

NAME _____

LAB TIME/DATE _____

Anatomy of the Digestive System

General Histological Plan of the Alimentary Canal

1. The general anatomical features of the alimentary canal are listed below. Fill in the table to complete the information.

Wall layer	Subdivisions of the layer	Major functions
Mucosa	1) <i>epithelium</i> ; 2) <i>lamina propria</i> ; 3) <i>muscularis mucosa</i>	<i>absorption secretion</i>
Submucosa	(Not applicable)	<i>vascular supply for mucosa; protection</i>
Muscularis externa	1) <i>circular layer</i> 2) <i>longitudinal layer</i>	<i>churning; mixing; propulsion of food along the tract</i>
Serosa or adventitia	(Not applicable)	<i>protection and anchoring for adventitia; reduction of friction for abdominal organs by serosa</i>

Organs of the Alimentary Canal

- The tube like digestive system canal that extends from the mouth to the anus is known as the alimentary canal or the gastrointestinal (GI) tract.
- How is the muscularis externa of the stomach modified? It has a third (obliquely oriented) muscle layer.
How does this modification relate to the function of the stomach? Vigorous churning activity occurs here.
- What transition in epithelial type exists at the esophagus-stomach junction? Changes from stratified squamous (esophagus) to simple columnar (stomach).
How do the epithelia of these two organs relate to their specific functions?
The esophagus is subjected to constant abrasion (stratified squamous is well adapted for this). The stomach has secretory (and some absorptive) functions and is better protected from acid.
- Differentiate the colon from the large intestine. The large intestine includes the colon, but also includes the cecum, appendix, rectum, and anal canal.
- Match the items in column B with the descriptive statements in column A.

Column Al

1. structure that suspends the small intestine from the posterior body wall

w

2. fingerlike extensions of the intestinal mucosa that increase the surface area for absorption

o

3. large collections of lymphoid tissue found in the submucosa of the small intestine

c

4. deep folds of the mucosa and submucosa that extend completely or partially around the circumference of the small intestine

v

5. mobile organ that manipulates food in the mouth and initiates swallowing

p

6. conduit for both air and food

d

7. food passageway that has no digestive/absorptive function

r

8. folds of the gastric mucosa

h

9. pocketlike sacs of the large intestine

m

10. projections of the plasma membrane of a mucosal epithelial cell

i

11. valve at the junction of the small and large intestines

s

12. primary region of nutrient absorption

e

13. membrane securing the tongue to the floor of the mouth

j

14. absorbs water and forms feces

n

15. area between the teeth and lips/cheeks

b

16. wormlike sac that outpockets from the cecum

u

17. initiates protein digestion

k

18. structure attached to the lesser curvature of the stomach

f

19. covers most of the abdominal organs like an apron

q

20. valve controlling food movement from the stomach into the duodenum

t

21. posterosuperior boundary of the oral cavity

a

22. region containing two sphincters through which feces are expelled from the body

