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 COURSE TITLE: HISTOPATHOLOGY TECHNIQUES AND MUSEUM
 ASSIGNMENT
 1 IN A TABULAR FORM ONLY, COMPARE AND CONTRAST SECTIONS OF THE GASTROINTESTINAL TRACT.
 ANSWERS

The Gastrointestinal Tract is an organ system within humans and other animals which takes in food, digests it to extract and absorb energy and nutrients, and expels the remaining waste as feces. The mouth, esophagus, stomach and intestines are part of the gastrointestinal tract. A tract is a collection of related anatomic structure or a series of connected body organs. The human gastrointestinal tract consists of the esophagus, stomach, and intestines, and is divided into the upper and lower gastrointestinal tracts. The upper consists of the mouth, pharynx, esophagus, stomach and the duodenum and the lower commonly referred to as large intestine begins at the cecum and also includes the appendix (humans only) colon, rectum, and anus. The comparison of the sections of the gastrointestinal tract is:

ESOPHAGUS	STOMACH	SMALL INTESTINE	DUODENUM	JEJENUM	ILEUM	LARGE INTESTINE	ANAL CANAL
<p>ESOPHAGUS</p> <p>*Esophageal</p> <p>Mucosa</p> <p>Non-keratinized stratified squamous epithelium</p> <p>Muscularis mucosae is a single layer of longitudinal oriented smooth muscle</p> <p>*esophageal muscularis externa</p> <p>Upper one third of esophagus.</p> <p>Striated muscle.</p> <p>SEROSA: The esophagus is lined by stratified squamous epithelium without glands. In fish, the esophagus is often lined with columnar epithelium and in amphibians, sharks and rays, the esophageal epithelium is ciliated, helping to wash food along, in addition to the action of muscular peristalsis. The tunica adventitia is the shifting outer fascial layer that allows for free mobility of the esophagus while swallowing. It surrounds the esophagus and surrounding organs such as the trachea, bronchi, and pleural.</p>	<p>STOMACH</p> <p>*Gastric mucosa</p> <p>Gastric glands occupy gastric mucosa.</p> <p>Simple branched tubular glands that extend from muscularis externa to bottom of gastric pits.</p> <p>Consist of mucus neck cells, parietal cells, chief cells, and G cells</p> <p>Lined by simple columnar epithelium. Gastric folds and gastric fluids which are 5 number: pinal cells, chief cells, mucous secreting cells, oxyntic cells, Zymogenic cells. Serosa consists of a secretory epithelial layer and a thin connective tissue layer that reduce the friction from muscle movements.</p>	<p>*Small intestinal mucosa</p> <p>Exhibits numerous projections, or villi, that protrude from epithelial layer of mucosal surface.</p> <p>Villi increases surface area over which digestion and absorption occurs.</p> <p>Epithelial layer of small intestinal mucosa is heterogeneous, composed of:</p> <p>§ mucus-secreting cells (goblet cells)</p> <p>§ Absorptive cells(enterocytes)</p> <p>The outermost layer of the intestine, the serosa, is a smooth membrane consisting of a thin layer of cells that secrete serous fluid, and a thin layer of connective tissues. In the small intestine, the epithelium (particularly the ileum) is specialized for absorption, with villi and microvilli increasing surface area. Comprised of loosely arranged fibroblasts and collagen with the vessels and nerves passing through it.</p>	<p>DUODENUM</p> <p>Duodenal mucosa.</p> <p>Crypts of Lieberkuhn, or intestinal glands, occupy duodenal mucosa.</p> <p>Simple tubular glands that extend from muscularis externa to base of villi.</p> <p>Elaborate small intestinal secretions into lumen of duodenum.</p>	<p>JEJENUM</p> <p>Jejunum</p> <p>Jejunal mucosa</p> <p>Crypts of Lieberkuhn, or intestinal glands, occupy jejunal mucosa</p> <p>Jejunal submucosa</p> <p>Plicae circulares/transverse folds containing a submucosa that extend partially</p>	<p>ILEUM</p> <p>Ileum</p> <p>Ileal mucosa</p> <p>Peyers patches, or aggregation of nodules of unencapsulated lymphatic tissue, occupy ileal lamina propria (and ileal submucosa)</p> <p>M cells, overlying peyer's patches, function as antigen-transporting cells</p> <p>Take up microorganisms and macromolecules</p> <p>Deliver antigens to antigen-processing macrophages</p> <p>Macrophages present processed antigen to lymphocytes</p> <p>Triggers secretory immunity.