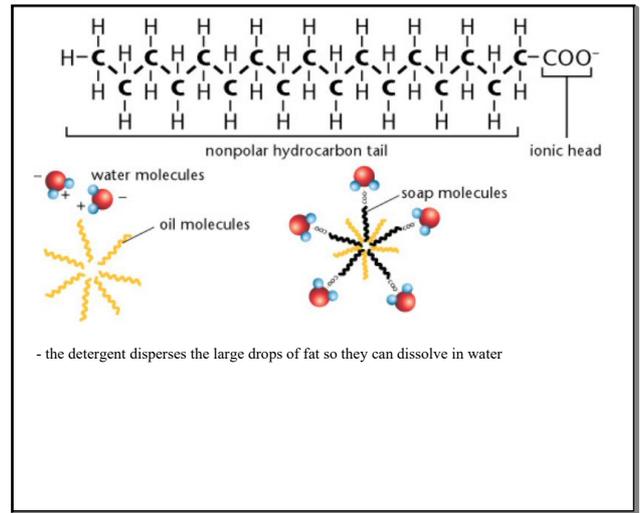


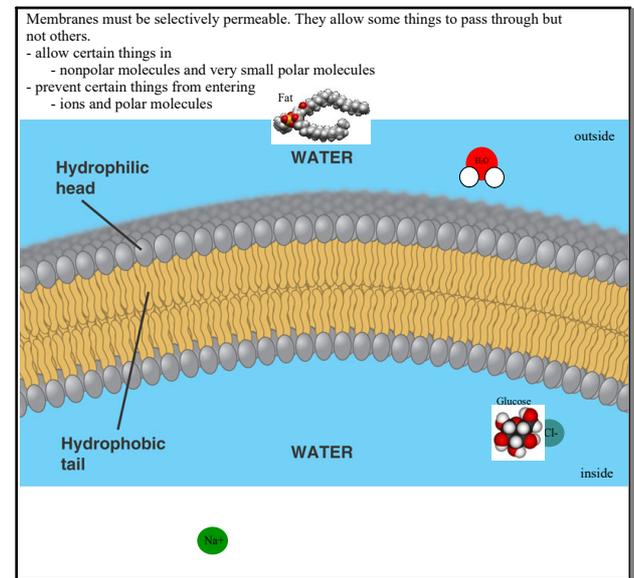
Membrane model



Detergent action

4. Why do we use the term "fluid mosaic model" to describe the cell membrane?
5. How are glycoproteins like hockey jerseys?
6. Why is a membrane important for a cell?
7. Why is it important for the cell membrane to be selectively permeable?
8. How is the structure of the phospholipid important for its function?

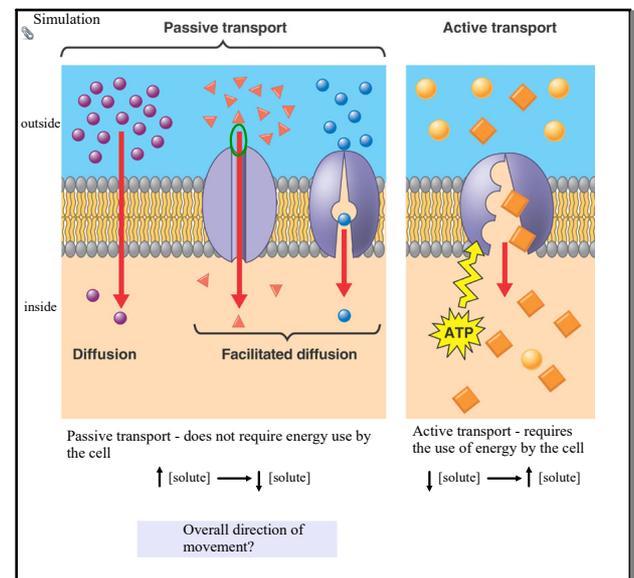
CQ



Bilayer

9. In general, what kinds of things pass easily through the membrane and which do not?
10. Hormones are chemical messengers that travel in the blood throughout the body. Protein hormones (polar) attach themselves to receptors on the cell surface while lipid hormones (nonpolar) actually enter the cell. Explain this difference.

