

Cell Membrane

Name _____ Date _____ Per _____

Read the description of the cell membrane and use the pictures of the individual components to draw and label a cell membrane.

Overview

The cell membrane is a structure responsible for being the barrier between the outside environment and the inside components of a cell. In addition to creating a wall between the outside of a cell and the inside of a cell, the membrane must also be the threshold in which certain molecules can enter and exit the cell when necessary. In general, the cell membrane keeps the cell components separated from organisms and cells on the outside and it defines the cell.

What is the Phospholipid Bilayer?

This **phospholipid bilayer** is a part of all cell membranes. The barrier that determines a cell's boundary is the role of this layer. This layer is actually two layers of fat cells that are organized as two sheets. Every *phospholipid* molecule contains a *hydrophobic tail region*, and a *hydrophilic head region*. The hydrophobic layer is repelled from aqueous water conditions while the hydrophilic region is attracted to them. The hydrophobic tails orient themselves toward the inside of the bilayer.

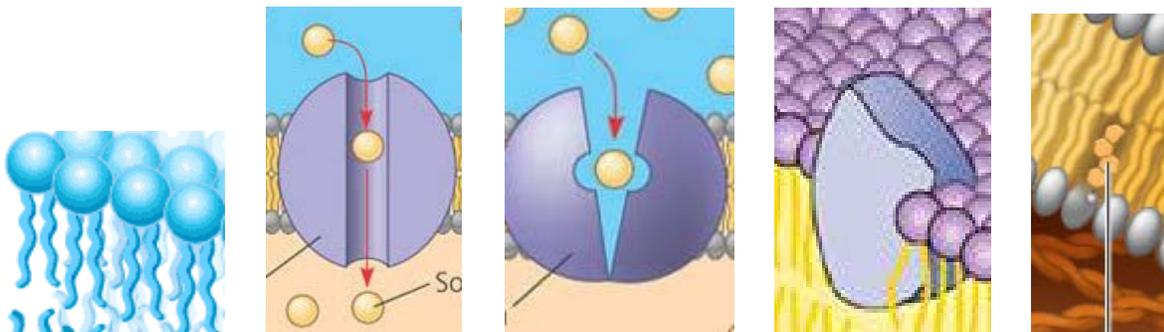
Only gases can pass easily through the bilayer. Other molecules cannot pass through without other structures, proteins, assisting them. The membrane also contains **cholesterol** molecules that fit nicely into the hydrophobic region of the bilayer that gives the cell fluidity or flexibility.

What Structures are Responsible for Membrane Transport?

While a cell membrane must be selective in what it allows to pass through it, certain large molecules must be able to be moved across their membranes, such as amino acids, nucleotides, and sugars. Because of this, this membrane must have specific structures that allow certain molecules to be transported.

Transporting proteins involve **transmembrane proteins** that span the entire membrane and act as transporters. The two primary transport protein classes include **channel proteins** and **carrier proteins**. These proteins are crucial to cell interactions and cell life. Cell membranes may also contain **integral proteins** that do not span the entire membrane, but are attached to either the inside or outside of the cell and are involved in chemical signaling. Some cells have just a few proteins, while other cells may have hundreds of these proteins in their membrane. They make it possible for molecules and ions to be properly distributed in multicellular organisms.

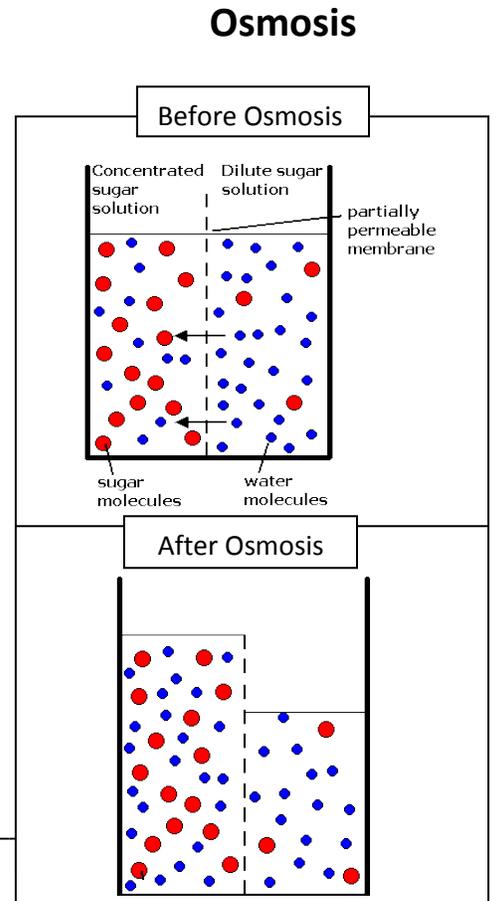
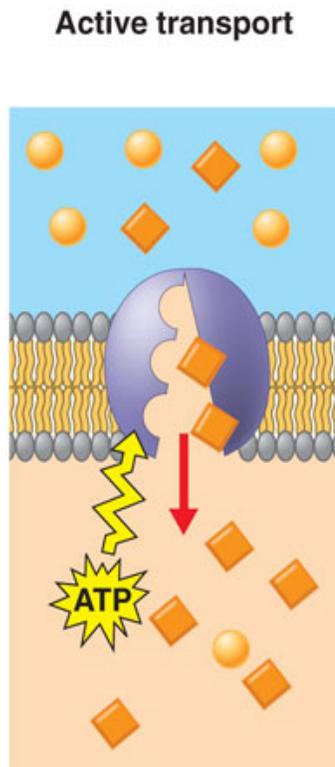
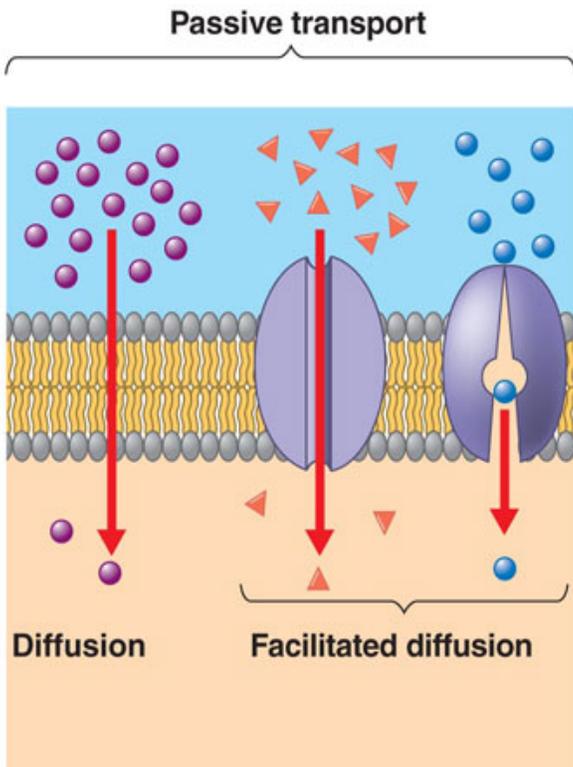
Draw and label your cell membrane below using the following components (components may be used once or numerous times):



Cell Transport

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Instructions: Write a sentence to describe each type of cell transport depicted in the pictures below. Use the following questions to guide your thinking: 1. What direction is movement occurring relative to concentration? 2. Does the membrane require a helper (protein) to move the substance? 3. Does it require energy (ATP)?



Diffusion: _____

Facilitated Diffusion: _____

Active Transport: _____

Osmosis: _____