Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Unit 3 Topic 3

Period: \_\_\_\_\_\_\_ Page: \_\_\_\_\_\_

**Cell Membrane Coloring & Application**

***Composition of the Cell Membrane & Functions:***

The cell membrane is also called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ membrane and is made of a phospholipid \_\_\_\_\_\_\_\_\_\_\_\_\_. The phospholipids have a hydrophilic (water attracting) \_\_\_\_\_\_\_\_\_\_\_\_ and two hydrophobic (water repelling) \_\_\_\_\_\_\_\_\_\_\_\_\_\_. ***SKETCH AND LABEL*** a phospholipid coloring the heads red and the tails blue.

PHOSPHOLIPID:

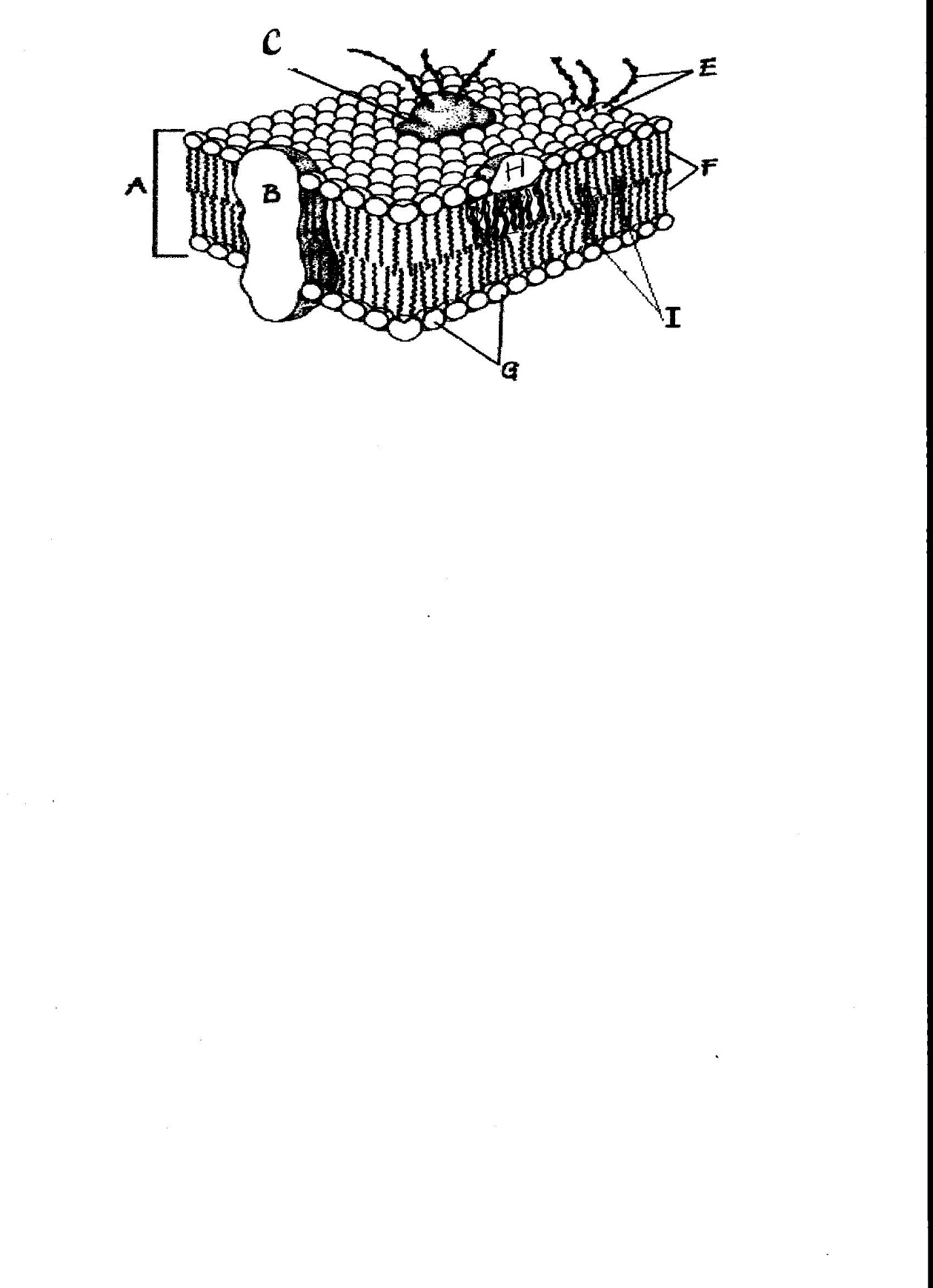
Another type of lipid in the cell membrane is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that strengthens. Embedded in the phospholipid bilayer are proteins that aid in diffusion and in cell recognition. Proteins called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ proteins go all the way through the bilayer and recognize and assist medium to large and polar molecules passing through the membrane. Some of the membrane proteins have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ attached to help cells in recognize each other and certain molecules; these molecules are called glycoproteins.