g

23. bone-supported anterosuperior boundary of the oral cavity

Column B

a. anus

b. appendix

c. circular folds

d. esophagus

e. frenulum

f. greater omentum

g. hard palate

h. haustra

i. ileocecal valve

j. large intestine

k. lesser omentum

l. mesentery

m. microvilli

n. oral vestibule

o. Peyer's patches

p. pharynx

q. pyloric sphincter

r. rugae

s. small intestine

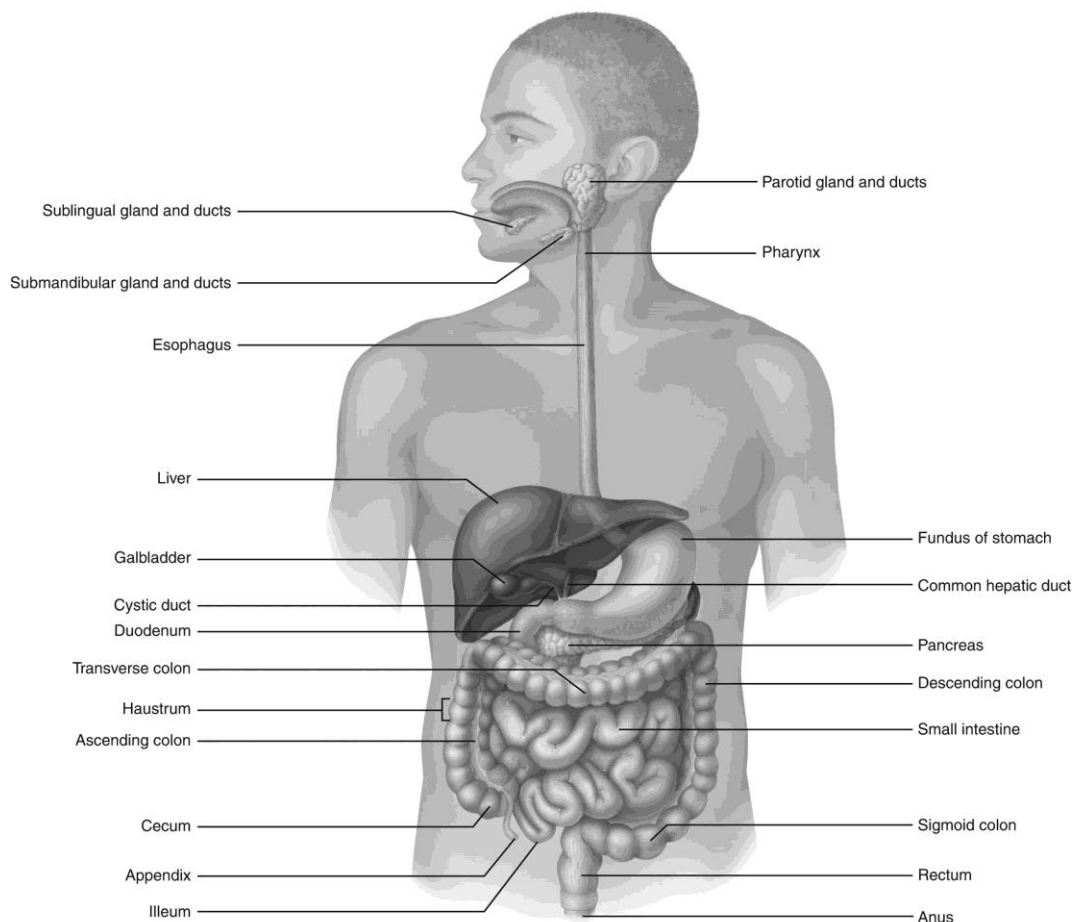
t. soft palate

u. stomach

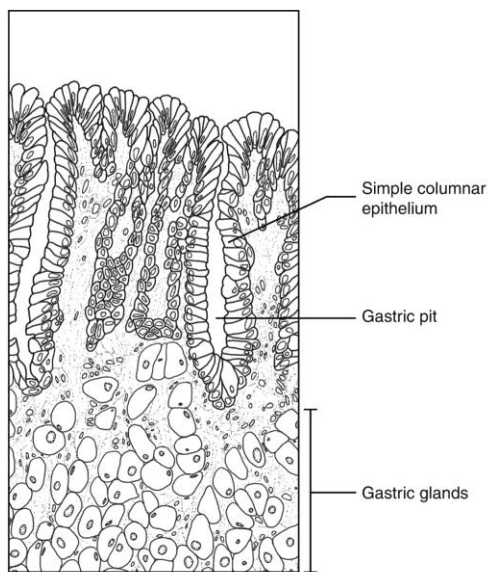
v. tongue

w. villi

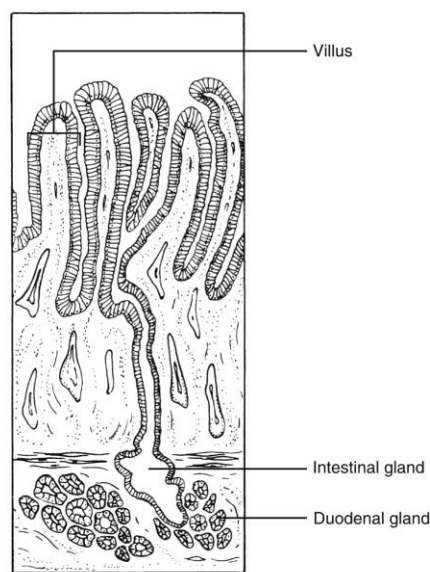
7. Correctly identify all organs depicted in the diagram below.



8. You have studied the histologic structure of a number of organs in this laboratory. The stomach and the duodenum are diagrammed below. Label the structures indicated by leader lines.



