

Pig heart dissection Lab

Materials:

Preserved pig heart
Spray bottle filled with water
Dissecting pan
Dissecting supplies

Purpose of this lab: To review the structural characteristics of the human heart and to examine the major features of a mammalian heart.

Before proceeding to Procedure, read through the Analysis Questions as you should be answering these as you dissect the pig heart.

Procedure A—Dissection of a Pig Heart.

1. Obtain a preserved pig heart. Rinse it in water thoroughly to remove as much of the preservative as possible. Also run water into the larger blood vessels to force any blood clots out of the heart chambers.

2. Place the heart in a dissection tray with its ventral surface up (See Figure 1 below). Proceed as follows:

- a. Locate the *visceral pericardium*, which appears as a thin, transparent layer on the surface of the heart. Use a scissors to remove a portion of this layer and expose the *myocardium* beneath. Also note the abundance of fat along the paths of various blood vessels. This adipose tissue occurs in the loose connective tissue that underlies the visceral pericardium.
- b. Identify the following on the exterior (outside) of the heart:
right atrium, right ventricle, left atrium, left ventricle, coronary arteries

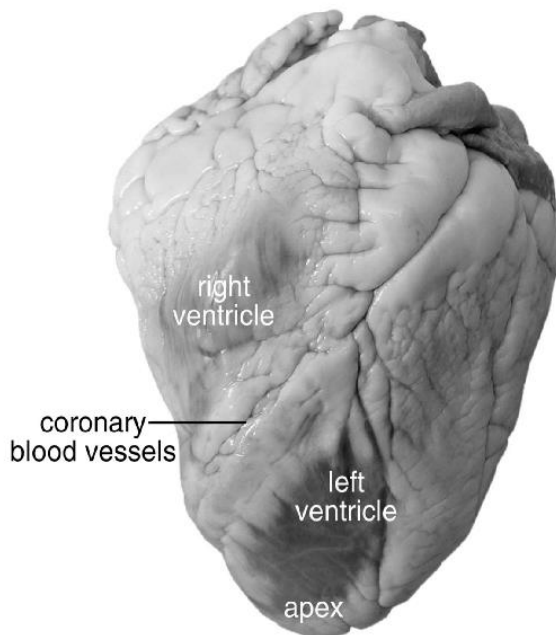


Figure 1: Ventral view of Heart

Figure 2: Dorsal view of Heart

3. Examine the dorsal surface of the heart (Figure 2). Locate the stumps of two relatively thin-walled blood vessels that enter the right atrium. Demonstrate this connection by passing a slender probe through them. The upper vessel is the *superior vena cava*, and the lower one is the *inferior vena cava*.
4. Open the *right atrium*. To do this, follow these steps:
 - a. Insert a blade of the scissors into the *superior vena cava* (Figure 3) and cut downward through the atrial wall.
 - b. Open the chamber, locate the *tricuspid valve* and examine its cusps.
 - c. Using a spray bottle, run some water through the tricuspid valve to fill the chamber of the *right ventricle*. Be sure to answer question #5 in your lab report while doing this.
 - d. Gently squeeze the ventricles and watch the cusps of the valve as the water moves up against them.
5. Open the *right ventricle* as follows:
 - a. Continue cutting downward through the *tricuspid valve* and the *right ventricular wall* until you reach the apex of the heart.
 - b. Find the opening to the *pulmonary trunk* and the *pulmonary valve*.
 - c. Examine the valve and its cusps.
6. Open the left side of the heart. To do this, follow these steps:
 - a. Insert the blade of the scissors through the apex of the heart at the left ventricle. Cut upward, dividing the heart into "front" and "back" halves by cutting along the *left ventricle*, up through the *left atrium*.
 - b. Open the *left atrium* and locate the four openings of the *pulmonary veins*. Pass a slender probe through each opening and locate the stump of its vessel.
 - c. Examine the *bicuspid valve (mitral valve)* and its cusps.
 - d. Also examine the *left ventricle* and compare the thickness of its wall with that of the *right ventricle*.
7. Locate the *aorta*, which leads away from the *left ventricle*, and proceed as follows:
 - a. Compare the thickness of the *aortic wall* with that of the *pulmonary trunk*.
 - b. Use scissors to cut along the length of the *aorta* to completely divide the heart into two halves and expose the *aortic valve* at its base.
 - c. Examine the cusps of the valve and locate the openings of the *coronary arteries* just distal to them.

