

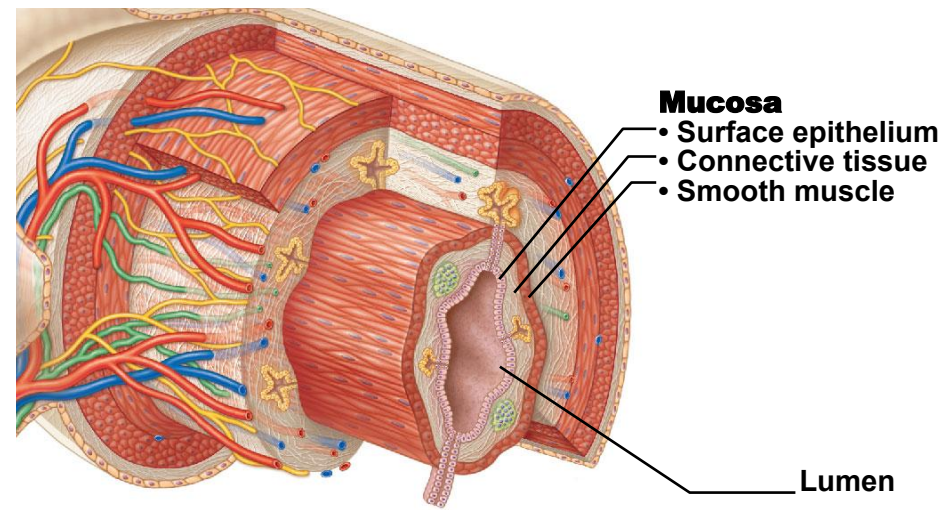
Microscopic Anatomy of Alimentary Canal Organs

- The walls of the alimentary canal organs from the esophagus to the large intestine are made up of the same four tissue layers:
 1. **Mucosa**
 2. **Submucosa**
 3. **Muscularis externa**
 4. **Serosa**

Microscopic Anatomy of Alimentary Canal Organs

1. Mucosa

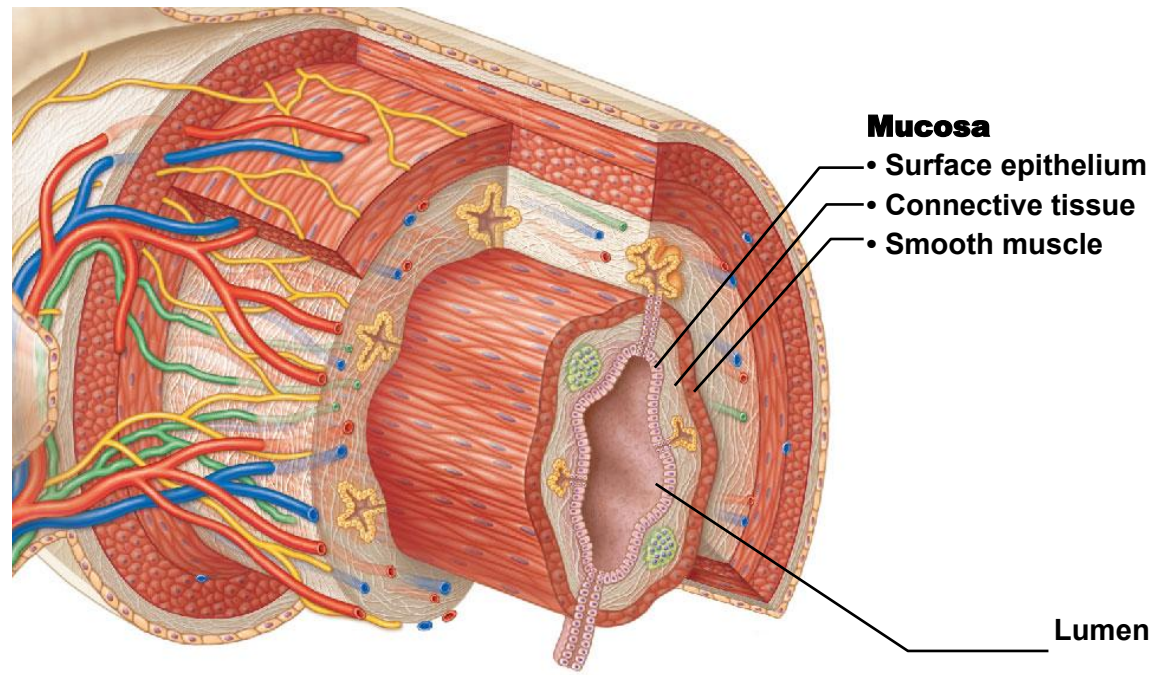
- **Innermost, moist** membrane consisting of:
 - **Surface epithelium** that is mostly **simple columnar epithelium**
 - ✓ Exception: The mucosa of the mouth, esophagus, and anus is **stratified squamous epithelium**
 - Small amount of **connective tissue**
 - Thin, **smooth muscle** layer



