Study Guide – Exam 4

34) Actual gas exchange occurs through the walls of which type of vessel?

capillaries

35) Describe how humans inhale and exhale air (i.e., the processes of inhalation and

exhalation).

inhalation: diafram contract

36) List the disadvantages of using water as a respiratory medium (versus air)?

37) Explain the role of hemoglobin in gas exchange. Include two important functions of

hemoglobin in addition to its primary function. Be sure to describe the processes by

which hemoglobin binds to oxygen at the lungs and then releases the oxygen at body

tissues and organs.

38) Why would you want a respiratory surface that is moist and with a lot of surface area?

39) How does countercurrent exchange optimize gas exchange across fish gills?

40) Where does gas exchange specifically occur in mammalian lungs, and how does it occur

(describe the process)?

1) Know the following terms: neutrophil, antibody, pancreas, monocyte, agglutination,

neutralization, macrophage, antigen, epitope, collecting duct, urethra, renal pelvis, ureter,

renal vein, kidney, integration, dendrite, astrocyte, axon, reception, synapse, transmission

(as it applies to nervous systems), hormone, tropic hormone, nontropic hormone

2) What substances do the parietal and chief cells of the stomach’s lining secrete into the

lumen? What do these substances do after they are released into the lumen of the

stomach? Why are these substances not secreted by the same cell?

3) What occurs in the duodenum of the small intestine?

4) Describe the structure of an . What is an antibody composed of? Antibodies

are also known as \_\_\_\_\_\_\_\_\_\_\_ (fill in the blank).

5) Which organ of the human digestive tract produces bile? What is the purpose of bile in

the digestive system?

6) Where does digestion of carbohydrates begin in the digestive system? Where does

protein digestion begin?

7) What is the function of the epiglottis?

8) What is the function of the gallbladder?

9) What are the primary functions of the small intestine? Describe the “brush border” of

the small intestine. Describe how nutrients are absorbed by the small intestine.

10) What is the main function of the large intestine?

11) Explain how the pancreas serves as both an exocrine and endocrine organ.

12) List and describe the many non-specific defenses of your immune system (include

aspects of both your first and second lines of defense).

13) What are the key differences between innate immunity and adaptive (acquired)

immunity?

14) Antibody-mediated immunity and cell mediated immunity are the two types of

adaptive immunity. How is antibody-mediated immunity different from cell-mediated

immunity?

15) Why are helper T cells crucially important to the functioning of your immune system?

because T cells attack and kill foreign or infected cells, or cancer cells

16) What is immunological memory, and why is it important? How does the secondary

response to an antigen differ from the primary response?

immunological memory basically allows the immune system to maintain a record of know anthogen binding sites so the T Cells can readily respond to a threat posed to the whole system. This means that the threat can be neutralized immediately before it can cause any harm.

The secondary response is much more direct and effective while the primary response is a general response to figure out what to do with the current thread.

17) How are B-cell receptors different from T-cell receptors?

B-cells produce antibodies that bind to antigens.

T cells attack and kill foreign or infected cells, or cancer cells.

18) Describe two kinds of passive immunity.

19) What is the glomerulus, and what is its function in mammals?

20) What is an osmoconformer? Provide an example.

Osmoconformers are marine animals which, in contrast to osmoregulators, maintains the osmolarity of their body fluids such that it is always equal to the surrounding seawater.

Examples of osmoconformers are the elasmobranchs - marine cartilaginous fish - such as sharks, rays and skates.

21) What is an osmoregulator? Provide an example.

Osmoregulation is the active regulation of the osmotic pressure of an organism's fluids to maintain the homeostasis of the organism's water content.

Example is freshwater fish.

22) What is the main form of nitrogenous waste released by mammals to their environment?

Fishes? Birds and reptiles?

23) What are nephrons? List the major parts of a nephron, and describe the function of each

part.

24) What is the function of a Schwann cell? Why are these cells important in your nervous

system?

Schwann cells or neurolemmocytes are the principal glia of the peripheral nervous system (PNS). Glial cells are so important because they function to support neurons and in the PNS, also include satellite cells, olfactory ensheathing cells, enteric glia and glia that reside at sensory nerve endings, such as the Pacinian corpuscle.

25) Differentiate between interneurons, afferent neurons, and efferent neurons. Describe

the primary role (or function) of each.

26) A motor neuron is a special type of \_\_\_\_\_\_\_\_\_ that innervates \_\_\_\_\_\_\_\_\_\_ (fill in the

blanks).

motor neuron a.k.a. efferent neuron, primary neuron, or alpha motor neurons carry signals from the spinal cord to the muscles to produce movement

27) What is an action potential? What occurs during the depolarization of an axon? What is the refractory period? How does the action potential (or impulse) propagate down an axon?

28) Know the following systems and their basic functions:

a. Central Nervous System (CNS)

b. Peripheral Nervous System (PNS)

c. Somatic System

d. Autonomic System and its Sympathetic and Parasympathetic divisions.

29) Know the major parts of the adult human brain and their basic functions.

30) Describe the general structure of a neuron.

31) Describe the basic model of a neuronal circuit and how it works (i.e., basic model of neural signaling).

32) What is the primary function of a nervous system? In other words, why do we have a nervous system?

33) Describe the two types of synapses. By which synapse do the majority of vertebrate neurons communicate?

34) What is saltatory conduction?

35) Describe the four types of cell signaling in the endocrine system?

36) Provide an example of each of the following types of hormones (or local regulator): 1) amine hormone, 2) peptide hormone, 3) steroid hormone, and 4) fatty acid-derived molecules. Which ones are primarily hydrophilic? Which ones tend to be hydrophobic? Why can hydrophobic hormones enter their target cells and bind to internal receptors?

37) List the major endocrine cells and glands of humans and the hormones that they produce.

38) Learn all of the hormones that I mentioned in class and know their basic functions (flash cards might be useful here).

39) Why is an iodine deficiency in someone’s diet harmful to their thyroid gland (including its function)?

40) What causes Type-I and Type-II diabetes?

41) What is the proposed function of melatonin in humans?