

Examinations

Microanatomy Final Exam, Part B, 25 points

December 14, 2000 / Dr. Provo-Klimek

Analysis

In front of every question is the number of students who missed that question. For questions that were highly missed, a breakdown of the particular wrong answer chosen is included. The average on this part of the final exam was 19/25, or 75.9%. The median was 19, and the mode was 20.

Define the following terms, 4 points:

1. **(63 missed)** Leukemia (from PBL session on 11-16-00): abnormal proliferation of hematopoietic cells and encompasses both lympho- and myeloproliferative disorders.
2. **(36 missed)** Polychromasia (from blood lecture): Polychromasia is variation in the hemoglobin concentration of the erythrocytes in circulating blood

Circulatory System, 5 points:

3. **(38 missed)** A fenestrated capillary is one that
 - a. **(11 chose this)** has a discontinuous basement membrane.
 - b. **(25 chose this)** has gaps between the endothelial cells.
 - c. **has pores within the endothelial cells.**
 - d. **(2 chose this)** has arteriovenous anastomoses.
 - e. None of the above.
4. **(10 missed)** Which of the following is a correct description of the structure of a muscular artery?
 - a. **Tunica intima has internal elastic lamina; tunica media > 5 cell layers thick; tunica adventitia is loose connective tissue.**
 - b. No internal elastic lamina; tunica media > 5 cell layers thick; tunica adventitia absent.
 - c. Tunica intima has internal elastic lamina; tunica media < 3 cell layers thick; tunica adventitia is loose connective tissue.
 - d. No internal elastic lamina; tunica media contains layers of elastin; tunica adventitia is loose connective tissue.
 - e. None of the above matches the description of a muscular artery.
5. **(13 missed)** Which of the following is true regarding the comparison of the structure of an arteriole with that of a comparably sized venule?
 - a. The arteriole will have all three layers (intima, media and adventitia) while the venule will not have adventitia.
 - b. **The layers of the venule will be thinner and the muscle may be discontinuous.**
 - c. The venule will not have the tunica intima, but all of the other layers are present; the vessel wall is thicker in the venule than the arteriole.
 - d. The tunica adventitia is absent in the arteriole but present in the venule.

6. **(10 missed)** An insufficiency of lymph drainage can lead to fluid accumulation in the interstitial tissue. This fluid accumulation is referred to as _____.
- ascites
 - thrombosis
 - coagulation
 - edema**
 - stasis
7. **(11 missed)** Capillaries
- are approximately 13 μm in diameter.
 - can accommodate the passage of only one red blood cell at a time.
 - are composed of endothelium and basement membrane only.
 - have one layer of smooth muscle.
 - b and c**
 - All of the above.

Blood and Hemopoiesis, 10 points:

8. **(33 missed)** Which of the following values would be within the range of normal for the number of circulating neutrophils in a dog?
- 1,000,000 neutrophils/ μl of blood
 - 100,000 neutrophils / μl of blood
 - 10,000 neutrophils / μl of blood**
 - 1,000 neutrophils / μl of blood
 - None of the above.
9. **(7 missed)** Neutrophils adhere to the vessel walls before migrating into the tissues; these adhered cells compose the _____ pool
- phagocytic
 - coagulating
 - regenerating
 - left shift
 - marginating**
10. **(50 missed)** Which of the following is the best explanation of the meaning of the term “mean corpuscular volume” (MCV)?
- The average size of a red blood cell.**
 - (14 chose)** The average hematocrit over time.
 - (4 chose)** It is the same as packed cell volume.
 - (23 chose)** The volume of cells per unit of blood.
 - (10 chose)** None of the above is correct.
11. **(63 missed)** Which of the following is the best description of the function of an eosinophil?
- (3 chose)** First line of defense against invading microorganisms.
 - Is attracted to antigen-antibody reactions to phagocytize debris.**
 - (2 chose)** Involved in the immune system; can differentiate to produce antibodies.
 - (29 chose)** Degranulates in response to antigen-antibody reactions to cause vasodilation.
 - (1 chose)** Differentiates to macrophage for tissue defense.
 - (21 chose)** a and d