Microscopic Anatomy of Alimentary Canal Organs

1. Mucosa

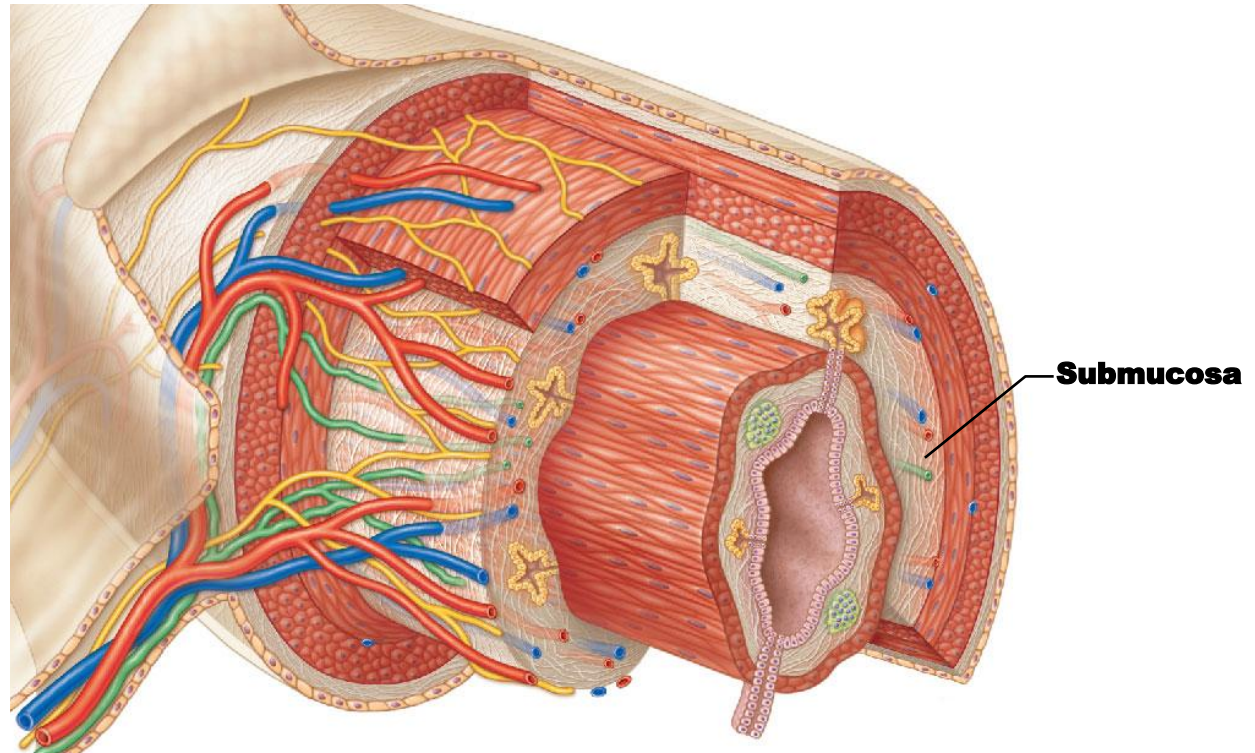
- Lines the **lumen** (cavity of the alimentary canal)
- Functions:
 - ✓ Protection
 - ✓ Secretion
 - ✓ Absorption



Microscopic Anatomy of Alimentary Canal Organs

2. Submucosa

- Just **beneath** the mucosa
- **Loose areolar connective tissue**
- Contains **blood vessels, nerves, and lymphatic vessels**

