

# Cardiovascular System Lab – Part 1

## The Heart

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### Heart

#### Location and description of the heart

Utilizing the skeleton and the torso model:

- Your heart is about the size of your \_\_\_\_\_.
- Location of the heart
  - Name the bony structure that protects the heart anteriorly. \_\_\_\_\_
  - On what structure does the heart rest inferiorly? \_\_\_\_\_
  - Is the heart's apex positioned slightly right or left of midline? \_\_\_\_\_

#### Gross anatomy of the heart

Utilizing a heart model:

- Name the double-walled sac that surrounds the heart \_\_\_\_\_
- Describe the three layers that comprise the wall of the heart
  1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_
- Locate, name and describe the functions of the four chambers of the heart
  
- Locate, name and describe the functions of the four valves of the heart

#### Pulmonary, Systemic, and Cardiac Circulations

Create a flowchart tracing the pathway of blood through the heart and body/lungs. Your discussion should compare the pulmonary and systemic circulations.

#### Microscopic anatomy of cardiac muscle

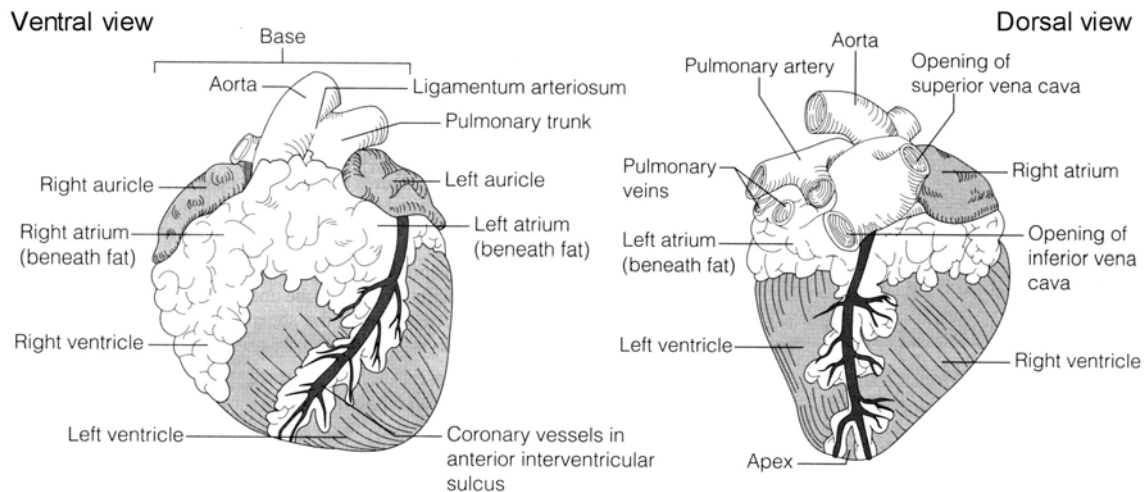
View the glass slide entitled "Heart Muscle intercalated" under the microscope or slide 3 of Viewmaster Set 51 Animal Tissues – Muscle, Bone, Connective Tissue & Nerve.

- Sketch two or three adjacent cardiac muscle cells

- Describe four (4) features of the microscopic structure of cardiac muscle related to
  - shape
  - striated or unstriated
  - number of nuclei
  - nature of junction between cells
- Explain the importance of intercalated discs
- Is cardiac muscle found outside of the heart?

### Sheep heart dissection

The sheep heart is similar in size and structure to the human heart. Dissection allows you to view structures in a way not possible with models and diagrams.



Follow the directions below. Try to locate the **bold** structures and discuss their functions.

- Obtain a preserved sheep heart, dissecting tray and instruments. All students handling the specimen must wear gloves.
- Designate a primary dissector and directions reader. Read the description of each incision and understand it prior to beginning
- The rest of the group should follow along referring to the textbook or lecture notes with details of the structures being studied.

