

13 Basic Mammalian Anatomy I

(LM pages 159–72)

Time Estimate 2.0 hours

Notes

Dissecting tools. As an alternative to a complete set of dissecting tools, two sizes of sharp scissors, forceps, and blunt probes can be used. Scalpels can be kept at the instructor's bench to be used at the instructor's discretion.

Safety. All exercises in this lab require the use of chemicals. Safety goggles, latex and non-latex gloves, and lab coats or other clothing protection are recommended.

MATERIALS AND PREPARATIONS¹

Special Requirements

Preserved specimens. Preserved fetal pigs are required for this lab.

13.1–13.6 All Dissection Exercises (LM pages 160–70)

- _____ video (optional): *The Anatomy of the Fetal Pig* (Carolina 49-3075V)
- _____ safety goggles (See Carolina's Safety: Face Protection Section)
- _____ latex gloves and/or non-latex gloves (See Carolina's Safety: Hand Protection Section)
- _____ lab coats (See Carolina's Safety: Body Protection Section) or other clothing protection
- _____ fetal pigs, preserved, for dissection (Carolina 22-8420 to -8422)
- _____ dissecting pans, pins, tools, and trays (see Carolina's Dissecting Instruments and Supplies section)
- _____ pencils
- _____ pipettes, glass dropping (Carolina 73-6319)(for suctioning off excess fluids)
- _____ labels, for labeling individual pigs
- _____ "pig dip" bucket containing preservative (or preservative in spray bottles)
- _____ string, heavy, for tying pigs into dissection pans and for tying bags
- _____ plastic bags or containers for storing pigs

Fetal pigs. Fetal pigs for dissection are available from many supply houses. Large, double-injected specimens are recommended.

Preparing fetal pigs. Soak the pigs in water overnight to decrease the smell and concentration of preservatives to which students and instructors are exposed.

Storing fetal pigs. Before placing pigs into the plastic storage bags, have students pick them up by strings tied around the pigs' hind legs. Dip pigs in a "pig dip" bucket containing preservative. Alternatively, spray pigs with preservative from a spray bottle before storing.

13.7 Human Anatomy (LM page 171)

- _____ model, human torso *or*
- _____ *Dimensional Man* paper model (ISBN 0-671-70342-0, Fireside Books, Simon and Schuster 1990.)

Human torso model. Human torso models are available from a number of supply houses. The Carolina Biological Supply Company has a variety of torso models that vary widely in price. See Carolina's "Models" section. The *Dimensional Man* paper model is an inexpensive alternative to the torso model.

¹ Instructions are grouped by exercise. Some materials may be used in more than one exercise.

EXERCISE QUESTIONS

13.1 External Anatomy (LM pages 160–61)

Observation: External Anatomy (LM pages 160–61)

Body Regions and Limbs (LM page 160)

5. Where is the heel of the pig? *Raised up, off the ground*

Umbilical Cord (LM page 160)

3. What is the function of the umbilical cord? *It contains the umbilical blood vessels which take blood to the placenta where fetal blood gives up waste and receives oxygen and nutrients.*

Nipples and Hair (LM pages 160–61)

1. How many nipples does your pig have? *Both male and female pigs have 16 nipples.*
When is it advantageous for a pig to have so many nipples? *when it is a nursing mother*
2. Can you find hair on your pig? *yes* Where? *on the eyelashes and on the chin*

Anus and External Genitals (LM page 161)

1. The anus is an opening for what system in the body? *digestive system*
4. What sex is your pig? *See laboratory manual (page 161) for directions on sexing pigs.*

13.2 Oral Cavity and Pharynx (LM pages 162–63)

Observation: Oral Cavity and Pharynx (LM pages 162–63)

Pharynx (LM page 163)

6. Explain why it is correct to say that the air and food passages cross in the pharynx. *Air must pass from the back to the front of the pharynx to enter the trachea, and food must pass from the front to the back of the pharynx to enter the esophagus.*

13.3 Thoracic and Abdominal Incisions (LM pages 164–65)

Thoracic Incisions (LM page 164)

3. List the organs you find in the thoracic cavity. *The heart and lungs are readily apparent.*

Abdominal Incisions (LM page 164)

