Understanding Cell Membranes

**Parts of a Cell Membrane**

Identify the parts of a cell membrane by putting the appropriate letters on the blanks.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>protein</td>
<td>C</td>
</tr>
<tr>
<td>B</td>
<td>phospholipid</td>
<td>D</td>
</tr>
</tbody>
</table>

![Cell membrane diagram]

**Concentration Gradients**

For gradient A, make the line into an arrow to show the direction a particle would move if it were moving to where the concentration is lower. For gradient B, make it show the direction the particle would move if it were moving to where the concentration is higher.

**Diffusion**

Figure 1 shows a container divided by a barrier. The left side contains particles of gas A; the right side, particles of gas B. Figure 2 shows the same container after the barrier has been removed. Use these figures to answer the questions below.

1. Which direction did particles of gas A move when the barrier was lifted?  
   right or left

2. Which direction did particles of gas B move when the barrier was lifted?  
   right or left

3. Would increasing the temperature increase the rate of movement of the particles?  
   yes or no

4. Were the particles in Figure 1 moving before the barrier was lifted?  
   yes or no

5. Were the particles in Figure 1 diffusing before the barrier was lifted?  
   yes or no

6. Are the particles in Figure 2 still moving?  
   yes or no
Diffusion of Particles through a Membrane

In the figures below, each $O_2$ represents one oxygen molecule. The structures in the pictures are cell membranes. Circle the correct answer for each of the questions.

1. What type of movement do the oxygen molecules demonstrate? diffusion or exocytosis
2. What type of transport do the oxygen molecules demonstrate? active or passive
3. If the molecules were water, what would we call the movement? endocytosis or osmosis
4. Which figure has the greatest concentration of oxygen molecules inside the cell? figure 1 or figure 2
5. Which figure has the least concentration of oxygen molecules outside the cell? figure 1 or figure 2

Diffusion of Particles through a Membrane (Part 2)

Each beaker and cell contains 100 ml of water. The cell membranes are permeable to the particles in the water. Note: the closeness of the dots represents the concentration of particles on each side of the membrane.

1. For line #1, determine whether the particles would diffuse “in” or “out” of the cell. Use “in” or “out” for your answers.
2. For line 2, write “hypertonic” or “hypotonic” on the lines to describe the solution in the beaker. None are isotonic.

Questions (refer to beakers A – C above; use the beaker letters as the answers)

1. Which cell appears to have the greatest particle concentration? 
2. Which cell appears to have the least particle concentration? 
3. Which solution (beaker) appears to have the least particle concentration?
Osmotic Solutions

Write the word "hypertonic", "hypotonic", or "isotonic" on the appropriate line to indicate the type of solution in the beaker.

Note: arrows show water entering and leaving red blood cells

Osmosis through a Membrane

Each beaker and cell contains 100 ml of water. The cell membranes are permeable to the water but not the particles. Note: the closeness of the dots represents the concentration of particles on each side of the membrane.

1. For line #1, determine whether the water would diffuse "in" or "out" of the cell. Use "in" or "out" for your answers.
2. For line 2, write "hypertonic" or "hypotonic" on the lines to describe the solution in the beaker. None are isotonic.

Questions

Refer to beakers A. – C. above to answer the following questions. Use the letters of the beakers as your answers.

1. Which cell appears to have the greatest water concentration? ______
2. Which cell appears to have the least water concentration? ______
3. Which solution (beaker) appears to have the greatest water concentration? ______
Osmosis through a Membrane (Part 2)

Write hypertonic, hypotonic, or isotonic on the lines depending on what type of solution is in the beaker. Assuming that the water can diffuse, change the lines into arrows to show which way the water would move by osmosis.

A. ___________________                B. ___________________               C. ___________________

Circle the appropriate answer for each of the following questions.

1. A 0.9% salt solution is isotonic to red blood cells.
   A. What would happen if red blood cells were placed in a 0.7% salt solution?       swell up    or    shrivel
   B. What would happen if red blood cells were placed in a 1.0% salt solution?       swell up    or    shrivel

2. What structure keeps plant cells from bursting in a hypotonic solution?    cell wall    or    cell membrane

3. What would happen to plants cells in a hypertonic solution? pop open (cytolysis) or wilt (plasmolysis)

4. Which beaker and bag is in dynamic equilibrium?          A    or    B    or    C

5. Which statement best describes what happens to the motion of molecules in dynamic equilibrium.
   the molecules continue to move    or    the concentration continues to change

6. Turgor pressure in plant cells causes:   the cell to burst    or    the membrane to press against the cell wall

Active Transport (the picture shows a potassium ion going out of a cell – steps 1 to 4)

1. Is the potassium ion moving with or against its concentration gradient? ____________________________

2. What is the large oval substance that is helping the potassium ion get out of the cell? _____________

3. Is this an example of active or passive transport? ______________________________