CQ



Transport types

So, what's the overall direction of movement?
 ↑ [😊] → ↓ [😊]

What are the factors that affect the rate of diffusion?
 1. Concentration. As concentration increases, diffusion .
 2. Temperature. As temperature increases, diffusion .
 3. Size. As particle size increase, diffusion .

Diffusion

11. You are given food coloring and three beakers of water. Design an experiment to determine the effect of temperature on the rate of diffusion. Be sure to have a hypothesis and a control.

12. As waste products build up, homeostasis is threatened. How does diffusion help avoid this?

13. Suppose that the concentration of carbon dioxide in the fluid outside a cell became higher than that on the inside. Predict what would happen. What prevents this from happening normally?

14. How is facilitated diffusion a benefit to cells?

CQ

Hypotonic - a solution which is less concentrated (i.e., has less solute) than the cytosol

What does this have to do with cells?
 bag = a cell membrane
 beaker = the solution surrounding a cell

below less

cytoplasm

100% H₂O

10% starch
90% H₂O

- H₂O moves toward the solute

the bag swells because more water enters than exits

Why does this happen?

Osmosis

Hypertonic - a solution which is more concentrated (i.e., has more solute) than the cytosol

more above

10% starch
90% H₂O

100% H₂O
0% starch

the bag shrivels because more water exits than enters

What happens
 Why does this happen?

Osmosis

(a) Hypotonic solution Isotonic solution Hypertonic solution

(b) In plants, this is called turgor pressure

A little practice

Water diffuses Water diffuses in water movement

Effects of Osmosis

phagocytosis

EXTRACELLULAR FLUID CYTOPLASM

Pseudopodium

"Food" or other particle

Food vacuole

Endocytosis

Amoeba feeding

pinocytosis

Plasma membrane

Vesicle

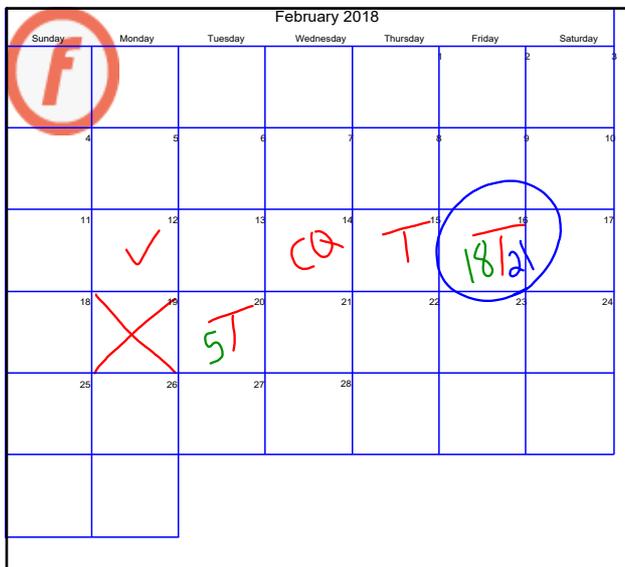
Endocytosis

Property	Simple Diffusion	Facilitated Diffusion	Active Transport
Requires special membrane proteins	No	Yes	Yes
Highly selective	No	Yes	Yes
Has a maximum rate	No	Yes	Yes
Can be inhibited	No	Yes	Yes
Goes against the concentration gradient	No	No	Yes
Requires energy	No	No	Yes

Transport review

15. Imagine that a cell has been in a slightly hypotonic solution for some time and is now isotonic with the solution. Has the movement of water molecules stopped? Explain.
16. A dog pees on your lawn. What do you expect to observe over the next few days? Explain.
17. Why is turgor pressure not used in reference to animal cells?
18. Explain why it is not a good idea to drink distilled water or saltwater.
19. A marathon runner collapses after running on a hot day. Although the runner consumed adequate water along the route, blood testing showed that many of his red blood cells had burst. Why was this the case? (hint: on hot days, runners normally drink fluids that contain sugar and salt.)
20. Gardens always have lots of insects and these insects get onto the plants. When gardeners bring in fresh vegetables from the garden, they sometimes soak them in saltwater before rinsing them and soaking them in freshwater. Why would they do this?
21. Grocery stores spray their vegetables with water to preserve their freshness. Explain how this makes the vegetables appear fresh.

CQ



Feb 12-2:23 PM

Attachments



Diffusion and membrane channels.jar