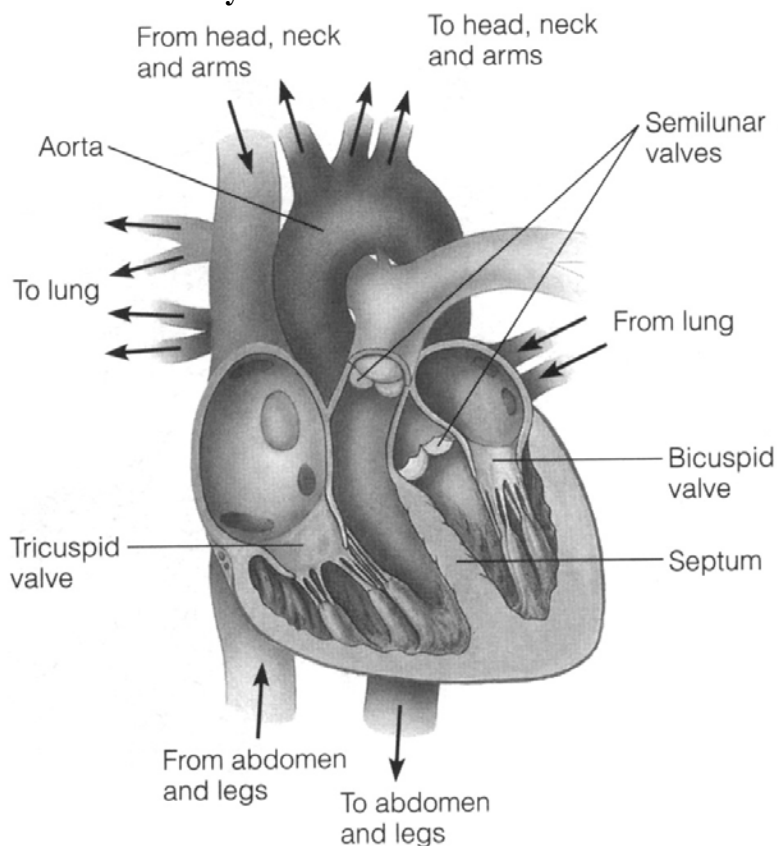
#### External Anatomy

1. The membrane that surrounds and protects the heart is the **pericardium**. Is there a pericardium on your specimen? Y/N
2. Examine the external ventral surface of the heart. (see above) Carefully scrape away some of the fat with a scalpel to expose the **coronary blood vessels**.
3. Identify the **apex** of the heart, and then identify the two wrinkled **auricles**, earlike flaps of tissue projecting from the atrial chambers. The rest of the heart muscle is ventricular tissue. To identify the **left ventricle**, compress the ventricular chambers on each side of the fissures carrying the coronary blood vessels. The

side that feels firmer and thicker is the left ventricle. The **right ventricle** is much thinner and exhibits more “give” when compressed. Hold the heart in its anatomical position and note the left ventricle forming the apex and entire left side of the heart.

4. Try to identify the pulmonary trunk and the aorta leaving the superior aspect of the heart. The **pulmonary trunk** is more anterior, and you may see its division into the right and left pulmonary arteries, if it has not been cut too close to the heart. The thicker walled **aorta** is located just beneath the pulmonary trunk.
5. Cut through the wall of the aorta until you see the **aortic semilunar valve**. Look for the **coronary arteries** branching off the aorta just above the valve. Insert a probe into one of these branches to see if you can follow the course of a coronary artery across the heart.
6. Turn the heart to view its posterior surface. (see dorsal view above) If they are not cut too close to the heart, identify the four thin-walled **pulmonary veins** entering the left atrium. Identify the **superior and inferior vena cavae** entering the right atrium.

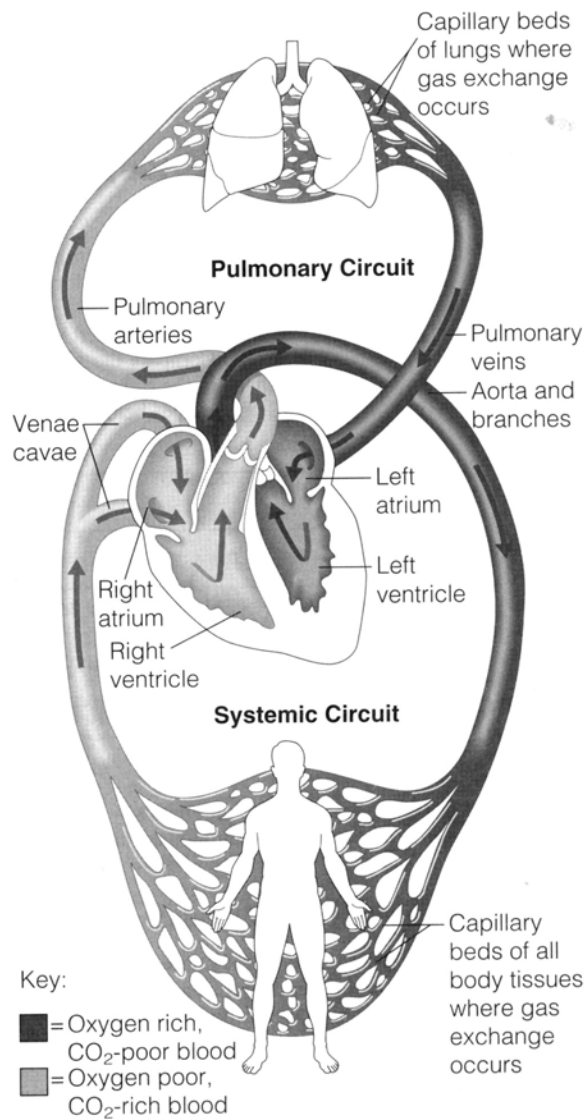
### Internal Anatomy



1. Ask the instructor expose the heart chambers by making cuts with the machete.
2. Lift the heart's anterior wall to observe the two discharging ventricles. Note the difference in the thickness of the **right and left ventricular walls**. The **septum**, a thick wall separates the two sides of the heart. The **right and left atria** are the smaller receiving chambers superior to the ventricles.

3. Thin **tendinous cords** connect the base of the ventricles to the **tricuspid and bicuspid (mitral) atrioventricular valves**. These cords prevent the leaf-like valves from turning inside out thereby preventing backflow of blood into the atria when the ventricles contract.

- The valves located at the origin of the aorta and pulmonary artery are referred to as semilunar valves. With further dissection, attempt to locate the **pulmonary semilunar valve** where the pulmonary artery leaves the right ventricle.



- Find the **aortic semilunar valve** at the exit of the aorta from the left ventricle.
- Follow the **circulatory pathway** of blood in your specimen beginning with the superior and inferior vena cavae and ending at the aorta. Use the blunt probe to follow vessels entering or leaving the heart.

### CLEAN-UP

- Clean your tables** using the Simple Green solution and paper towels while wearing gloves.
- Wash and dry** the dissection instrument kit and dissection tray before returning it to the equipment table.
- Dispose** of dissection materials, paper towels and gloves in the proper receptacles.
- Wash your hands** at the conclusion of the lab.