8. As a review, locate and identify the stumps of each of the major blood vessels associated with the heart.
9. Discard the specimen as directed.
10. Locate the parts of the heart (labeled on the human heart diagram of your lab report) on a dissectible heart model.
11. Complete your lab report.

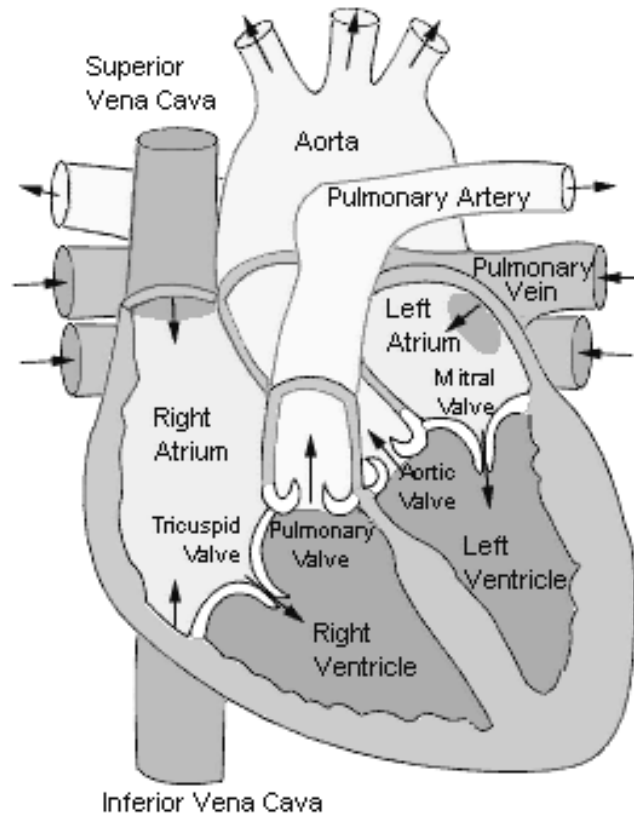


Figure 3: Interior view of Heart

Identification List:

- | | |
|-------------------------------|--------------------|
| aorta | pericardium |
| aortic valve | pulmonary trunk |
| bicuspid valve (mitral valve) | pulmonary valve |
| coronary arteries | pulmonary veins |
| inferior vena cava | right atrium |
| left atrium | right ventricle |
| left ventricle | superior vena cava |
| myocardium | tricuspid valve |

Analysis Questions

1. How can you tell which side of the heart is the ventral surface?
2. How many chambers are found in the mammalian heart? List these chambers.
3. Which chambers are the pumping chambers of the heart?
4. Which chambers are the receiving chambers of the heart?
5. Describe the action of the tricuspid valve when you squeezed the water-filled right ventricle.
6. Compare the structure of the tricuspid valve with that of the pulmonary valve.
7. How do the walls of the atria compare with the walls of the ventricles and why are they different?
8. What is the purpose of heart valves?
9. Name & compare the heart valves found between the upper & lower chambers of the right and left sides of the heart.

10. Vessels that carry blood away from the heart are called _____, while _____ carry blood toward the heart.

11. Which artery is the largest and why?

12. What is the purpose of the coronary artery and what results if there is blockage in this vessel?

13. Can an artery carry deoxygenated blood? Explain using an example.

14. Using words, fill in the flow chart below tracing blood flow through the major blood vessels and heart, starting with deoxygenated blood returned from the body.