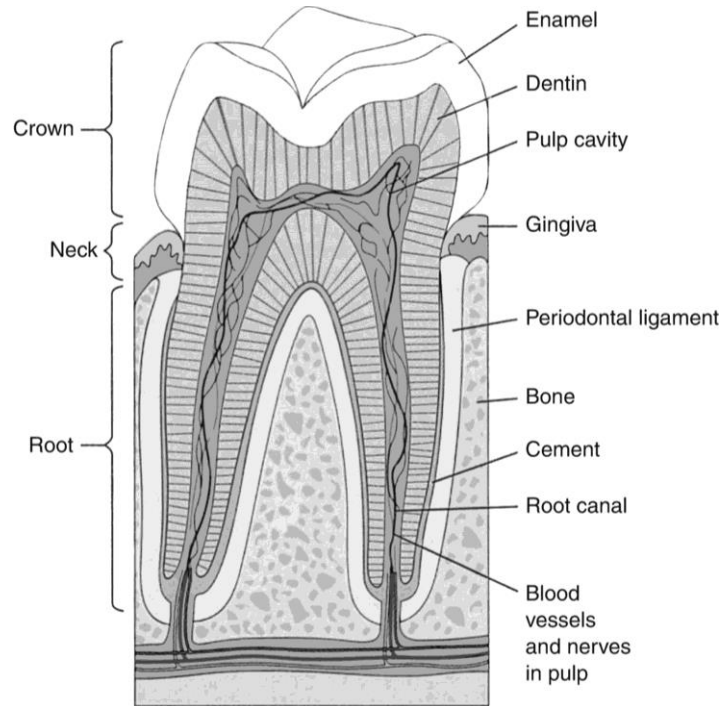
(A) stomach



(B) duodenum

Accessory Digestive Organs

9. Correctly label all structures provided with leader lines in the diagram of a molar below. (Note: Some of the terms in the key for question 10 may be helpful in this task.)



10. Use the key to identify each tooth area described below.

<u> b </u>	1. visible portion of the tooth	Key: a. cement b. crown c. dentin d. enamel e. gingival sulcus f. odontoblast g. periodontal ligament h. pulp i. root
<u> a </u>	2. material covering the tooth root	
<u> d </u>	3. hardest substance in the body	
<u> g </u>	4. attaches the tooth to the tooth socket	
<u> i </u>	5. portion of the tooth embedded in bone	
<u> c </u>	6. forms the major portion of tooth structure; similar to bone	
<u> f </u>	7. produces the dentin	
<u> h </u>	8. site of blood vessels, nerves, and lymphatics	
<u> e </u>	9. narrow gap between the crown and the gum	

11. In the human, the number of deciduous teeth is 20 ; the number of permanent teeth is 32 .

12. The dental formula for permanent teeth is $\frac{2,1,2,3}{2,1,2,3} \times 2$

Explain what this means. There are 2 incisors, 1 canine, 2 premolars, and 3 molars in each jaw (upper and lower) from the median line posteriorly.

2,1,0,2

What is the dental formula for the deciduous teeth? 2,1,0,2 × 2 (20 deciduous teeth)

13. Which teeth are the “wisdom teeth”? The number 3 (most posterior molar)

14. Various types of glands form a part of the alimentary canal wall or duct their secretions into it. Match the glands listed in column B with the function/locations described in column A.

Column A

a

1. produce(s) mucus; found in the submucosa of the small intestine

f

2. produce(s) a product containing amylase that begins starch breakdown in the mouth

e

3. produce(s) many enzymes and an alkaline fluid that is secreted into the duodenum

d

4. produce(s) bile that it secretes into the duodenum via the bile duct

b

5. produce(s) HCl and pepsinogen

c

6. found in the mucosa of the small intestine; produce(s) intestinal juice

Column B

a. duodenal glands

b. gastric glands

c. intestinal crypts

d. liver

e. pancreas

f. salivary glands

15. Which of the salivary glands produces a secretion that is mainly serous? Parotid

16. What is the role of the gallbladder? To store and concentrate bile made by the liver.

17. Name three structures that form a portal triad of the liver. Branch of the bile duct, branch of the hepatic artery, and branch of hepatic portal vein

18. Where would you expect to find the stellate macrophages of the liver? Lining the sinusoids
What is their function? Phagocytosis of debris and worn out blood cells.

19. Why is the liver so dark red in the living animal? Because it is a blood reservoir

20. The pancreas has two major populations of secretory cells—those in the islets and the acinar cells. Which population serves the digestive process? Acinar cells