LAB 1

Blood and Blood Vessels

Assignments:

**Due before lab:**
Complete the charts and definitions on pages 2 and 3 before coming to lab and be prepared for a quiz.

Label the figures on pages 9 and 11 - before coming to lab. Use both your textbook and lab website.

Do the case study on page 12.

**Due next lab:**
Quiz over heart anatomy (pgs. 14-15) and ECG waves (pg. 21)

Objectives:
Identify the following blood cells: erythrocytes, neutrophils, eosinophils, basophils, lymphocytes, monocytes. Describe their function and know normal blood values.

Determine unknown blood types. Know what antigens and antibodies are present for a particular blood type.

Define leukocytosis, leukopenia, polycythemia, anemia

Identify cervical and thoracic thymus, and spleen on the fetal pig.

Identify the arteries and veins on the fetal pig that are listed in your lab manual.

Identify the arteries and veins on the human model that are listed in the lab manual.

Our BIO 139 Lab website is:

http://www.bluegrass.kctcs.edu/natural_sciences/biology/bio_139_virtual_lab/
**Slides - Demo**  
Know type, function and frequency  
(Never let monkeys eat bananas)

Complete the table below before coming to class!

<table>
<thead>
<tr>
<th>Blood cell</th>
<th>Identification (Characteristics)</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythrocyte</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutrophil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basophil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eosinophil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lymphocyte</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monocyte</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
B. **Blood Typing**

Be able to determine blood type from sample and be familiar with terms: **antigens, antibodies, agglutinogens, agglutinins**

<table>
<thead>
<tr>
<th>Blood Type</th>
<th>Antigen</th>
<th>Antibody</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XXXXXXXXX</td>
<td>XXXXXXXX</td>
<td>XXXXXX</td>
</tr>
<tr>
<td>Rh +</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rh -</td>
<td></td>
<td><strong>Anti-Rh</strong></td>
</tr>
</tbody>
</table>

*** only when stimulated to produce them under certain conditions.

C. **Red and White Blood Cell Counts**

Know normal values and define terms listed below:

Normal values- Human

- WBC: 4-11,000/mm$^3$
- RBC: 4-6 million/mm$^3$

**Define terms:**

- leukocytosis
- leukopenia
- polycythemia
- anemia
SIMULATED ABO AND RH BLOOD TYPING KIT

Materials:

Unknown simulated blood samples for:

	Mr. Smith
	Ms. Jones
	Mr. Green
	Ms. Brown

Simulated typing serum:

	Anti-A
	Anti-B
	Anti-Rh

Procedure:

Each group of two students will determine the blood type of one of the four unknown blood samples.

1. Place 3-4 drops of your unknown simulated blood sample in the A, B and Rh wells.
2. Place 3-4 drops of the simulated anti-serums in the appropriate well (i.e. 3-4 drops of simulated anti-A serum in the A well).
3. Use separate tooth picks to stir each sample of serum and blood. A positive test is indicated by a strong agglutination reaction. Record your observations and the observations of the class in the chart below.

Data Table:

<table>
<thead>
<tr>
<th>Reactions</th>
<th>Anti-A Serum</th>
<th>Anti-B Serum</th>
<th>Anti-Rh Serum</th>
<th>Blood Type</th>
<th>Antigens present</th>
<th>Antibodies present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Smith</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ms. Jones</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Mr. Green</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Ms. Brown</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### D. Fetal Pig Anatomy - lymphatic system and blood vessels

**Identify:** Spleen

**Blood Vessels:**

<table>
<thead>
<tr>
<th>Arteries</th>
<th>Veins</th>
</tr>
</thead>
<tbody>
<tr>
<td>left subclavian</td>
<td>right external jugular</td>
</tr>
<tr>
<td>right subclavian</td>
<td>left external jugular</td>
</tr>
<tr>
<td>right common carotid</td>
<td>right internal jugular</td>
</tr>
<tr>
<td>left common carotid</td>
<td>left internal jugular</td>
</tr>
<tr>
<td>brachiocephalic</td>
<td>brachiocephalic</td>
</tr>
<tr>
<td>aorta or aortic arch</td>
<td>superior (anterior)vena cava</td>
</tr>
<tr>
<td>abdominal aorta</td>
<td>inferior (posterior)vena cava</td>
</tr>
<tr>
<td>right renal</td>
<td>right renal</td>
</tr>
<tr>
<td>left renal</td>
<td>left renal</td>
</tr>
<tr>
<td>*right umbilical</td>
<td>*left umbilical</td>
</tr>
<tr>
<td>*left umbilical</td>
<td>*umbilical vein (not visible on page 7)</td>
</tr>
<tr>
<td>pulmonary trunk</td>
<td></td>
</tr>
<tr>
<td>femoral</td>
<td></td>
</tr>
</tbody>
</table>
Veins of the fetal pig

- Right External Jugular
- Right Internal Jugular
- Left External Jugular
- Left Internal Jugular
- Brachiocephalic
- Superior Vena Cava

Inferior Vena Cava

Renal

Note: Umbilical Vein is not visible
E. **Blood Vessel Models**  See pictures in text and website. Be able to identify arteries and veins on models.

**ARTERIES - BLOOD VESSEL MODEL**

12. Vertebral
18. Common carotid
18a. Internal carotid
19. Arch of aorta
20. Aorta
16. Subclavian
21. Axillary
24. Brachial
29. Ulnar
32. Radial
44. Dorsal metacarpal arteries
48. Pulmonary Trunk
68. Abdominal aorta
6_. Renal artery (red vessel below renal vein – 64)
72. Common iliac
73. External iliac
75. Internal iliac
78. Femoral
80. Popliteal
82. Anterior tibial
81. Posterior tibial
83. Dorsalis pedis
Labeling Exercise

Using your textbook and the lab website, label all the arteries listed on pg. 8
VEINS - BLOOD VESSEL MODEL

10. Jugular
17. Superior vena cava
  1. Brachiocephalic
16. Subclavian

21. Axillary
22. Cephalic
24. Brachial
27. Basilic

35. Superficial palmar arch
63. Inferior vena cava
64. Renal vein
72. Common iliac

73. External iliac
75. Internal iliac
91. Small saphenous
99. Great saphenous

ALTAY NECK MODEL  (new)

12  Trachea
13  Thyroid Gland

14  Lt. Common Carotid Artery
15  Lt. Internal Jugular Vein
16  Rt. External Jugular Vein

17  Lt. Subclavian Artery
21  Superior Vena Cava
Labeling Exercise

Using your textbook and the lab website, label all the veins listed on pg 10.
F. **During open lab hours, view the CD Rom on Blood and Immune system.**

   This is a good review for lecture.

G. **Case Study** *(not to turn in)*

   A 23-year BCTC student was in a one-car accident and was badly cut on the arms and neck. A passing state trooper stopped to investigate the accident and pulled the victim from his overturned car. He noted pulsatile bleeding from a wound on the victim’s left arm and a steady flow of blood from a wound in the neck.

   Of the two major bleeding sites, which one was more serious and why?

   The damaged vessel in the left arm was:

   The damaged vessel in the neck was:

   In the patient’s vascular system where would velocity of blood flow be slowest? Fastest?

   In what part of the vascular system is most of the blood located?