

BIO 111 - Laboratory # 4:**Circulation - The Cardiovascular System and the Hepatic Portal System**

- **Assigned pages:** Mader, S., et al. 2008. *Inquiry of Life*. pp. 173-184, p. 186 (Review), pp. 188-89, p. 198
- (Review), p. 213, p. 230 (Review), p. 219 and pp. C57-59
- **Further observations** of internal fetal pig anatomy; **study** of prepared slides of blood cells
 - ✓ **Dissection kit, gloves and goggles are required (please, go get them if you forgot them)**
 - ✓ Photos, study aids & all handouts available at: <http://web.cortland.edu/biolab/111.html>

I. Blood and the Cardiovascular System:**1. GOALS:****Objectives - you should be able to:**

- 1.) describe the flow of blood through the systemic circuit and pulmonary circuit (adult & fetus)
- 2.) locate the major veins and arteries of the **thoracic cavity** and state "where they come from and where they go"
- 3.) locate the major veins and arteries of the **abdominal cavity** and state "where they come from and where they go"

Key terms - you should be able to define:

Thoracic Arteries (Fig. 14.5)	Thoracic Veins (Fig. 14.6)	Abdominal Arteries (Fig. 14.7)	Abdominal Veins (Fig. 14.8)	Blood Cells (Fig. 15.1)
aorta (arch, anterior)	anterior/posterior vena cava	dorsal aorta (cont'd from thorax)	posterior vena cava	erythrocyte (red blood cells)
brachiocephalic artery/trunk	right/left <i>external</i> juglar veins	celiac artery (anterior to kidneys)	hepatic (portal) vein	leukocytes (white blood cells)
right/left subclavian arteries	Right/left <i>internal</i> juglar veins	anterior mesenteric artery	right/left renal veins	platelets (<i>not</i> cells & much smaller)
right/left carotid arteries	right/left subclavian veins	right/left renal arteries	right/left <i>common</i> iliac veins	
pulmonary trunk	right brachio-cephalic vein	right/left iliac arteries	umbilical vein	
dorsal aorta		umbilical artery		

2. Path of Blood Flow in the Adult & Fetus - PLEASE, DO NOT REMOVE ORGANS

- 1.) **pp. 173-178** (partly, a review): **read** sections 14.1 and 14.2 and **answer** the questions (pp. 175, 177, 178), if not done last week
- 2.) **pp. 177-178 (pulmonary circuit):** read, and follow directions for locating the pulmonary trunk and Arteries

3. Thoracic Cavity - Major Arteries and Veins - PLEASE, DO NOT REMOVE ORGANS

- 1.) **pp. 178-181 (section 14.3, Systemic Circuit):** **read** and **use figures 14.4-14.6** to locate the major veins and arteries of the thorax (listed under "key terms", above)
NOTE: Use care when cutting away tissue/membranes behind heart covering the arteries & veins
- 2.) **Know** where the blood is coming from and going to; **answer** questions on p. 180

4. Abdominal Cavity - Major Arteries and Veins - PLEASE, DO NOT REMOVE ORGANS

- 1.) **pp. 182-184 (section 14.3, cont'd, Systemic Circuit):** **read** and **use figures 14.4, 14.7-14.8** to locate the major veins and arteries of the abdomen (listed under "key terms" above)
NOTE: Use care if you need to cut away the membranes to view the renal arteries & veins and common iliac veins and arteries
- 2.) **Know** where the blood is coming from and going to; **review** the questions on p. 175
- 3.) **Use** the diagrams on **p. C-57** (fetal pig arteries) and **p. C-59** (fetal pig veins) to check locations and to **quiz yourself and your lab partner**
- 4.) **p. 186:** Review - **answer** questions 5-12, and 17

5. Overall Review - In lab or/and on your own time:

- 1.) ☺ **pp. 212-213** (subsection "Observation: Cardiovascular System in Pigs"): **answer** the questions for "The Heart" (p. 212) and "Blood Vessels" (p.213); **this is a good way to learn** "where the blood comes from and where it goes" and **review for the practical!**

6. Blood Cells (section 15.1)

- 1.) **pp. 188-189**: read subsection on "red and white blood cells"
- 2.) **Use** the prepared slides on the demonstration scopes to observe the various blood cell types
- 3.) **p. 188**: **Fill in Table 15.1** with your observations
- 4.) **p. 198, Review**: **answer** questions 1-5, 9, and 16

II. Hepatic Portal System:

1. GOALS:

Objectives - you should be able to:

- 1.) explain the function of the hepatic portal system and how blood flows through it
- 2.) know the location and function of the **hepatic veins**

Key terms - you should be able to define:

hepatic portal system (remember this circulation goes through the liver, see figure 17.3 - b, p. 219)

hepatic portal vein (in the region of the bile duct where it empties out of the gall bladder, see Fig. 17.3)

umbilical vein (leading to the liver, you cut this vein during lab 2 during the abdominal dissection)

venous duct (a branch of the posterior vena cava and main channel through the liver, see Fig 14.8)

2. Organs of the Hepatic Portal System:

- 1.) **p. 213** (subsection "Hepatic Portal System and Associated Vessels"): read the directions for locating the organs of this system (you have seen these before when we identified the organs in the abdominal cavity)
- 2.) **p. 219 (figure 17.3-c)**: use this figure to locate the hepatic portal vein; read the caption summarizing liver function
- 3.) **p. 230, Review**: **answer** questions 4 and 7.