**THE CELL MEMBRANE: So Important it Gets its Own Section in the Notes**

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| The cell membrane is a \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ that surrounds eukaryotic and prokaryotic cells.  C:\Users\lawrimore.cassie\Desktop\PL bilayer.JPG | Job  Description: | 1. It forms a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ between a cell and the outside environment  2. It controls the \_\_\_\_\_\_\_\_\_\_\_\_ of materials \_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_ a cell. | | Characteristics: | | The cell membrane is made up of a \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ of molecules called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mixed in with a variety of other molecules. | | The cell membrane is fluid and \_\_\_\_\_\_\_\_\_\_.  The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ molecules can move around in a fluid-like manner. |
|  | **The Parts of the Cell Membrane** | | | | | | |  |
| **Phospholipids** are composed of 3 basic parts:  1. a charged \_\_\_\_\_\_\_\_\_\_\_\_ head  2. a \_\_\_\_\_\_\_\_\_\_\_\_ molecule  3. two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ chains/tails | The \_\_\_\_\_\_\_\_heads of the phospholipids are attracted to  the polar water molecules \_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_  of the cell. | | | | *The Cell Membrane isn’t only made*  *of phospholipids though- it has other molecules embedded in the phospholipid bilayer.* | | | |
|  | The phospholipid heads line up and form the \_\_\_\_\_\_\_\_  surfaces of the  cell membrane.  The fatty acid tails are \_\_\_\_\_\_\_\_\_\_\_ and cannot form bonds with water. | |  | | **Protein molecules:**  Embedded in the cell membrane and help flow \_\_\_\_ and \_\_\_\_ of the cell.    **Cholesterol molecules:**  \_\_\_\_\_\_\_\_\_\_\_\_\_ and keep the cell membrane \_\_\_\_\_\_\_\_.  **Carbohydrates:**  Attached to membrane proteins; help cells to \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_. | |  | |
| Because the phosphate head has a slight charge,  phospholipids are \_\_\_\_\_\_\_\_ molecules.  Non-polar tails are attracted to each other and \_\_\_\_\_\_\_\_\_ by water. | | | | |

**Cell Transport: How the Cell Membrane Moves**

**Materials Into and Out of the Cell**

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| The cell membranes is  \_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_  This means that it allows  some, but not all  \_\_\_\_\_\_\_\_\_\_\_  to pass through it. | | The cell must be able to control the  in and out movement of  certain molecules and ions  **Selective permeability** allows the  cell to maintain \_\_\_\_\_\_\_\_\_\_\_\_  in the event that the  environment \_\_\_\_\_\_\_\_\_\_  \_\_\_\_ \_\_\_\_\_ changes. | |  | | |
| **Substances Pass Through the Cell Membrane in Different Ways** | | | | | | |
| Some of these methods require the cell to \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ and some do not. | **Passive Transport** is the  Movement of molecules across the cell membrane \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ input from the cell.  **Three types:** | | | | |
| Factors that determine how something moves across the membrane:  1. \_\_\_\_\_\_ of the molecule  2. \_\_\_\_\_\_\_\_\_\_\_ of the molecule  3. \_\_\_\_\_\_\_\_\_\_\_\_ of the molecule inside and outside of the cell. | **Diffusion**  Is the movement of molecules iin a fluid or gas from a region of \_\_\_\_\_\_\_ concentration to a region of \_\_\_\_\_\_\_\_\_ concentration    OR    Difference in concentration in one area compared to another=  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Diffusion moves down the concentration gradient | | **Osmosis**  Osmosis is the \_\_\_\_\_\_\_\_\_\_\_\_\_of \_\_\_\_\_\_\_across a semi-permeable membrane from an area of higher water concentration to an area of lower water concentration.  The higher the concentration of \_\_\_\_\_\_\_\_\_\_in a solution, the lower the concentration of \_\_\_\_\_\_\_\_\_\_in the same solution.    Osmosis/Diffusion continues until the concentration reaches **equilibrium**. | | **Facilitated Diffusion**  The diffusion of molecules across the membrane through transport proteins.    This happens because some molecules cannot easily diffuse across the \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | |
|  | 2 kinds of proteins involved in facilitated diffusion:  \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_  **http://bio1151b.nicerweb.net/Locked/media/ch07/07_15FacilitatedDiffusionB.jpgCarrier proteins** grab a molecule, change shape, and spin around like a revolving door.  **Channel proteins** create a \_\_\_\_\_\_\_\_\_\_  through  which  molecules  can pass. |
| **Concentration** is the number of molecules of a substance in a given volume.    Circle the glass of water with the highest concentration of salt in it. |

