To fully take advantage of this review site, have available your Histology Supplement Sheet, your Van De Graaff text and the Rust text. These micrographs have limitations in color and clarity, and in that they provide only one view of the tissues we are studying. Please review this material "first hand" in the laboratory as often as possible. During the lab exam, you should be able to recognize these tissues, identify the bold faced terms and provide functions as indicated on your Histology Supplement Sheet. The micrographs available for you at this site are:

- **TONGUE**
- **ESOPHAGUS**
- **STOMACH**
- **INTESTINE**
- **PANCREAS**
- **TRACHEA**
- **LUNG**

[HOME] [FUNCTION of the DIGESTIVE AND RESPIRATORY ORGANS] [UNIT THREE PRACTICE TEST]

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**TONGUE with PAPILLAE**

The bracket indicates a single papilla. It is lined with stratified squamous epithelium. Notice the trenches that separate the papillae. Our purpose in viewing this slide is to view the taste buds (A) which open into a trench as seen at the arrow. While the word "taste" most often indicates a "flavor," these structures relay only the sensations of sour, sweet, bitter and salty to the cerebrum.

[TOP] [FUNCTIONS of the Tongue] [HOME]

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**ESOPHAGUS**
This organ is lined with **stratified squamous epithelium** (A). Recall that this is a very protective lining. For this organ it is essential considering the hot drinks and dry crusty food we swallow. While this slide does not show the entire **musculature** of this organ, recall that the inner layer raps the organ in a **circular** direction (B) and the outer layer lies in a **longitudinal** direction. These muscle layers move food by peristalsis.

[TOP] [FUNCTIONS of the ESOPHAGUS] [HOME]

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**STOMACH**

The micrograph at the left provides a view of the musoca (A) of the stomach as well as the musculature (B, C). The micrograph at the right is at a higher magnification, showing only the lining tissue. The **simple columnar epithelial** cells that form the lining are all mucous producing **goblet cells**. Notice that the lining is interrupted by **gastric pits** (A -right). At the base of these pits are glands that produce HCl, intrinsic factor, and pepsinogen. The musculature - seen at the left - of the stomach includes three layers, the inner oblique, the middle circular, and the outer longitudinal layers. It is difficult to separate the **oblique** and **circular** layers (B) on our slides but the **longitudinal** layer is visible at C. If you would like further help understanding these micrographs, check your Van De Graaff text page 778, or the Rust text page 59 and 60.

[TOP] [FUNCTIONS of the STOMACH] [HOME]
At a lower magnification (left micrograph) the villi of the mucosa (A) and the musculature (B) are easily identified. When the mucosa is magnified as in the micrograph at the right, we see that these villi (A) are lined with columnar epithelial cells. Many of these columnar cells are mucus producing goblet cells (B). While not visible at the magnifications possible in our laboratory, the columnar cells have microvilli. The villi and microvilli increase the surface area of the intestine's lumen, increasing the absorption of nutrients from the digested food. The inner circular and outer longitudinal muscle layers move the chyme along by segmentation and peristalsis. See your Van De Graaff text page 781 and 782 and the Rust text page 62 and 63 for additional illustrations.

[TOP] [FUNCTIONS of the INTESTINE] [HOME]

We previously viewed this tissue during our study of the endocrine glands. At that time we were looking for the pancreatic islet (islets of Langerhans) as they produced the hormone, insulin. These islets
still remain the best way to recognize this tissue. (additional micrograph)

Our interest in this tissue, as part of the digestive unit, centers on the exocrine cells. These darker staining cells, that surround the islets, are arranged in acini and secrete their enzymes into ducts which carry the secretions to the duodenum.

TRACHEA

The epithelial lining of this organ is pseudostratified ciliated columnar epithelium (A). While the goblet cells and cilia that are part of this layer were easily visible in the lab, this micrograph is not at a high enough magnification to see them. See Van De Graaff page 113.

As one breathes, the trachea remains open, even under great pressure changes, due to "C" rings of cartilage. This cartilage (B) is hyaline, recognized by the chondrocytes in lacuna and clear matrix.

LUNG
Clusters of alveoli appear as open areas lined with simple squamous epithelium. Gases are exchanged in these alveoli (A). During breathing, air is drawn into the alveoli through the bronchial tree. A small branch of this tree, a bronchiole, is seen at C. Notice the thin layer of muscle surrounding this structure. Constriction of this muscle would cause respiratory distress. The "B" structure is an arteriole. Notice it is very round and has a relatively thick wall. No veins are visible in this micrograph.

[TOP] [FUNCTIONS of the LUNG] [HOME]