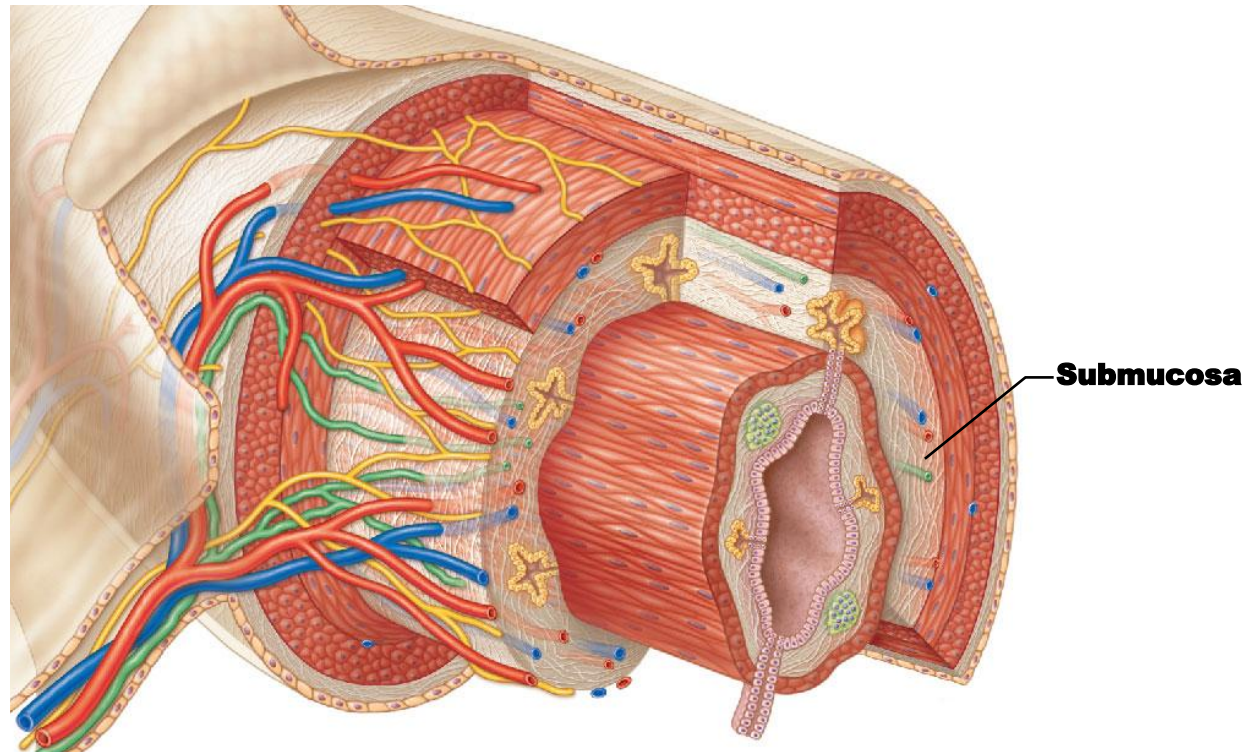


Microscopic Anatomy of Alimentary Canal Organs

2. Submucosa

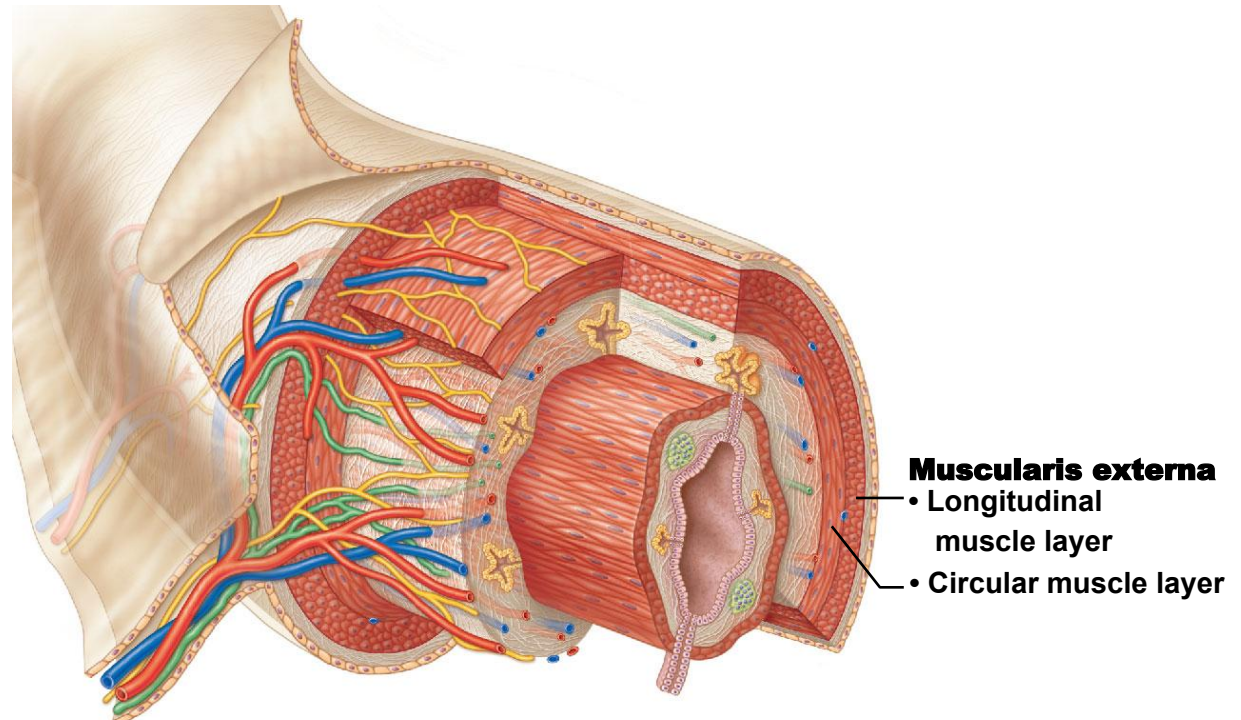
▪ Functions:

- ✓ Nourishes surrounding tissues
- ✓ Transports absorbed materials



Microscopic Anatomy of Alimentary Canal Organs

3. Muscularis externa
 - **Smooth muscle layer**
 - ✓ Inner **circular** layer
 - ✓ Outer **longitudinal** layer

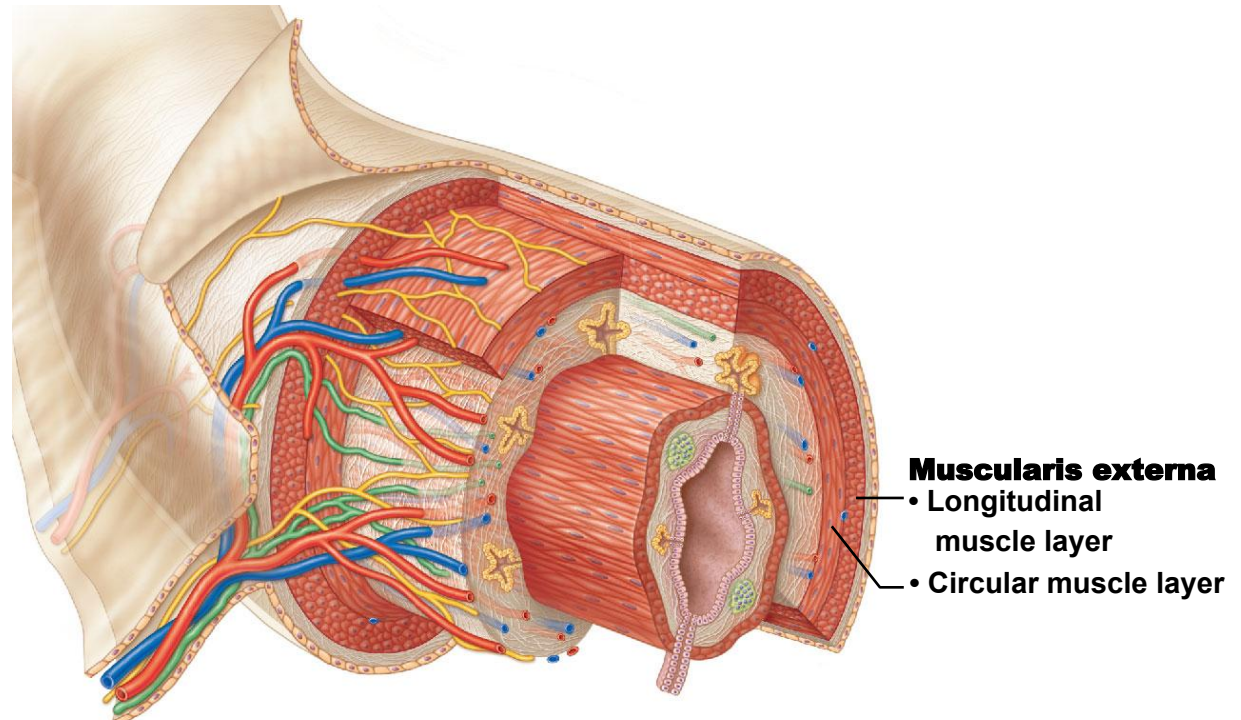


Microscopic Anatomy of Alimentary Canal Organs

3. Muscularis externa

- Function:

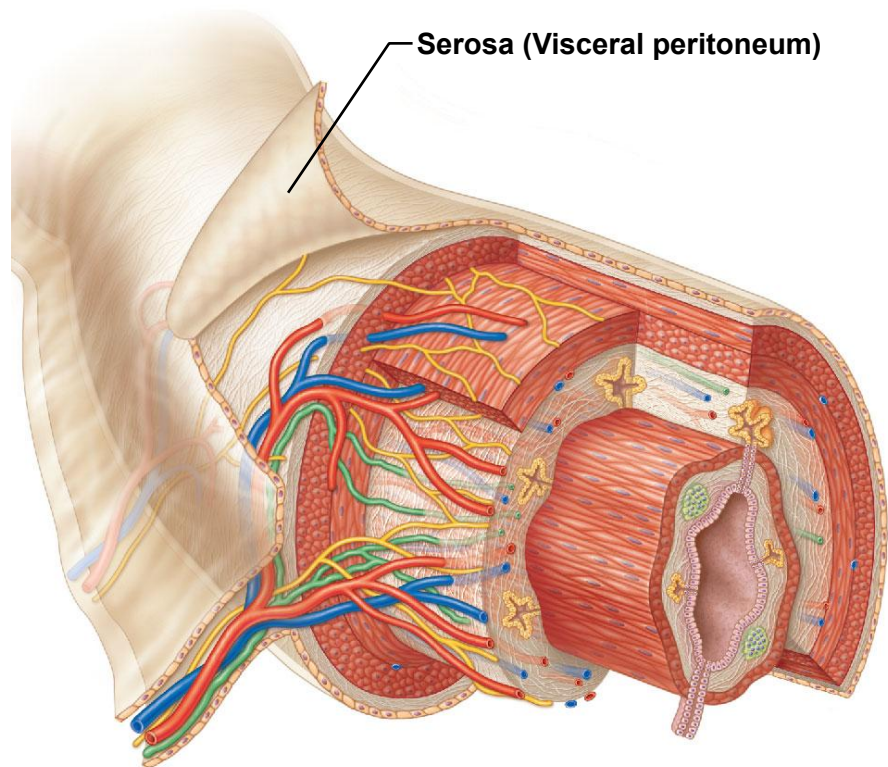
- ✓ **Movement of the tube and its contents**



Microscopic Anatomy of Alimentary Canal Organs

4. Serosa (Visceral peritoneum)

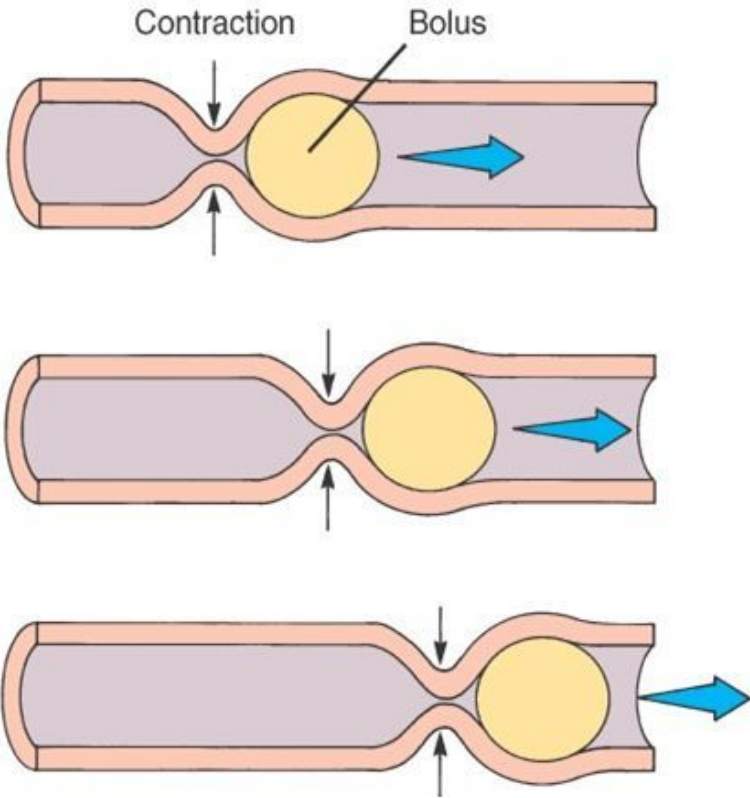
- **Outermost** layer of the wall
- **Epithelium** and **connective** tissue
- Contains **cells that secrete serous fluid**
- Functions:
 - ✓ **Protection**
 - ✓ **Lubrication**



