**STUDY GUIDE BLOOD AND LYMPH VESSELS**

**VOCABULARY**

Endothelium Artery Vein

Capillary Lymphatic Lymph

Arteriole Heart Elastic artery

Muscular artery Venule Tunica intima

Tunica media Tunica adventia Precapillary sphincter

Endothelial cell Valve Fenestration

Microvascular Portal

**OBJECTIVES AND QUESTIONS**

1. How are blood vessels classified? (Hint: size, structure, function). What are the three primary layers of vascular walls and what are they composed of? Which layer is found in all vessels? (Hint: tunica intima). What layers are present in capillaries? In arteries? In veins? Understand the structure/function relationship of the components of vessels. (Example: smooth muscle and elastic fibers control wall stress but these interfere with nutrient exchange; the lack of thereof makes the veins easily distensible so they can serve as a blood reservoir and capillaries suited for nutrient exchange).
2. Be able to trace blood flow from the heart through tissue and back to the heart realizing that there are two systems (i.e., pulmonary and systemic). What are the functions of each component? (Hint: heart – the pump, arteries – efferent vessels, capillaries – nutrient exchange vessels, veins – afferent vessels). Note that in the systemic circulation, arteries carry oxygenated blood, whereas in the pulmonary circulation arteries carry deoxygenated blood; therefore arteries = away, but not necessarily oxygenated blood).
3. Which components of the CV system are important in maintaining blood pressure? (Hint: heart, elastic and muscular arteries). Which are capacitance AKA reservoir, vessels? (Hint: veins). Which are resistance vessels? (Hint: arterioles). How do arterioles control circulation through microvasculature? (Hint: autoregulation – smooth muscle contraction resists pressure when need for flow is low and relax when need for flow is high.
4. What are the three types of capillaries based on structure of the endothelial cell wall and how do they differ in structure and location? How does a portal system differ from a common capillary bed, for example in muscle? What is the consequence/function of a Microvascular (AV) shunt?
5. Where are blood barriers found and what are their functions?
6. What are the functions of lymphatics? What controls lymph flow? (Hint: compression by surrounding tissue, anchoring devices keep vessels open, unidirectional flow controlled by valves). What is the relative rate of lymph flow? (Hint: rapid). Do the same mechanisms that control blood pressure affect lymph pressure? (Hint: not really; systemic hypertension would increase lymph production but pressure would not go up until venous pressure rises leading to edema, obstructed lymphatics would also cause edema.