. covered by mesothelium</li> <li>● Fat-filled pouches (pendulous masses) called <b>Appendices epiploicae</b>. (Adipose tissue that lies in between the bands of teniae coli; bulges upon contraction.)</li> </ul>	

# Intestinal Crypts of Colon

## Cells lining the crypts are:

- 1 Surface columnar absorptive cells.
- 2 Goblet cells.
- 3 Enteroendocrine cells.
- 4 Stem cells.
- 5 M cells. (Allows passage of antigen from lumen to immune cells inside)

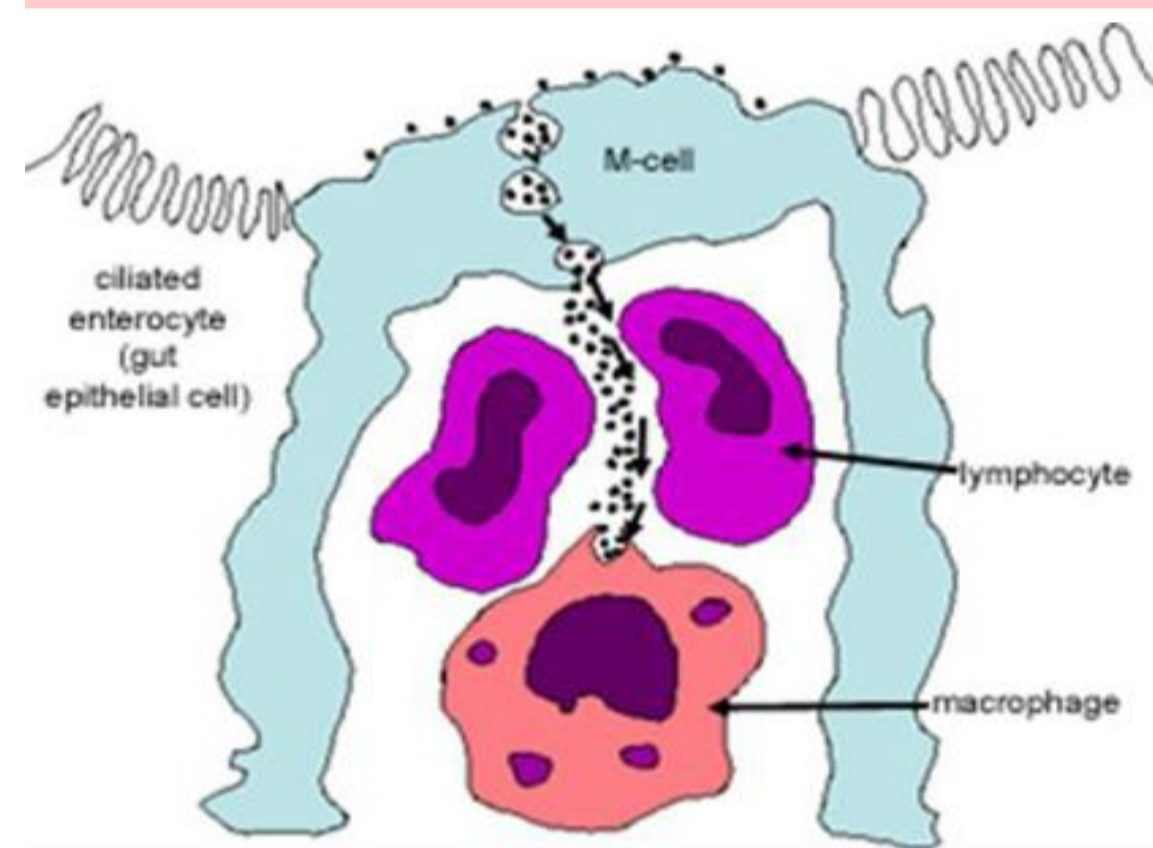
### Colon layers and colon crypt



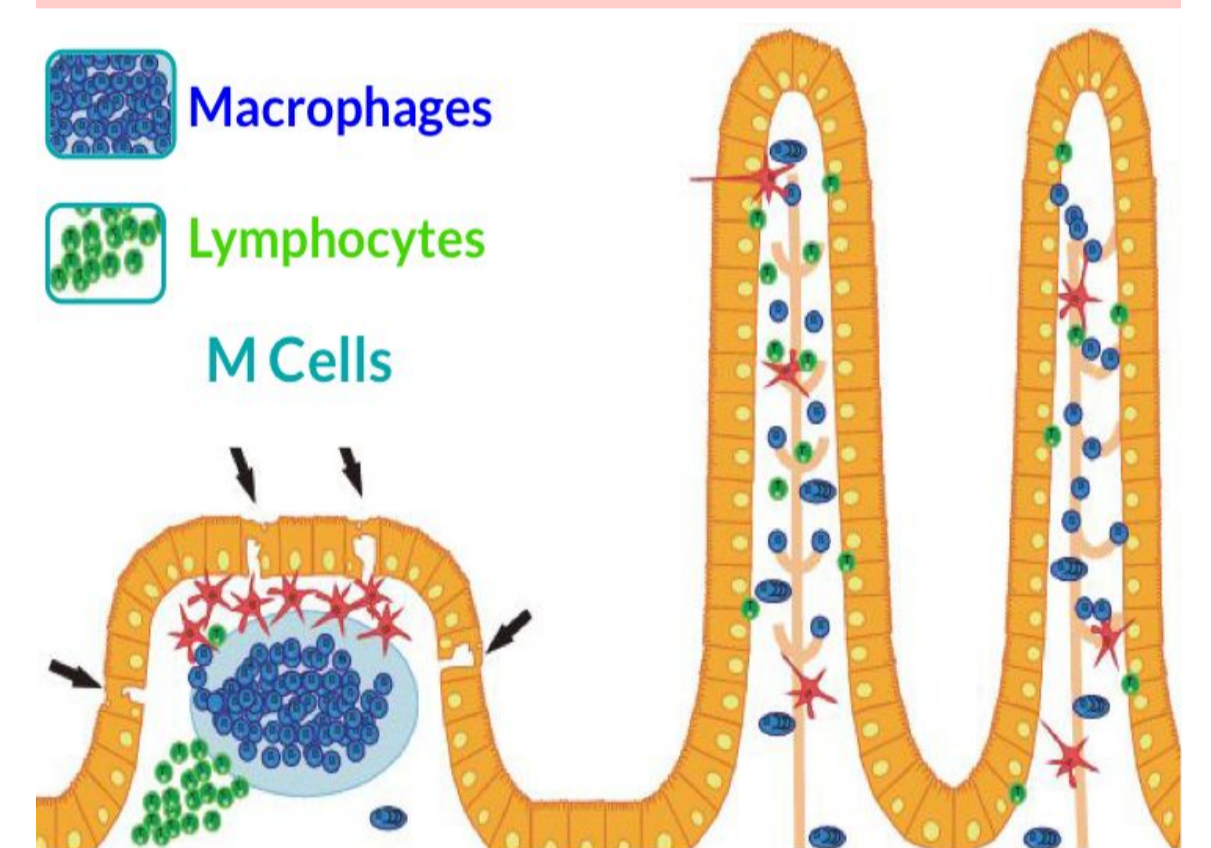
Colon layers

Colon crypt

### Colon mucosa (from slides)



### Colon mucosa (from team 442)



M Cells AKA Mo cells You won't be asked about M Cells in the exam (Histology Questions)

