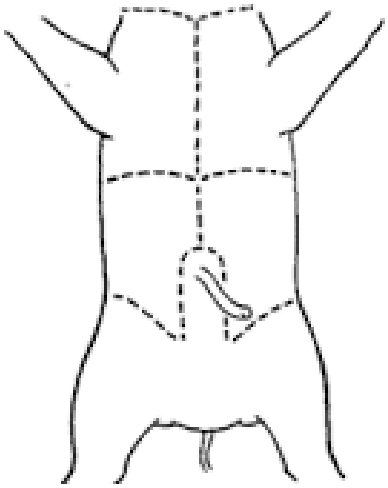
Lab 28: Fetal Pig Dissection – Day 2 Instructions

Preparing Specimen for Dissection:

Follow the instructions below to prepare and dissect the digestive system of your pig. Be sure to complete the table for the digestive system observations and to draw and label each structure in figures 1 & 2.



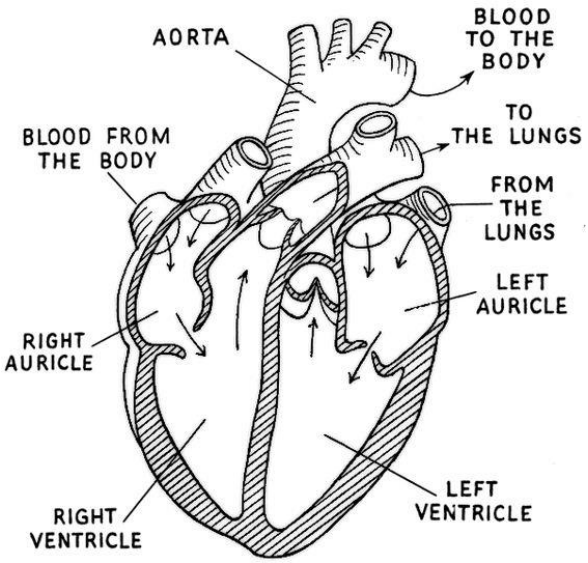
1. Prepare your pig for dissection by doing the following:
    a. Place your blue dissection mat on the blue lab tray. While one student holds down the pig and holds open the forelegs, tie the provided twine around one of the forelegs at the wrist joint. Wrap the string UNDER the blue lab tray pulling the twine so the tied foreleg is held open. Tie the twine around the other foreleg. The forelegs should now be pulled open and out of the way for dissection.
    b. Complete the above for the hind legs as well. The tighter the better to hold open the legs and expose the ventral side of the pig.
2. Now your pig is prepared for the initial cuts of your dissection. Cut your pig following the instructions below. You should be using your SCISSORS to avoid damaging underlying organs.
    a. Hold scissors parallel to the pig's ventral (belly) side. When cutting, left the scissors upward with every cut to make sure you don't damage internal organs. Pierce a small hole in the loose skin between the hind legs.
    b. Cut in the same lines that are found in the diagram to the right. Be sure to cut AROUND the umbilical cord. In addition, cut ALL the way up to the mandible (lower jaw) to see up into the throat area of the pig. As you are cutting upward into the thoracic cavity (upper chest) you will cut through bone (the rib cage), cut carefully and slowly as you get to this point.
    c. Just as you did with the frog, when cutting the horizontal lines, cut all the way around to the back as you cut under the armpits and over the hips. This will allow the flaps of skin and muscle tissue to stay open and out of your way.

