

BIO 111 - Laboratory # 3: The Heart

- **Assigned pages:** Mader, S., et al. 2008. Inquiry of Life. pp. 176 (figure 14.2), 190-197, C53-55, and p. 198.
- **Dissection kit, gloves and goggles are required. Please, go get them, if you forgot them.**
- Study information is available at the BioLab website: <http://web.cortland.edu/biolab/111.html>
- **Remember: Quiz #1 is NEXT WEEK - it will cover the GOALS listed for labs 1 through 3**

I. Heart anatomy:

1. GOALS:

Objectives - at the end of laboratory #3 you should be able to:

- 1.) trace the flow of blood through the human heart (We use a calf heart; the flow is the same.);
- 2.) locate and identify the chambers, valves, and major vessels (arteries and veins) of the calf heart;
- 3.) and compare and contrast blood flow through a fetal heart (includes arterial duct) with blood flow through and adult heart

Key terms - you should be able to define:

Right and left atria	Semilunar valves
Right and left ventricles	Right and left atrioventricular valves
Aorta	Cardiac veins & coronary arteries
Superior and inferior vena cavae	Arterial duct
Pulmonary trunk & pulmonary arteries	Umbilical arteries & umbilical vein
Pulmonary veins	Placenta

2. Dissection of the calf heart:

- 1.) **pp. 190 (begin at section 15.2)-193:** Read the introduction and **use** figures 15.3 and 15.4 as guides in the dissection and for your observations
- 2.) Use your probe to **examine the chambers** and be able to **trace blood flow** through these chambers
- 3.) **p. 176:** compare the flow through an adult heart with the flow through a fetal heart (fig. 14.2)
NOTE unique features of fetal heart: oval opening (*foramen ovale*), arterial duct (*ductus arteriosus*), and venous duct (*ductus venosus*).

II. Heart function:

1. GOALS:

Objectives - you should be able to:

- 1.) **understand** the difference between **systolic** and **diastolic** blood pressure
- 2.) **determine** your pulse rate and understand how/why exercise affects it and what is a normal pulse rate for the human adult
- 3.) **understand** how the peaks on an **ECG** correspond to the beating action of the adult heart
- 4.) **understand** how to determine your **blood pressure** using the pulse-rate method and stethoscope methods

Key terms - you should be able to define:

Systole (systolic)	SA node (pacemaker) and AV node
Diastole (diastolic)	Stethoscope method
ECG (also known as an EKG)	Pulse-rate method
P wave, QRS wave, & T wave	Depolarization & repolarization

2. Heartbeat:

- 1.) **pp. 193 (begin at "Conduction System of the Heart")-196:** Read through and stop at section 15.4
- 2.) **follow procedures** for determining heartbeat at rest and after activity, **fill in Tables 15.2 and 15.3 for yourself and your partner and answer the questions**
 - (1.) **MEASURE heartbeat AT REST** using both the pulse-rate and stethoscope methods
 - (2.) **MEASURE heartbeat AFTER ACTIVITY** using pulse-rate method
NOTE: use hallway for exercise.....please.....thanks.....

3. Blood pressure using the MABIS Automatic Wrist Monitor:

- 1.) **pp. 196-197 (section 15.4):** Read and follow the directions listed below, fill in **Tables 15.4 and 15.5**, and answer the questions - take blood pressure **before and after exercise**
- 2.) **Procedure for determining blood pressure using blood pressure monitor:**
 - (1.) you must be in a sitting position with your feet flat on the floor
 - (2.) wrap blood pressure "cuff" around your left wrist so that it is snug but comfortable
NOTE: the LCD display face should be located on the **inside** of your left wrist and your arm slightly raised so that your wrist is level with your heart
 - (3.) Press the START button
 - (4.) REMAIN STILL as the cuff inflates and deflates (it may do this more than once); you'll hear a clicking noise as the cuff deflates
 - (5.) when the air is totally deflated (clicking noise has stopped) the measurement is complete
 - (6.) TWO numbers appear on the LCD, the systolic (SYS) and diastolic (DIA) pressures
 - (7.) **record your numbers** as systolic/diastolic (e.g. 120/80) in **Table 15.4**
 - (8.) **Exercise for one minute**
 - (9.) **REPEAT steps 1 through 7** (above) and **record** your numbers in **Table 15.5**

4. Electrocardiogram:

- 1.) **pp. 193-194:** Review "Conduction System of the Heart" and **Figure 15.5**
- 2.) **pp. C53-C55:** Read the descriptions of heart contraction and the ECG (physiograph)
- 3.) **observe** the ECG demonstration
- 4.) **p. 194:** Answer the questions under "Observation: Nodes"