10. Anatomically, the diaphragm separates what two cavities? *the thoracic and abdominal cavities*
11. List the organs you find in the abdominal cavity. *The liver and intestines are readily apparent.*

13.5 Thoracic Cavity (LM pages 166–67)

Observation: Thoracic Cavity (LM page 166)

Heart and Lungs (LM page 166)

3. Trace the path of air from the nasal passages to the lungs. *nasal passages, pharynx, glottis, larynx, trachea, bronchi, lungs*

13.6 Abdominal Cavity (LM pages 168–70)

Observation: Abdominal Cavity (LM pages 168–70)

Liver (LM page 168)

3. Name several functions of the liver. *destroying red blood cells, producing bile, storing glycogen, maintaining blood glucose levels, producing blood proteins*

Stomach and Spleen (LM page 168)

4. **The stomach is a part of what system?** *the digestive system*
What is its function? *stores food, secretes gastric juice, contains an enzyme for protein digestion*
5. **The spleen is a part of what system?** *the lymphatic system*
What is its function? *purifies blood and disposes of worn-out red blood cells*

Small Intestine (LM page 170)

3. **The small intestine is a part of what system?** *the digestive system*
What is its function? *food digestion and absorption of the products of digestion*

Gallbladder and Pancreas (LM page 170)

3. **What is the function of the gallbladder?** *stores and releases bile*
4. **What is the function of the pancreas?** *As an exocrine gland, it secretes pancreatic juice; as an endocrine gland, it secretes insulin and glucagon.*

Large Intestine (LM page 170)

4. **The large intestine is a part of what system?** *the digestive system*
5. **What is the function of the large intestine?** *absorbs water, prepares feces for defecation*
6. **Trace the path of food from the mouth to the anus.** *mouth, pharynx, esophagus, stomach, small intestine, large intestine (colon and rectum), anus*

13.7 Human Anatomy (LM page 171)

Observation: Human Torso (LM page 171)

2. **From your studies so far, list any major differences between pig internal anatomy and human internal anatomy that you have identified.** *Most differences in the internal anatomy studied so far are minimal.*

LABORATORY REVIEW 13 (LM page 172)

1. **In the fetal pig, what sex has a urogenital opening beneath the papilla just superior to the anus?** *female*
2. **What two characteristics do all mammals have?** *mammary glands and hair*
3. **The esophagus connects the pharynx with which organ?** *stomach*
4. **What is the hard portion of the roof of the mouth called?** *hard palate*
5. **What is the opening to the trachea called?** *glottis*
6. **Name the largest organ in the abdominal cavity.** *liver*
7. **What structure separates the thoracic cavity from the abdominal cavity?** *diaphragm*
8. **Name the structure just dorsal to the thyroid gland.** *trachea*
9. **What structure covers the glottis?** *epiglottis*
10. **If a probe is placed through the glottis, it will enter what structure?** *larynx*
11. **The heart is located in what cavity?** *thoracic*
12. **What organs are in the pleural cavity?** *lungs*
13. **The stomach connects to what part of the small intestine?** *duodenum*
14. **Identify the gland that is located by lifting the stomach.** *pancreas*
15. **Name a lymphoid organ in the abdominal cavity.** *spleen*
16. **Is the spleen located on the right or left side of the abdominal cavity?** *left*
17. **The pancreas belongs to what system of the body?** *digestive/endocrine*
18. **Where do air and food passages cross one another?** *in the pharynx*
19. **What organ releases bile?** *the gallbladder*

Thought Questions

20. **What difficulty would probably arise if a person were born without an epiglottis?** *When the person swallows, food will enter the trachea.*
21. **A large portion of the abdominal cavity is taken up by digestive organs. Which organs are these?** *The digestive organs are the stomach, the small intestine, the large intestine, and the rectum.*
22. **The small intestine exists as a series of folds and coils. What might be the advantage of such a configuration?** *The folds and coils increase the surface area of the small intestine for absorption without taking up more room in the abdominal cavity.*
23. **Difficulties maintaining blood glucose level, bile production, and the production of blood proteins might be associated with problems in what organ?** *the liver*