List the functions of each of the following macromolecules in the cell membrane:

|  |  |
| --- | --- |
| a. | Carbohydrate:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| b. | Protein:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| c. | Lipid:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

Correctly ***color code and identify*** the name for each part of the cell membrane.

|  |  |  |  |
| --- | --- | --- | --- |
| **Letter** | **Name/Color** | **Letter** | **Name/Color** |
| \_\_\_\_\_ | Phospholipid bilayer (no color) | \_\_\_\_\_ | Phosphate heads (yellow) |
| \_\_\_\_\_ | Protein (pink) | \_\_\_\_\_ | Cholesterol (blue) |
| \_\_\_\_\_ | Fatty acid tails (orange) | \_\_\_\_\_ | Glycoprotein (Carbohydrate) (green) |

***Match*** the cell membrane structure or its function with the correct letter from the diagram above.

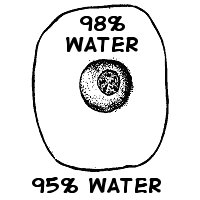
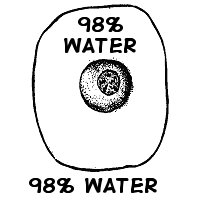
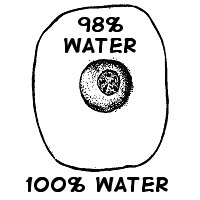
|  |  |
| --- | --- |
| Letter | Structure/Function |
| \_\_\_\_\_ | Attracts water |
| \_\_\_\_\_ | Helps maintain strength of membrane |
| \_\_\_\_\_ | Involved in cell-to-cell recognition |
| \_\_\_\_\_ | Repels water |
| \_\_\_\_\_ | Make up the bilayer |
| \_\_\_\_\_ | Help transport certain materials across the cell membrane |
|  |  |

***Osmosis and Tonicity***

1. Define osmosis. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. In which direction does water move across membranes, up or down the concentration gradient? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Define these 3 terms:

|  |  |
| --- | --- |
| a. isotonic- | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| b. hypertonic | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| c. hypotonic | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

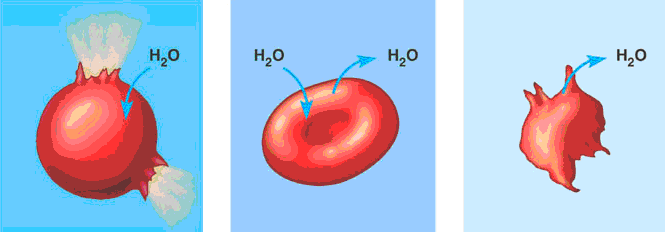
***Use arrows*** to show the direction of water movement into or out of each cell. ***Color and label*** the cell in an isotonic environment light blue, the hypotonic environment yellow, and the hypertonic environment light green.

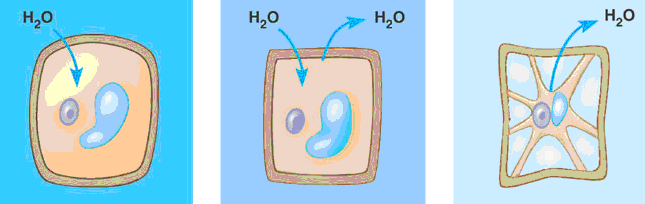
***Match the description or picture with the osmotic condition:***

|  |  |
| --- | --- |
| ***A. Isotonic*** | **\_\_\_\_\_ solution with a lower solute concentration** |
|  | **\_\_\_\_\_ solution in which the solute concentration is the same** |
| ***B. Hypertonic*** | **\_\_\_\_\_ condition plant cells require** |
|  | **\_\_\_\_\_ condition that animal cells require** |
| ***C. Hypotonic*** | **\_\_\_\_\_ red blood cell bursts (cytolysis)** |
|  | **\_\_\_\_\_ plant cell loses turgor pressure (Plasmolysis)** |
|  | **\_\_\_\_\_ solution with a higher solute concentration** |
|  | **\_\_\_\_\_ plant cell with good turgor pressure** |
|  | **\_\_\_\_\_ solution with a high water concentration** |

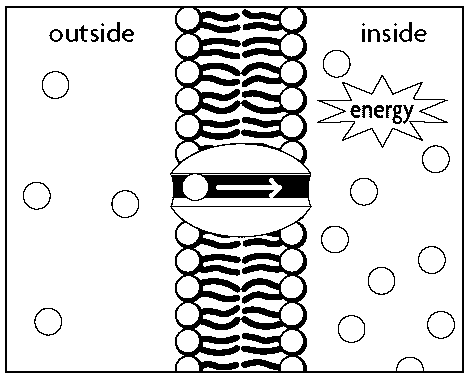
***Label the tonicity for each solution (isotonic, hypotonic, or hypertonic):***

******

***\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_***

******

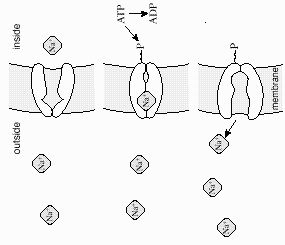
***\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_***



***Transport Requiring Energy***

1. What type of transport is represented by the picture to the right? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. In which direction (concentration gradient), is the movement occurring? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Color*** the internal environment of the cell yellow. ***Color and Label*** the transport proteins red and the substance being moved blue.

One type of active transport is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pump which helps muscle cells contract. This pump uses \_\_\_\_\_\_\_\_\_\_\_ to move ions \_\_\_\_\_\_\_\_ the concentration gradient.

The protein that is used to pump the ions through is called a \_\_\_\_\_\_\_\_\_\_\_\_ protein and it changes its shape to move the ions across the cell membrane. ***Label and color*** the carrier proteins red and the ions green.