Digestive System Anatomy:

1. With your pig open, you may first notice a dividing structure that indicates the upper thoracic cavity and the lower abdominal cavity. This is the **diaphragm** of the respiratory system. You may need to cut away portions of this to access different portions of the anatomy. When you get to the respiratory system, remember the location and appearance of this muscular structure.
2. For all the following instructions, be sure to diagram each item in figure 1 and describe each structure in the table.
3. In the lower portion of body cavity (the abdominal cavity), first identify the large organ of the **liver**, which has five different lobes. Gently lift up the liver and locate the **gall bladder** that will be on the pig's right side. Once these two structures have been identified, CAREFULLY, using scissors, remove them from the pig.
4. Locate the **stomach** on the upper left side of the abdominal cavity, underneath the liver. The **stomach** resembles a pouch and is connected to the **esophagus**. Using your scalpel slit open the stomach and observe the rugae or rigid lines inside the stomach. These are to allow the stomach to stretch as it is filled.
5. At the top of the stomach is the **esophagus**, which will through to the diaphragm up the throat and open into the mouth.
6. The end of the stomach leads to the **small intestine**. The first 3-4 cm of the small intestine is called the duodenum portion, the remaining length is divided into the ileum and jejunum portions.
7. Observe that the small intestine is not loose in the abdominal cavity but is held together in place by the **mesentery** tissue. Check for arteries and veins in the clear mesentery that absorb nutrients digested in the small intestine to then be transported all over the pig's body.
8. The **large intestine** appears as a compact coil and is larger in diameter than the small intestine. Location the junction of the large and small intestine. Below this junction is a small pouch-like structure called the **caecum**. This is the same as the appendix in humans, which helps in the slow digestion of plant materials in other animals.
9. Follow the large intestine to the **rectum**. This lies toward the dorsal side of the abdominal cavity and is the straight end portion of the large intestine. This is where water and some minerals are absorbed into the blood stream. Waste material is stored in the rectum until it is eliminated through the **anus**.
10. Locate the **pancreas** which is a large white grainy organ located below the stomach. The pancreas makes a variety of digestive enzymes that travel to the small intestine.
11. The **spleen** is a red elongated organ extending around the curvature of the stomach. This helps to destroy old red blood cells.
12. CAREFULLY cut the esophagus below the diaphragm and cut the end of the stomach. Carefully remove these two structures and set aside. You may have to trim away the clear peritoneum that holds the organs in place in the abdominal cavity. Then carefully cut out the small intestine and the large intestine cutting at the rectum to remove.

Circulatory System Anatomy:

1. Above the diaphragm, make sure you have cut through the sternum (chest bone) and ribs to expose the thoracic cavity.
2. Locate the **heart**. Surrounding the heart should be a thin membrane called the pericardial sac.
3. Coming out from the top of the heart is the **aorta artery** that leaves the top of the heart and curves around to go to the lower part of the body. Gently lift the heart to identify the aorta traveling down the dorsal side of the body.
4. Separating from the aorta and traveling up to the head of the pig are two arteries called the **carotid arteries** that supply the cranial region and brain with blood.
5. On the heart are the **coronary vessels** that supply blood the heart muscles.
6. Again lift the heart to look on the dorsal side to observe the anterior and posterior **vena cava veins** that bring deoxygenated blood from the body back to the heart.
7. In the abdominal cavity, find the aorta that has descended downward. Look for where the aorta divides into two branches that will provide blood to the legs of the pig. These are called the **femoral arteries**.
8. CAREFULLY remove the heart from the pig and lay it on your dissecting tray laying in the SAME direction as it was in the body of the pig. Using your scalpel, carefully slice the heart open by gently laying your fingers on the heart and slicing the heart parallel to the dissecting mat. Cut as close to the middle as possible.
9. Looking at one half of the heart, attempt to identify the four chambers of the heart: two atria (upper chambers) and two ventricles (two lower chambers). Note that the heart is made up of dense muscle tissue for pumping blood. Observe the diagram of the heart to the right to attempt to identify these structures.



