

Sample PBL Exercise

Microscopic Anatomy PBL Worksheet: blood and hemopoiesis

Nov. 16, 2000

1. Understanding the prefixes, suffixes, and roots of medical terms will help you understand and remember the meaning of the words you encounter in your present and future learning. Working with your neighbors, use your medical dictionary and determine both the word origins and the contextual meanings for each of the following words or phrases related to cytology and bone. You may have to break a word/phrase up into several parts to discover its derivation.

a. coagulopathy

Derivation: _____

Contextual meaning: _____

b. hemolysis

Derivation: _____

Contextual meaning: _____

c. mean corpuscular volume (MCV)

Derivation: _____

Contextual meaning: _____

d. nonregenerative anemia

Derivation: _____

Contextual meaning: _____

e. erythron

Derivation: _____

Contextual meaning: _____

f. hemostasis

Derivation: _____

Contextual meaning: _____

Application Questions:

2. From Robinson's "Current Therapy in Equine Medicine 4", 1997, p. 283: [Anemia of chronic disease] is well recognized in mammalian species, and is characterized by a mild to moderate, nonregenerative, normochromic, normocytic anemia."
- a. Based on the above description, what can you say about the size and staining of the red blood cells that would be present on a slide made from an animal suffering from anemia of chronic disease (ACD)?

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- b. Based on your knowledge to date and the description above, discuss what you think is abnormal in the erythron of an animal suffering from ACD. (Hint, if the anemia is “normochromic” and “normocytic”, what else could be wrong to call the condition “anemia”?)
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3. From Robinson’s “Current Therapy in Equine Medicine 4”, 1997, pp. 285-286: “In healthy horses, the platelet count ranges from 1×10^5 to $6 \times 10^5/\mu\text{l}$. A platelet count of less than 100,000/ μl constitutes thrombocytopenia. Several mechanisms exist: (1) decreased or ineffective production; (2) sequestration of platelets in the reticuloendothelial organs, the spleen and liver; and (3) increased loss, use or consumption of platelets. Horses with tumors of the vascular tissues such as hemangioma and hemangiosarcoma ... may be thrombocytopenic due to excessive coagulation. ... Signs specific to thrombocytopenia include petechial and ecchymotic hemorrhages on oral and nasal mucous membranes, sclera, third eyelid, vulva, and occasionally inside the ear. Epistaxis, melena, hyphema, and hematuria also occur. ... Spontaneous hemorrhage is rare unless the platelet count is less than 10,000 to 20,000/ μl .”

a. What is “sequestration”?

b. Why do you think that vascular tissue tumors can result in excessive coagulation?

c. What are “petechial and ecchymotic hemorrhages”?

4. From Robinson’s “Current Therapy in Equine Medicine 4”, 1997, p. 295: “Leukemia is the abnormal proliferation of hematopoietic cells and encompasses both lympho- and myeloproliferative disorders. ... Leukemia can be classified based on (1) the type of abnormal cell: lymphoid or myeloid; (2) the degree of tumor differentiation: acute or chronic; and (3) the number of abnormal cells circulating in the peripheral blood: aleukemic; subleukemic, leukemic.”

a. What is the difference between lympho- and myeloproliferative disorders?

b. If an animal develops a granulocytic leukemia, what do you think happens to the numbers of other blood cells in circulation? (Hint: tumors are space-occupying lesions...)