**Cell Membrane Continued**

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| Some substances cannot get into or out of the cell membrane by \_\_\_\_\_\_\_\_\_\_\_\_  transport. | **The cell has three ways to handle these substances.**  **They are…** | | | |
|  | **Active Transport**  Happens when a cell uses \_\_\_\_\_\_\_\_\_\_ to transport molecules from a region of\_\_\_\_\_\_\_  concentration to \_\_\_\_\_\_\_\_\_\_  concentration.  Performed by thousands of transport protein “\_\_\_\_\_\_\_\_” embedded in the cell’s \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_.  Transfer protein pumps are positioned across the membrane so one part is on the inside of the cell and one part is on the outside.    Example: this happens in \_\_\_\_\_\_\_\_\_\_\_ (nerve cells). The membrane proteins are constantly pumping ions in and out of the cell so they can send messages to the body from the brain. | **Endocytosis**  The process of taking in large molecules into the cell by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_  in a membrane and forming a vesicle.  In order for a cell to transport very large \_\_\_\_\_\_\_\_\_\_\_\_\_\_ or a large substance in vesicles, it costs the cell energy.  http://www.google.com/url?source=imgres&ct=img&q=http://www.psc.edu/science/2007/bardomain.html/images/endocytosis.jpg&sa=X&ei=2L3RTL7UBcT38AbnvPyyDA&ved=0CAQQ8wc&usg=AFQjCNGD2_PR6qHzwwkhdSAOBYy-zc0DvA  Endocytosis Process:  1. the membrane forms a \_\_\_\_\_\_\_\_\_\_\_ around the substance.  2. pocket breaks off and forms a \_\_\_\_\_\_\_\_\_\_\_\_.  3. The vesicle then fuses with a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  4. The lysosome \_\_\_\_\_\_\_\_\_ the vesicle and the contents.  Two types  **Pinocytosis**= “cell drinking”  **Phagocytosis**= “cell eating” | **Exocytosis**  The \_\_\_\_\_\_\_\_\_\_\_\_ of substances out of a cell by the \_\_\_\_\_\_\_\_\_\_\_\_ of a vesicle with a membrane.    Exocytosis Process:  1. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_forms around materials to be sent out of the cell.  2. The vesicle fuses to the \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  3. The cell membrane opens to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the cell and releases its contents.  **Vocab Corner**  Hydro- water  Phobic- afraid/hate  Philic-loves  Cyt- cell  Phago- eating  Pino- drinking  Exo- outside  Endo- inside  Facilitate- to help |
| In other words, the cell has to work AGAINST the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_; below is what that would look like with a semipermeable membrane.    It COSTS energy (ATP) to go AGAINST the concentrations gradient. |

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| Our cells are bathed in solutions and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  of solutes in and out of the cell can cause the cell to \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_. | **Types of Solutions** | | |
| Salt is a \_\_\_\_\_\_\_\_\_\_\_\_. | **Isotonic**  A solution is isotonic if there is the \_\_\_\_\_\_\_\_ amount of \_\_\_\_\_\_\_\_\_\_\_ inside the cell as in the solution. | **Hypertonic**  A solution is hypertonic if it has a \_\_\_\_\_\_\_\_\_\_\_\_\_ concentration of solute than the cell does. | **Hypotonic**  A solution is hypotonic has a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ concentration of solute than inside the cell. |
| SALT SUCKS  When it is concentrated inside or outside of the cell, it will draw the \_\_\_\_\_\_\_\_\_\_ in its direction.  This is why you get thirsty after eating something salty.  Cell \_\_\_\_\_\_\_\_\_\_\_\_\_  Depends on balancing water uptake and loss.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | If a cell is in an \_\_\_\_\_\_\_\_\_\_\_\_\_ solution, water molecules will move in and out of a cell at an \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_. | If a cell is in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solution, water will flow \_\_\_\_\_\_\_ of the cell, causing it to \_\_\_\_\_\_\_\_\_\_ (shrivel) or die | If a cell is in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solution, water will diffuse  (osmose) into the cell. If too much water enters the cell, it could \_\_\_\_\_\_\_\_ (burst). |
| The cell’s \_\_\_\_\_\_\_\_\_\_  will not change. | The cell will shrink. | The cell will swell. |
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| In this case, the cell is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the solution. | In this case, the cell is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the solution. | In this case, the cell is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the solution. |