Jonathan Quang 10/27/14

Biology

Prelab #6

Part A:  
1. Particles in a fluid exhibit random motion.  
2. The concentration of the particles diffusing into the cell increases until the point where both concentrations are equal.  
3. During the time that the particles are diffusing into the cell a point is eventually reached where an equal amount of particles are passing into and out of the cell.  
4. True/False: Diffusion continues to occur until there is an equal concentration of particles on both sides of a semi-permeable membrane. True  
5. True/False: Diffusion is the spontaneous net movement of particles from an area of low concentration to an area of higher concentration. False

Part B:  
1. Osmosis is best defined as the movement of water molecules across a membrane from an area of high water concentration to an area of lower concentration.  
2.Small nonpolar molecules will pass through a cell membrane the easiest.  
3.A red blood cell placed in a hypertonic solution will shrink or shrivel.  
3a (check attached separate piece of paper)  
4. True/False: A 5% urea solution is hypotonic to a 10% urea solution: True  
5. True/False: If a cell is placed in an isotonic medium, there will be no net movement of water: False

Part C:  
1. Water, oxygen, and carbon dioxide should be able to diffuse in and out of plant cells, leaf cells in particular.  
2. Water should be able to diffuse into cells because it is necessary in photosynthesis. Oxygen is a byproduct of photosynthesis. There is a greater concentration of oxygen inside a cell, so it diffuses out. Carbon dioxide is needed in the Calvin Cycle of photosynthesis. Carbon dioxide would be needed to diffuse into the cell.  
3. When a healthy plant cell is placed in a highly concentrated salt solution, one could hypothesize that its cell wall, cell membrane, and cell cytoplasm would shrink and recede. Water concentration is higher in the plant cell than in the hypertonic concentrated salt solution. Water would leave the cell's central vacuole, decreasing turgor pressure. The cell cytoplasm would lose the pressure, causing it to recede and shrink as it also loses water. The cell membrane would recede from the water loss as well. This loss of pressure also causes the plant cell wall to shrivel.

Part D:  
1.Dialysis tubing is a type of tubing that acts as a semi-permeable membrane. It is made up of a modified version of cellulose, such as cellulose acetate.   
2. Substances indie the cell would diffuse outwards because there is a greater concentration of glucose and starch inside the cell. The indicator solution would end up in the cell because there is none of it in the cell.  
3.With this type of model, one would expect simple passive transport because there is no energy being used to transport molecules against their concentration gradient, making it passive transport. There is also no transport or channel proteins involved, so this is just regular simple diffusion.  
4. Heat the glucose and glucose indicator solution in separate test tubes. If both tubes do not change color, then it is the combination of the two that achieves the change in color.   
5. The model cell should be rinsed off before being placed in the beaker because some of the solution could have ended up on the outside of the model cell while pouring in the solutions or mixing them.  
6. The chemical identified as Glucose Indicator is actually Benedict's solution (a form of iodine). It works by changing color in the presence of glucose or other reducing sugars. It generally (not all the time), changes from clear blue to a red color in the presence of the previously mentioned molecules.  
7. The chemical identified as Starch Indicator is actually iodine, water, and potassium iodide mixed together. The combination of the three forms a linear chain of three ions, which when slipped into a spiral of a starch molecules, the molecules show an intense black-blue color.  
8. Red onion cells are used instead of white onion cells because the white onion cell parts are harder to see under the microscope as they may appear almost clear like. Red onion cells have at least a red tint.  
9.To create a slide using red onion cells and a coverslip, numerous steps must be taken. First, take the provided small, curved section of a onion and break its middle. The second step is to gently peel off the reddish outer membrane. The third step is to position the membrane in a drop of water on a slide while making sure the membrane does not fold in on itself. A coverslip should be added to the slide by gently putting it on from one side of the slip to the next.  
10.To add a solution to the slide without disturbing the coverslip or the cells, a paper towel should be placed against one edge of the cover slip. Then several drops of the solution should be added to the other side. The paper towel will soak up the liquid already on the slide and draw the solution to it. Then, remove the paper towel before it soaks up too much liquid and dries out the other side.