12. (7 missed) Which of the following is **not** a protein found in blood:
- alpha globulin
 - keratin**
 - fibrinogen
 - a and b
 - b and c
 - None of the above.
13. (12 missed) Hemolytic anemia is a condition in which there is premature lysis (rupture) of the red blood cells. When you look at a blood smear from a patient with this condition, you often see red blood cells of various abnormal shapes. The term used to describe this situation is __.
- anisocytosis
 - poikilocytosis**
 - polychromasia
 - leptocytosis
 - acanthocytosis
14. (15 missed) Which of the following cell types can circulate in the peripheral blood in small numbers in a normal animal?
- band neutrophils**
 - myelocytes
 - metamyelocytes
 - prorubricytes
 - rubricytes
15. (10 missed) Immature red blood cells can be released by the bone marrow in response to anemia; in this situation, the anemia is said to be “regenerative”. The cells released first are the reticulocytes. Which of the following is true of the reticulocytes that would be present on a smear of blood from such an animal?
- Reticulocytes are larger than mature red blood cells.
 - Reticulocytes have lower hemoglobin concentration than mature red blood cells.
 - Reticulocytes have residual ribosomes in their cytoplasm.
 - All of the above are true.**
 - None of the above is true.
16. (7 missed) In ruminants and birds the most numerous white blood cell is the
- neutrophil
 - lymphocyte**
 - basophil
 - eosinophil
 - monocyte
17. (39 missed) You suspect your sick canine patient has pyometra (infection of the uterus), and to determine if there are relatively more neutrophils in circulation, you perform a differential count. Which of the following is not true regarding characteristics that will help you distinguish between neutrophils and eosinophils in her blood smear?
- (11 chose) A neutrophil nucleus is more heterochromatic than an eosinophil.
 - (9 chose) Eosinophils are generally larger than neutrophils.
 - (3 chose) An eosinophil nucleus is less constricted than a neutrophil nucleus.
 - (3 chose) Eosinophils contain visible granules and neutrophil granules are hard or

- impossible to visualize.
- e. **(11 chose)** All of the above are untrue.
 - f. ***All of the above are true.***

Integument, 6 points:

18. **(36 missed)** Which of the following is true regarding Langerhan cells of the skin?
- a. **(4 chose)** They may be found in the dermis and in the epidermis; they have a clear cytoplasm and are difficult to distinguish from melanocytes.
 - b. **(12 chose)** They are antigen-presenting cells derived from bone marrow precursors.
 - c. **(2 chose)** They are specialized touch receptors derived from neural crest.
 - d. ***a and b are true.***
 - e. **(18 chose)** a and c are true.
19. **(43 missed)** Which of the following is not true regarding a hair follicle?
- a. **(18 chose)** Sebaceous glands found with hair open into and are derived from the hair follicles.
 - b. **(2 chose)** The glassy membrane separates the external root sheath from the surrounding connective tissue.
 - c. **(2 chose)** The bulb of the hair rests on a dermal papilla.
 - d. **(22 chose)** Both the hair and the follicle have a cuticle layer.
 - e. ***All of the above are true.***
 - f. None of the above is true.
20. **(20 missed)** Formation of tubular horn in the hoof is analogous to the formation of a hair because:
- a. a papilla from the corium (dermis) is covered by dividing cells of the epidermis of the hoof.
 - b. the corium (dermis) is the source of the blood and nerve supply for the dividing cells.
 - c. the tubular horn is composed of keratinized cells, as is the hair.
 - d. ***All of the above are correct.***
 - e. None of the above is correct.
21. **(26 missed)** The granules of the stratum granulosum of the skin are:
- a. phagosomes
 - b. lysosomes
 - c. melanin
 - d. ***keratohyaline***
 - e. artifact
22. **(18 missed)** In which of the following places would you expect to find myoepithelial cells?
- a. Deep to the epithelium of the male reproductive tract.
 - b. Attached to hair follicles.
 - c. In the lactiferous sinus.
 - d. Surrounding ducts of anal glands.
 - e. ***Surrounding alveoli of the mammary gland.***
23. **(8 missed)** In the diagram of a sagittal section of the horse's foot below, letter "A" is pointing to an area of the hoof that would contain which of the following three-dimensional structures:

- a. papillae
- b. laminae**
- c. I don't know.
- d. I don't care.
- e. I'll worry about it next semester.

(Hint: it is either "a" or "b".)

