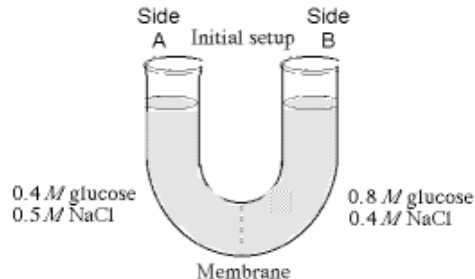


## AP Biology – Unit 3 Study Guide

1. How do phospholipids move in the fluid-mosaic model of the cell membrane?
2. What are the membrane structures that function in active transport?
3. What is the net movement of uncharged molecules from low concentration to high?
4. What is the voltage across membranes called?
5. What does the movement of potassium into or out of the cell require?
6. What are the functions of membrane proteins?
- 7-8. Explain what would happen regarding osmosis in the following scenario?



9. What substances move through lipid bilayers easily?
10. Ions diffuse across membranes down what gradients?
- 11-14. Be able to interpret a graph of percent mass change versus time for 5 unknown dialysis tube bags
15. What does a cell use exocytosis for?
16. What does cholesterol in the plasma membrane in animals do?
17. Two similar-sized animal cells are placed in a 0.5% sucrose solution. Cell A enlarges in size for a while, then stops. Cell B ruptures. What was true at the beginning of the experiment?
- 18-22. Label the structures of the fluid-mosaic model.
23. What would a cell lacking oligosaccharides be inefficient in?
24. Is diffusion and active or passive transport?
25. What are the properties of the sodium-potassium pump?
26. What kind of molecules would not be found in the cell membrane?
27. What would occur if guard cells surrounding epidermal cells in a plant are deficient in potassium ions?
28. How do stomata open?
29. What is responsible for the cohesion of water?
30. The water within xylem vessels moves toward the top of a tree because of what phenomena?
31. What is the water potential (psi) of pure water?
32. Calculate psi from psiS and psiP
33. What would happen if you put a root with a water potential of  $-0.15\text{MPa}$  in a 0.1M solution of sucrose?
34. What does the pressure-flow hypothesis of phloem transport state?
35. What factors are involved in the movement of water through a terrestrial plant?
36. What kind of day would result in the fastest delivery of water and minerals to leaves of a tree?
37. What is the Casparian strip in plant roots used for, and where is it located in the tissue?
38. Water flows into the source end of a sieve tube because...
39. What causes the pressure in the pressure-flow hypothesis of translocation?
40. What part of the plant (or soil) should have the lowest (most negative) water potential?
41. What are the properties of xylem, and what does it do?
42. Where do air-breathing insects carry out gas exchange?
43. How do gills operate?
44. What features do all gas exchange systems have in common?
45. Why is gas exchange more difficult for aquatic animals than it is for terrestrial animals?
46. A red blood cell is in an artery in the left arm of a human. How many capillary beds must this cell pass through before it is returned to the left ventricle of the heart?
47. Most of the carbon dioxide carried by the blood in humans is carried as....
48. What is the reason why fluid is forced out of systemic capillaries at the arteriole end?
49. Trace the path of a molecule of  $\text{CO}_2$  released into the blood in your left toe travels out of your nose.
50. What are the properties and functions of the hemoglobin molecule?

51. What does a BP of 110/80 mean?
  52. In which vertebrates does blood flow directly from respiratory organs to body tissues without first returning to the heart?
  53. In what organisms are tracheal systems for gas exchange found?
  54. Human plasma proteins include what molecules?
  55. The phenomenon that increases the gas exchange efficiency of fish gills is the...
  - 56-58. Explain what structures of the heart carry out what function.
  59. What respiratory surfaces in the animals kingdom are associated with capillary beds?
  60. What occurs with the exhalation of air from human lungs?
  61. Be able to identify examples of countercurrent exchange?
  62. Where is the velocity of blood flow is lowest?
  63. Why does air rush into the lungs during inspiration?
  
  64. What form of nitrogenous waste requires hardly any water?
  65. A biologist discovers a new species adapted to living in a deep cavern that provides no source of free water. The organism is eyeless and covered by fur, and it has a four-chambered heart with a closed circulatory system. What excretory system modifications might the biologist expect to find?
  66. What mechanisms would account for increased urine production as a result of drinking beer?
  67. What causes the transfer of fluid from the glomerulus to the Bowman's capsule?
  68. In addition to their role in gas exchange, fish gills are also directly involved in what processes?
  69. Which part of the vertebrate nephron consists of capillaries?
  70. Where is urea produced?
  71. The digestion and utilization of which nutrient creates the greatest need for osmoregulation by the kidneys?
  72. Be able to pair mechanism for osmoregulation/nitrogen removal with the appropriate organism that utilizes it.
  73. What is the advantage of excreting wastes as urea rather than ammonia?
  74. How does the internal environment of most marine invertebrates compare to the sea water around them?
  75. What organisms have Malpighian tubules?
  76. What is the main nitrogenous waste excreted by birds?
  77. What organisms have protonephridia?
  78. Three groups: One drinks pure water, another beer, and the third, a solution that is isotonic to blood. At the end of the study, which group will have produced the most urine?
  79. Proper functioning of the human kidney requires considerable active transport of sodium in the kidney tubules. If these active transport mechanisms were to stop completely, how would urine production be affected?
- Use a diagram of a nephron to answer the following:
80. Where does filtration occur?
  81. In which region would urine become more concentrated?
  82. Where would K and Na be reabsorbed by the blood?