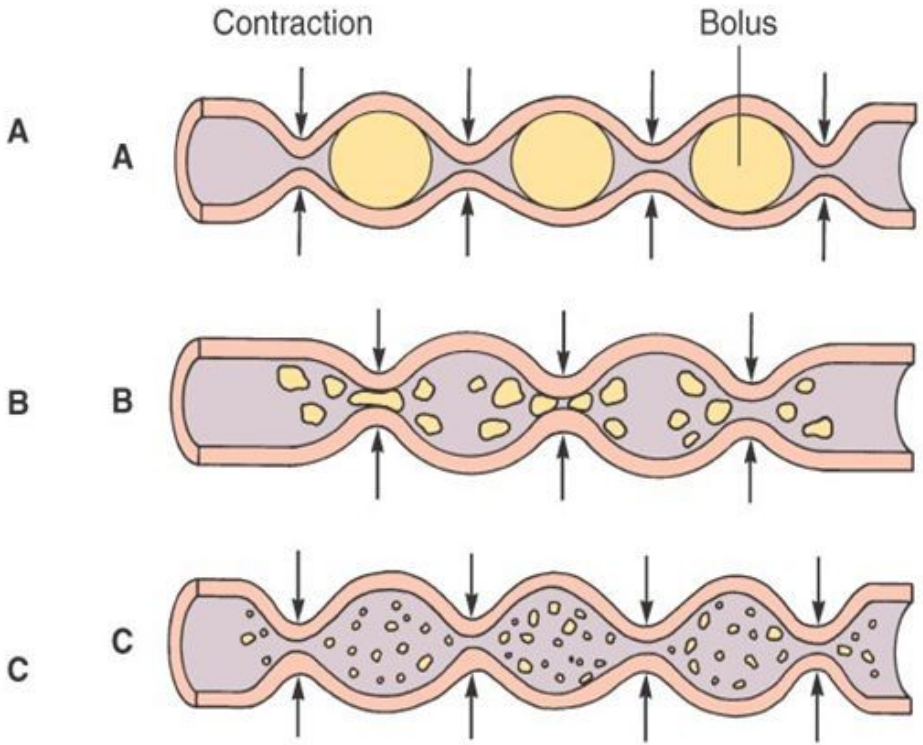
Digestive System Processes

- Essential processes of the alimentary canal:
 1. **Ingestion**
 - ✓ Placing of food into the mouth
 2. **Propulsion**
 - ✓ Movement of foods from one region of the digestive system to another
 - ✓ Two types of propulsion:
 - **Peristalsis**—alternating waves of contraction and relaxation that **squeeze food along the GI tract**
 - **Segmentation**—movement of materials back and forth to **mix the contents in the small intestine**

Digestive System Processes



Peristalsis



Segmentation

Digestive System Processes

- Essential processes of the alimentary canal:
 3. **Mechanical digestion**
 - ✓ Prepares food for further degradation by enzymes
 - ✓ Examples:
 - **Mixing** of food in the mouth by the tongue
 - **Churning** of food in the stomach
 - **Segmentation** in the small intestine






