**Lab: Heart Dissection**

**Mrs. Côté Biology 11**

**Introduction:**

The heart is a fist-sized muscle located to the left of the center of the chest. The heart contains four chambers. The upper chambers called the atria and the lower chambers called the ventricles. Between each chamber, there are valves that prevent the backflow of blood. We use the sheep heart to better understand a human heart as they are very similar in structure.

Blood is carried away from the heart by blood vessels called arteries and carried back toward the heart by blood vessels called veins. Arteries and veins are connected by capillaries. Arteries have muscular, elastic walls to help move the blood through the body. Veins have one-way valves to prevent the backflow of blood on its return to the heart.

Oxygen-poor blood from cells of the body enters the heart through the right atrium and is pumped into the right ventricle. The blood then travels into the pulmonary artery, which goes into the lungs. In the lungs, the blood gives off carbon dioxide and picks up oxygen. The oxygen-rich blood returns to the heart by way of the pulmonary vein.

The blood enters the left atrium and is pumped into the left ventricle. The blood is pumped out of the heart through the aorta to cells in the rest of the body. The muscular wall of the left ventricle is thicker than the wall of the right ventricle because it has to pump the blood to the entire body. Blood leaving the right ventricle only goes to go to the lungs. Each time the ventricles contract, blood is forced through the arteries. This force causes a beat, or pulse, that is felt in arteries at the wrist, neck, and temple. The pulse is the same as the heartbeat, when you feel your pulse you are feeling each time the heart beats and pushes blood through.

**Purpose:**

To properly dissect a sheep heart and identify the structures within the heart and discover the pathway that blood takes throughout the heart.

**Materials:**

The following materials are required: dissecting tray (lined with paper towel), scalpel, blunt probe, scissors, disposable gloves, safety goggles, push pins (16) or (8) toothpicks broken in 1/2, photocopy heart structure tags for labeling (must be cut into individual tags for each structure), sheep heart manual, sheep heart and cell phone (only to be take out at end of lab).

**Procedure:**

1. **Please make sure to have completed the pre-lab work including the pre-lab questions and watching of videos.**
2. **Put on gloves and goggles prior to touching the heart.** Obtain a preserved sheep heart that has been rinsed under water removing as much of the preservative as possible.
3. Pat the heart dry with paper towel before placing it on the paper towel covered dissection tray.

1. Examine the external surface of the heart for adipose tissue (fat), it usually accumulates along the edges of the heart chambers and along the coronary artery (a diagonal line that separates the right and left ventricle).
2. Carefully, remove any excess adipose tissue using the scissors and/or scalpel if any was discovered; however most do not have any.
3. Identify the apex and base of the heart.
4. Locate the various major blood vessels entering and leaving the top of the heart. Identify the following by sifting/pushing the blunt probe through each of the tubes found in the base. **Do not force** the probe. Gently guide the probe to find the path of each vessel. In doing so you should be able to identify the following: superior vena cava, aorta, pulmonary artery(s) and the pulmonary vein(s). Using the blunt probe, insert it into each vessel. Use the dissection manual to assist you in identifying these parts as well. **Use the sheep heart manual to assist you.**
5. Using the scalpel, begin to carefully cut the heart through the ventricle walls beginning at the apex and working your way toward the base of the heart along each side (see figure to right). Make sure to not cut too deep.
* Cut through the entire heart, splitting it in half. It is just like cutting a bagel in half. Always take your time and **don’t** cut too deep.
* The cut should separate the front half of the heart from the back half, **not** the left side from the right side.
* Be sure each cut is short and level. As you cut toward the top, have one partner separate the front and back as the other gently cuts.
* The septum will also have to be cut and separated to allow for easy access of the chambers and valves.

1. The internal structures of the heart should now be exposed. Take a picture of your dissected heart, this will need to be passed in as proof of your essential outcome looking at use of dissection materials.
2. Identify the left and right side of the heart **before** placing any push pins. To do this the left side will have a thicker distance between the wall and the ventricle where the right side will have a thinner distance.
3. Using the dissection manuals as well as your previous knowledge, identify each part of the heart shown on your heart labels sheet by cutting each label out and placing it in the correct location with a push pin or ½ of a toothpick to show the location. You can use both sides of the heart where needed. **Please note that at first you are to only place the essential pins!!**
4. Write all lab partner’s names on a piece of paper towel and place it inside of the dissection tray with the labeled heart. Make sure names are easily read. Take a picture or pictures if necessary of your labeled heart as you will need to hand this in as part of your essential outcome.
5. If you would like to continue for **extension** purposes, please remove all the essential labels and pins and collect the extension labels handout and complete the same process as #11. When you have placed all the labels, take a picture as this will need to be added to your lab report for extension marks. Finish the extension by writing a **proper lab report** and completing the **analysis questions** provided.

**Clean Up Procedure:**

1. Wash and dry dissection tools, and return **dried** tools to their proper bins.
2. Wrap the heart and paper towel in a bundle and dispose of it in the plastic baggie provided. When the plastic baggie becomes full, close it and dispose of it in the dissection room garbage and start a new one.
3. Rinse out the dissection tray and properly place it for drying on the counter of the dissection room. To do this make sure to stack them in opposite directions.
4. Wash goggles in warm, soapy water and place them on the drying rack.
5. **Make sure to spray and wipe down tables.**
6. **Complete proper hygiene by washing your hands.**