

STUDY GUIDE -- Membranes and Transport

Answers to Problems:

1. If you placed a cell containing 20% solutes in a solution of 10% dissolved solutes, which direction would you expect the water to move (into or out of the cell)?

Net movement into the cell

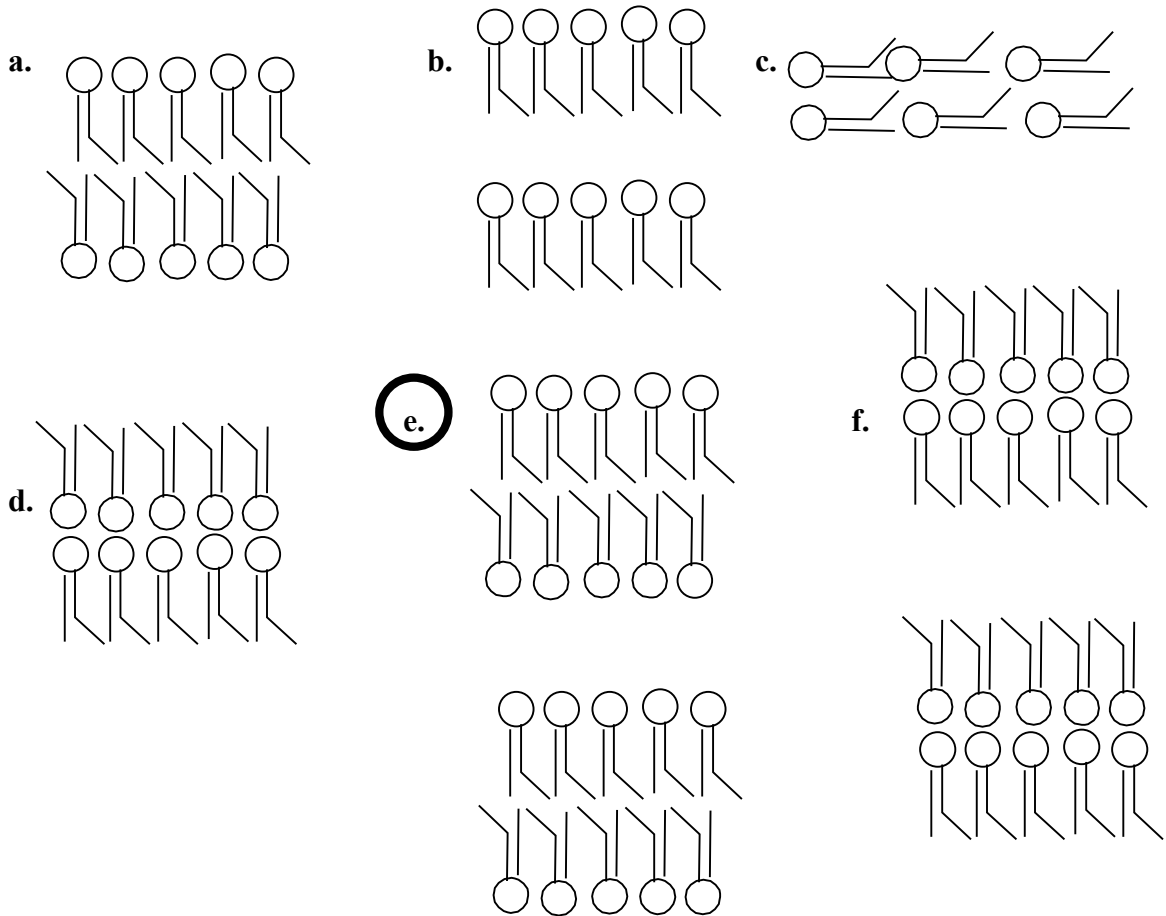
Is the cell hypertonic, isotonic or hypotonic compared to the surrounding solution? *The cell is hypertonic compared to the surroundings.*

What would be the solute concentration of a solution that is hypertonic to this cell? *solution with a solute concentration greater than 20%*

Isotonic to this cell? *solution with a solute concentration of exactly 20%*

Hypotonic to this cell? *solution with a solute concentration less than 20%*

2. Which of the following is representative of the phospholipid arrangement in the nuclear envelope?



The nuclear envelope is a **double** membrane. Only diagram "e" shows two such phospholipids bilayers in the appropriate orientation.

How does this structural arrangement compare to the membranes of the mitochondria and chloroplasts? *The same since all are enclosed in double membranes. The cell (plasma) membrane is like "a."*

3. You fill a dialysis bag with a solution containing 1% starch and place it into a beaker containing a solution of 5% albumin, 10% sucrose, 15% sodium chloride. The dialysis membrane is **impermeable** to starch and albumin and **permeable** to all the other molecules.

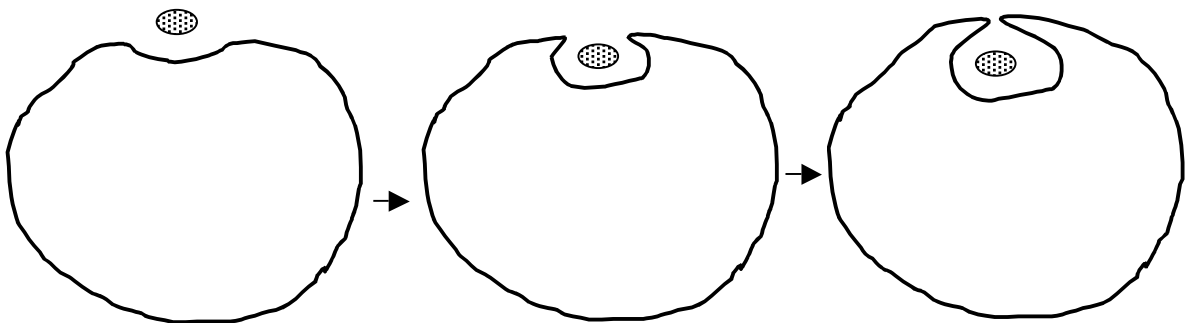
Which molecules would cross the membrane and which direction would they move (into or out of the bag)? *sucrose and NaCl would move into the bag; water would move out of the bag*

Which direction (into or out of the bag) would water move? *water would move out of the bag*

4. Glucose is a polar molecule. Suppose you place a cell containing 1% glucose in a solution of 5% glucose. By what process would glucose be transported INTO this cell? What must be present in order for this process to occur?

Facilitated diffusion; an intrinsic membrane protein specific to glucose must be present

5. What cellular process is diagrammed below (be complete and specific)?



Endocytosis, specifically phagocytosis