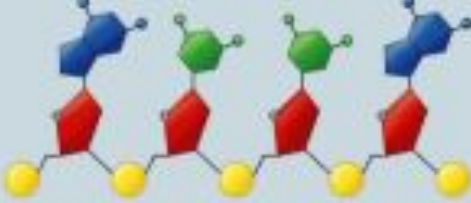
Functions of the Digestive System

- Essential processes of the alimentary canal:

4. Chemical digestion

- ✓ Digestion that occurs when enzymes **chemically break down large molecules into their building blocks**
- ✓ Each major food group uses different enzymes:
 - **Carbohydrates** are broken down to **monosaccharides (simple sugars)**
 - **Proteins** are broken down to **amino acids**
 - **Lipids (fats)** are broken down to **fatty acids and glycerol**

Functions of the Digestive System

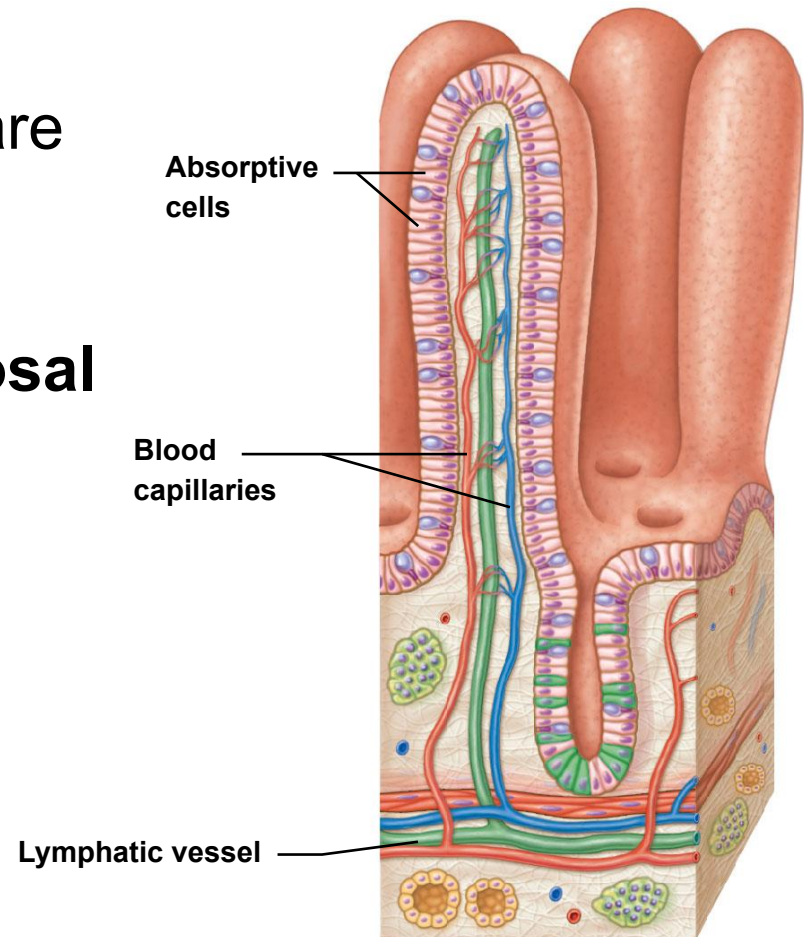
If the monomer is . . .	The polymer is . . .
<p data-bbox="394 434 799 491">A monosaccharide (for example, glucose, fructose)</p> 	<p data-bbox="921 434 1443 491">A polysaccharide (for example, starch, glycogen, cellulose)</p> 
<p data-bbox="394 594 788 651">An amino acid (for example, arginine, leucine)</p> 	<p data-bbox="921 594 1481 679">A polypeptide or protein (A- and B-chains of insulin are polypeptides and insulin is a protein)</p> 
<p data-bbox="394 789 884 846">A nucleotide (sugar, phosphate, base in combination)</p> 	<p data-bbox="921 789 1232 846">A nucleic acid (for example, DNA, RNA)</p> 

Functions of the Digestive System

- Essential processes of the alimentary canal:

5. Absorption

- ✓ End products of digestion are absorbed in the **blood vessels** or **lymph vessels**
- ✓ Food must first enter **mucosal absorptive cells**



Functions of the Digestive System

- Essential processes of the alimentary canal:

6. Defecation

- ✓ **Elimination of indigestible substances in the form of feces**



Squatty Potty



Crash Course