# Vermiform Appendix

Vermiform = Worm Like

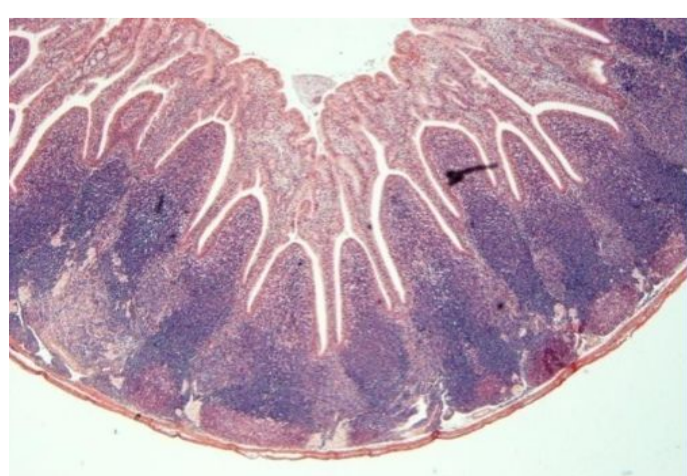
Features

- 1-Similar to the colon, but with much smaller diameter, shallow crypts, **more lymphoid nodules** (aggregated lymphoid nodules, all around, in lamina propria and extending into submucosa), Few goblet cells and more EE (DNES) cells.
- 2-Muscularis mucosae: Not continuous.
- 3-Muscularis externa: **No teniae coli**, It is invested by serosa.

### 4-Cells lining the crypts are:

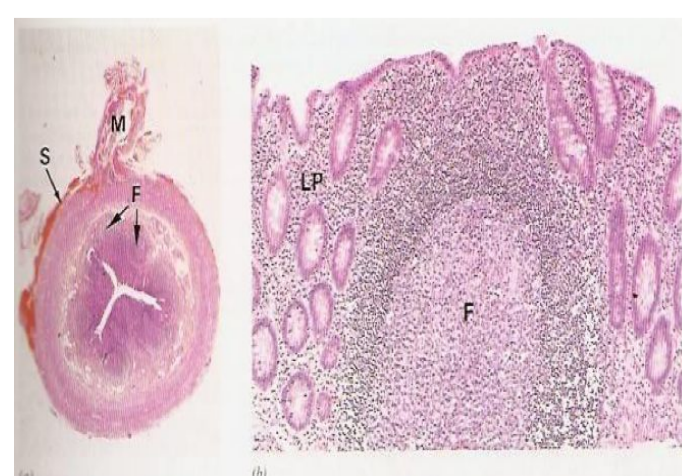
- 1-Surface columnar absorptive cells.
- 2-Goblet cells.
- 3-Enteroendocrine cells.
- 4-Stem cells.
- 5-M-cells.

Same as mentioned above



Crypts are compressed by lymphatic tissue. That's why they look like an inverted Y

Lumen is slit like space with no food (if there's food = The inflammation will remain)



Rabbit appendix

# MCQs

**01** Which of the following cells is found in the colon

A- Paneth cells	B- Goblet cells	C- Peptic cells	D- Parietal cells
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**02** Which of the following is right about the appendix ?

A- no M cells	B- no EE cells	C- no teniae coli	D- no muscularis mucosae
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**03** Which of the following cells not present in colon ?

A- stem cell	B- paneth cell	C- Goblet cell	D- Enteroendocrine cell
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**04** Which of the following content is found in appendix in large amounts ?

A- Goblet cells	B- Lymphatic nodules	C- paneth cell	D- Stem cell
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**05** Which of the following is wrong about the colon ?

A- no villi	B- no paneth cells	C- solitary lymphatic nodules	D- no M cells
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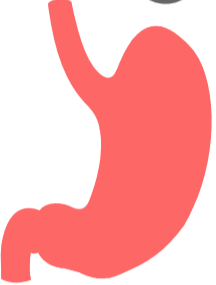

Answer key:

1. B
2. C
3. B
4. B
5. D

# This Lecture is done by:

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- Khalid AlRasheed
- Faisal Alzuhairy
-  **Abdullah Aldhuwaihy**
- Fahad Almughaiseeb
- Abdulrahman Alosleb
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## Reviewed by

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- **Academic leaders**