Fetal Pig Dissection Day 2 - Circulatory and Respiratory Systems

Dissection Roles (choose a different role from Day 1):

- **Recorder** - reads directions out loud to group and records answers for group
- **Dissector** - responsible for using the dissecting instruments to make incisions in the pig; can also get assistance from group members
- **Facilitator** - obtain materials, keeps track of time, aids in dissection, asks teacher for help when needed

1. Obtain your face shield and apron from the cabinet, and a new pair of gloves. You will be wearing the protective gear for the entire lab.

2. Obtain dissection materials for your group (plastic lid, instruments: scalpel, scissors, dissecting probes, forceps, pins, ruler) and bring to your table.

3. Obtain your group’s fetal pig from the teacher. Take it out of the large plastic bag and the clipped smaller plastic bag and place the pig on your tray. Please keep the bag, elastic, and spring clips neatly in one place.

**Part A. The Incision**

4. Place the fetal pig ventral side up in the dissecting tray. You are preparing to make the first incisions.

5. Study the diagram (Figure 1) to the right. The lines numbered #1-4 show where incisions should be made. To open the chest, begin with incision #1. With forceps, life the thick skin and related tissue to be cut, beginning at the belly. Make a small slit with a scalpel. Then use scissors to extend the cut to the chin. Point the scissors upwards and cut away from yourself. Be very careful in the neck area to avoid disturbing any glands. You will be cutting through the muscle. It is better to carefully cut twice rather than damage the organs beneath the muscle with one deep cut.

6. Make the incisions labeled #2 and #3. Next, follow line #4 as a guide to cutting around the umbilical cord, and fold back the thick skin flaps.
7. Using the diagram (Figure 2) below, locate the liver (the largest organ), and observe the **umbilical vein** that runs from the liver to the umbilical cord. Cut the vein. Now you can fold down the area that contains the umbilical cord. **Note: dissecting pins can be used to hold back the skin.**

8. Fold back the sides of the body wall away from the midline and pin them down. Note the ribs in the inner walls of the thorax.

9. If your specimen is filled with liquid, rinse it out under cold running water and drain out the body cavity. If it’s only a little liquid, you can use paper towels to absorb it.
Part B. The Circulatory & Respiratory Systems

10. Use Figure 3 as a guide to find the heart in the center of the chest cavity. It is located between the lungs and is surrounded by a moist thin membrane called the pericardium. Use forceps to carefully remove the ventral part of the pericardium so that the heart is exposed. Do not damage the nearby lungs. What is the function of the pericardium?

11. Compare the appearance of the pig’s heart to Figure 4. Use a reference to help you identify the lettered parts. Write the correct number from the ‘Names’ list in the proper blank in the ‘Parts’ list.

<table>
<thead>
<tr>
<th>Parts</th>
<th>Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>1. left atrium</td>
</tr>
<tr>
<td>b.</td>
<td>2. aorta</td>
</tr>
<tr>
<td>c.</td>
<td>3. right ventricle</td>
</tr>
<tr>
<td>d.</td>
<td>4. coronary artery and vein</td>
</tr>
<tr>
<td>e.</td>
<td>5. right atrium</td>
</tr>
<tr>
<td>f.</td>
<td>6. pulmonary artery</td>
</tr>
<tr>
<td>g.</td>
<td>7. left ventricle</td>
</tr>
</tbody>
</table>

12. Raise the posterior end of your pig’s heart. Behind the heart you will see large veins that return blood from various parts of the body to the upper heart chambers. This is the vena cava.

13. Push the lungs toward the pig’s right side. You should be able to see a large blood vessel (the aorta) extending down from the heart and lying along the spinal column.
   a. Is the aorta an artery or vein?
   b. What is the function of the aorta?
14. Remove the heart by using scissors to cut the attached blood vessels and other tissues that are holding it in place. **BE CAREFUL NOT TO INJURE THE NEARBY LUNGS.** Cut the heart into a front (ventral) and a back (dorsal) half using a scalpel with a sawing motion. DO NOT cut the heart into right and left halves. **KEEP YOUR FINGERS OUT OF THE PATH OF THE SCALPEL.**

   a. Which chamber has the thickest walls (left/right atrium/ventricle)?

   b. Which chamber has the thinnest walls (left/right atrium/ventricle)?

   c. The heart is a muscle. Which heart chamber does the most work?

   d. Note the flaps that separate each atrium from the ventricle. What are these flaps called and what do they do?

15. Examine the **lungs**.

   a. How many lobes (sections) do you see in the right lung?

   b. How many lobes do you see in the left lung?

16. Refer to Figure 5. Use a probe in the neck region to carefully push aside nearby connective tissue and muscles in order to expose the **trachea** (windpipe). The trachea is a long tube composed of ring-like sections. It leads from the glottis in the mouth down to the lungs. Be sure to expose the slight bulge at the top of the trachea. This is the voice box or **larynx**. Label the trachea and larynx on Figure 5.

![Figure 5](image-url)
17. Remove tissue covering the lower portion of the trachea where it approaches the lungs. The trachea sends branches into each lung. Each branch is called a **bronchus** (the plural is bronchi). Label the left and right bronchi on Figure 5.

18. Find the **diaphragm**. It is a sheet of muscle shaped like an upside-down bowl. Label the diaphragm on Figure 5.
   
   a. What is the function of the diaphragm?
   
   b. All of the structures pictured in Figure 5 work together to perform the function of __________________________.

19. Lift the trachea with forceps and look at its back surface. You will see another tube clinging to the surface of the trachea. This tube is the **esophagus**, which carries food from the mouth to the stomach. Carefully use a probe to separate these two tubes from each other. **CAUTION: AS YOU PERFORM STEPS 20 AND 21, BE CAREFUL THAT YOU DO NOT REMOVE OR DAMAGE THE ESOPHAGUS.**

20. Use scissors to cut the top of the trachea free from the throat. Make your cut above the larynx.

21. Use your fingers to raise the lungs. With a scalpel, carefully cut them free from underlying tissues. The lungs and trachea can now be lifted from the chest cavity in one piece.

22. Examine the respiratory organs you have just removed. Starting where a bronchus enters the lung, push aside the lung tissue to reveal the branches.
   
   a. What are these smaller branches called?
   
   b. What is the texture of the lung tissue?
   
   c. Squeeze the trachea between your fingers. Describe it. Is it soft or firm? Why do you think this is so?

**DONE WITH CIRCULATORY & RESPIRATORY SYSTEM DISSECTION**

Go to clean up instructions ☁
CLEAN UP INSTRUCTIONS:

- Place all organs, excess skin, etc. that you have cut out of the pig today into the red BIOHAZARD bag that Ms. Ciovacco will come around with.

- Bring all of your dissection materials to a sink and rinse them off WELL.

- Thoroughly dry your instruments and dissecting tray as well as possible with paper towels.

- Return your pig to the smaller bag, roll the bag up tightly to form a good seal, and place spring clips on the top. Then place the small bag inside the larger bag. Secure with a rubber band.

- Return your clean and dry lab equipment and pig to the supply cart. Remove your gloves and throw them in the trash. Return your face shield and apron to the cabinet.

- Wipe down your lab bench with disinfectant spray and paper towels.

- WASH YOUR HANDS THOROUGHLY WITH SOAP AND WATER BEFORE YOU LEAVE!!!