Respiratory System Anatomy:

1. Now that the heart is removed, there should be two spongy **lungs** on the left and the right of where the heart would be.
2. Below the lungs is the **diaphragm** which aids in the inhale and exhale for breathing. The diaphragm will contract and push down on the abdominal organs allow the lungs to expand for an inhale. Then the diaphragm will relax pushing the lungs back up causing an exhale.
3. The two lungs are connected to the **trachea** in the throat. Note the texture of the trachea. There are small cartilage rings in the trachea to keep it open to allow air in and out of the lungs.
4. The trachea branches into the two **bronchial tubes** that connect to the lungs (this forms the upside down Y from the trachea to the lungs). These may be difficult to locate and identify.
5. Lying on top of the trachea, locate the V-shaped structure called the **thyroid gland**. The thyroid gland releases hormones that control growth and metabolism.
6. Moving toward the head on the trachea you can find a hard light colored structure called the **larynx** also known as the voice box that allows the pig to make sounds.
7. Once you have identified these structures, carefully remove the lungs by clipping the trachea close to the lung structures. You do not need to remove the trachea.

Honors Biology **Due by Friday May 19th**

Name: _____ Period: _____

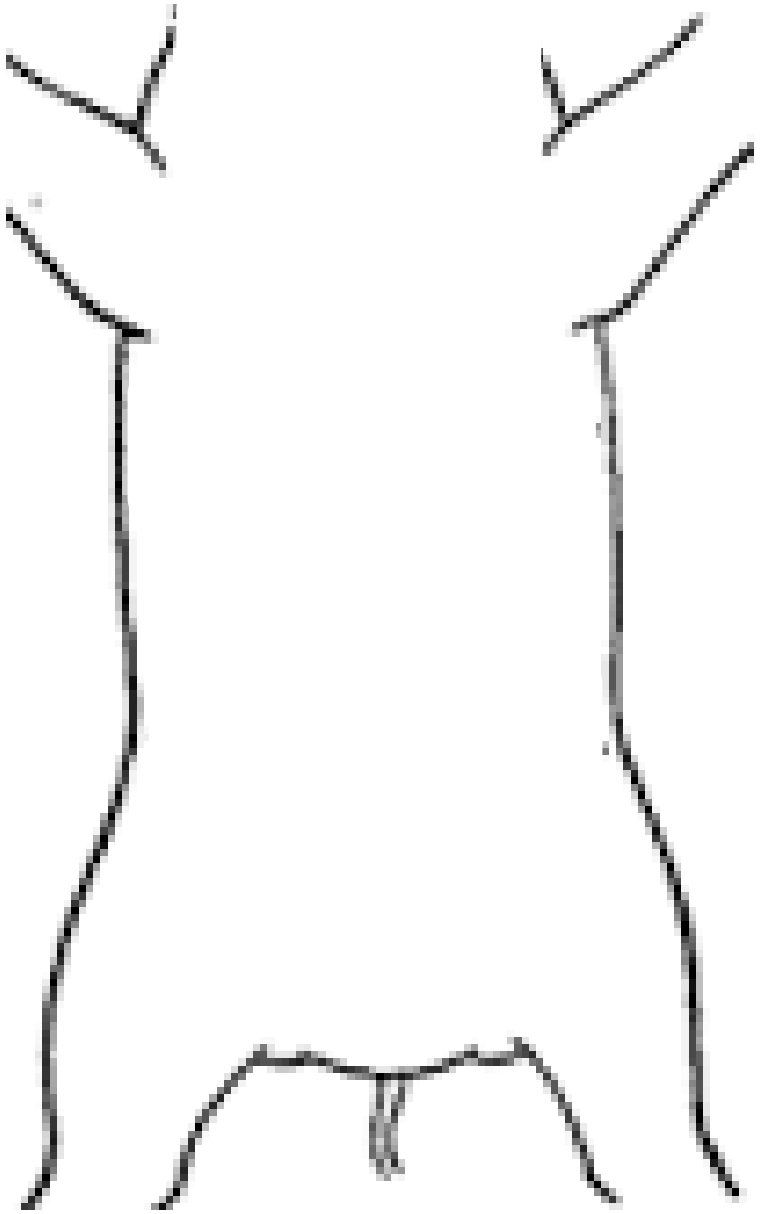
Lab 28: Fetal Pig Dissection – Day 2

Day 2: Digestive, Circulatory, & Respiratory Systems

Digestive System:

Structure	Number	Description
Liver		
Gall Bladder		
Esophagus		
Stomach		
Small Intestine		
Mesentery		
Large Intestine		
Caecum		
Rectum		
Anus		
Spleen		
Pancreas		

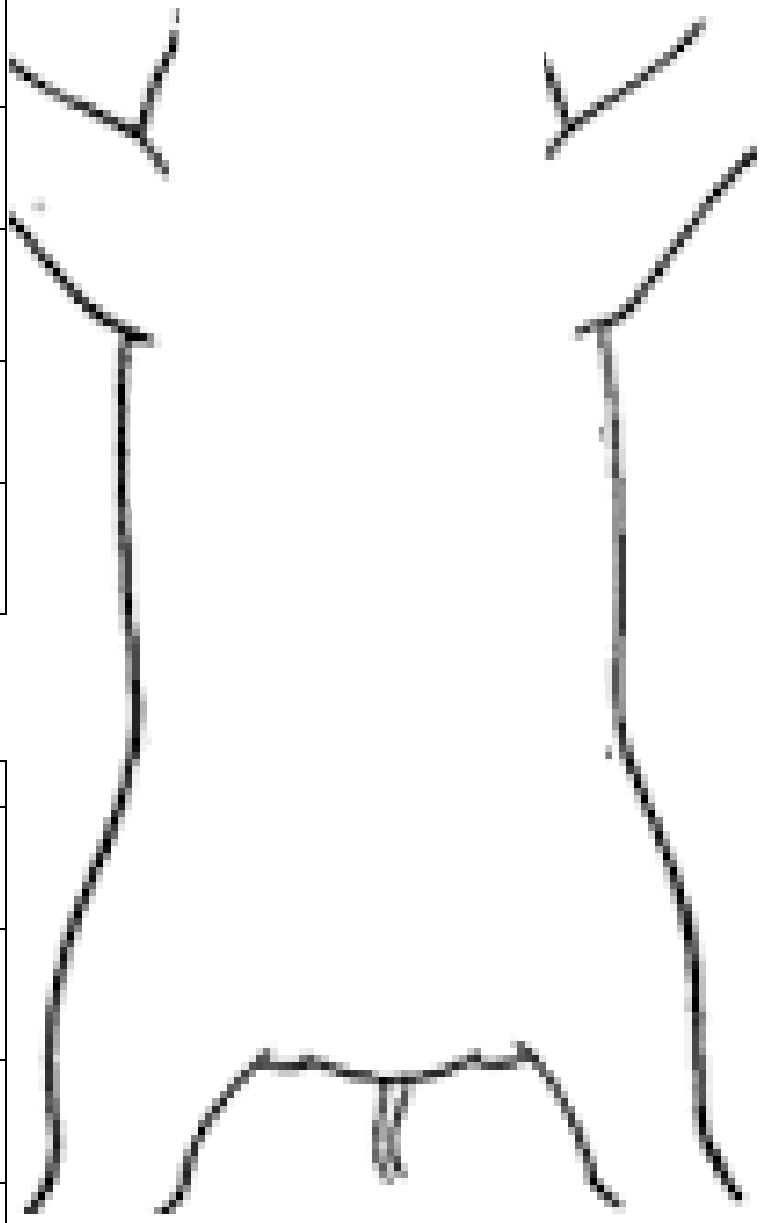
Figure 1: Digestive System



Circulatory System:

Structure	Number	Description
Heart		
Aorta Artery		
Carotid Arteries		
Coronary Arteries		
Vena Cava Veins		
Femoral Arteries		

Figure 2: Circulatory & Respiratory Systems



Respiratory System:

Structure	Number	Description
Diaphragm		
Lungs		
Trachea		
Bronchial Tube(s)		
Thyroid Gland		
Larynx		