</p>	<p>LARGE INTESTINE</p> <p>large intestine</p> <p>Colon</p> <p>Colonic mucosa</p> <p>Smooth surface devoid of villi</p> <p>Crypts of Lieberkuhn or intestinal glands, occupy colonic mucosa.</p> <p>Colonic muscularis externa</p> <p>Outer layer of longitudinally oriented smooth muscles organized into 3</p> <p>The serosa is a thin layer of simple squamous epithelial tissue that secretes watery serous fluid to lubricate the surface of the large intestine, protecting it from friction between abdominal organs and the surrounding muscles and bones of the lower torso</p>	<p>Anal canal</p> <p>Anal canal mucosa</p> <p>Keratizing stratified squamous epithelium.</p>
<p>SUB-MUCOSA: The submucosa loosely connects the mucous membrane and the muscular coat. This layer also contains the larger blood vessels, the submucosal(Meissner) nerve plexus, and esophageal glands.</p>	<p>The submucosa is a dense, irregular layer of connective tissue with large blood vessels, lymphatics, and nerves that supports the mucosa.</p>	<p>The submucosa is the layer of dense irregular connective tissue or loose connective tissue that supports the mucosa; it joins the mucosa to the bulk of underlying smooth muscle. Connective tissue layer, which contains blood vessels, lymphatics and the submucosal plexus</p>				<p>The mixture of irregular connective and adipose tissue, numerous blood vessels, and several excellent examples of ganglion cells and nerves of the submucosal plexus. The mucosa is a layer of blood vessels, nerves and connective tissue known as the submucosa, which supports the other layers of the large intestine.</p>	
<p>MUSCULARIS: It consists of scattered bundles of longitudinal muscles fibers and is thickest in the esophagus, where it consists of relatively conspicuous bundles of longitudinal muscle fibers. The muscularis mucosae is thinner in the rest of the tract.</p>	<p>Contains loose connective tissues, blood vessels and the muscularis in the stomach differs from that of other GI organs in that it has 3 layers of muscle instead of 2. Under these muscle layers is the adventitia – layers of connective tissue that are continuous with the omenta. The stomach has a third layer of muscularis externa: the inner oblique layer. This helps churn the chime in the stomach.</p>	<p>The muscularis in the small intestine is made up of a double layer of smooth muscle: an inner circular layer and an outer longitudinal layer. The contractions of these layers promote mechanical digestion, expose more of the digestive chemicals, and move the food along the canal. Consists of two smooth muscle layers; the outer longitudinal layer and inner circular layer. The myenteric plexus lies between them.</p>				<p>The amount of fat and muscularis mucosae has two layers and extends into the intestinal villi, where the smooth muscle cells form a longitudinal bundle in the centre of the villi. The appearance of the muscularis externa is different from that of the small intestine. The muscularis layer surrounds the submucosa and contains many layers of visceral muscle cells that contract and move the large intestine. Continuous contraction of smooth muscle bands in the muscularis produces lumpy, pouch-like structures known as haustra in the large intestine</p>	

SIMILARITIES AMONG THE SECTIONS OF THE GIT:

1. Digestion and absorption are the primary functions of the sections of the gastrointestinal tract.
2. The sections of the gastrointestinal tract are lined by a special layer of cells, called epithelium.
3. Although each section of the tract has specialised functions, the entire tract has a similar basic structure with regional variations.
4. The sections of the GI tract is composed of four layers. Each layer has different tissues and functions. From the inside out they are called: mucosa, submucosa, muscularis, and serosa.