

Business

- Cell worksheet handed out Wednesday is due Monday.
- There WILL be a quiz up on blackboard following today's lecture.

Pre-Health Professions?

- There will be an informational meeting for freshman and sophomores interested in health related careers next Tuesday, the 22nd of September at 5:00 PM in Edwards 246.

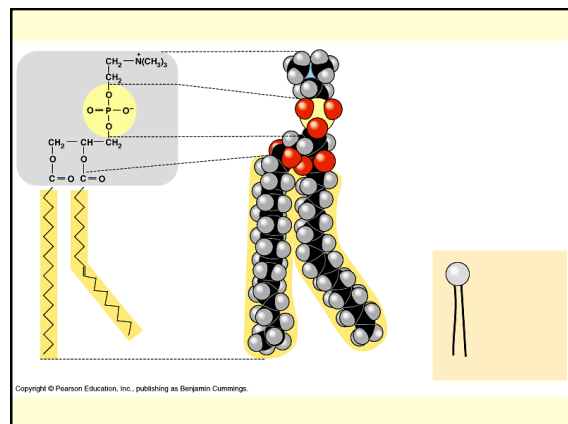
Chapter 7 - Membranes

Membrane Functions

- Separate in from out
 - Keep some things in or out, transport others
- Compartmentalize special functions
- Provide surface for reaction chains
- Communicate with other cells, exterior environment

Membrane Structure

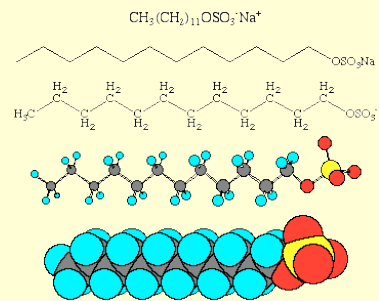
- Main ingredients: phospholipids and proteins (known from biochemistry).
- Phospholipids have lipid tail (hydrophobic) and phosphate head (hydrophilic)



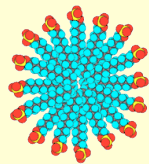
Phospholipids interact with water in interesting ways!

Detergents are amphipathic, like phospholipids.

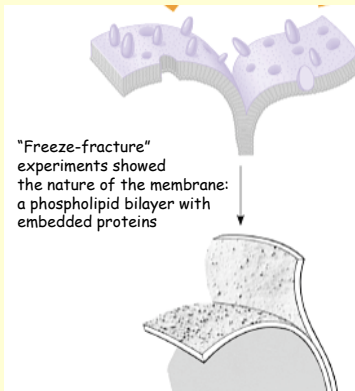
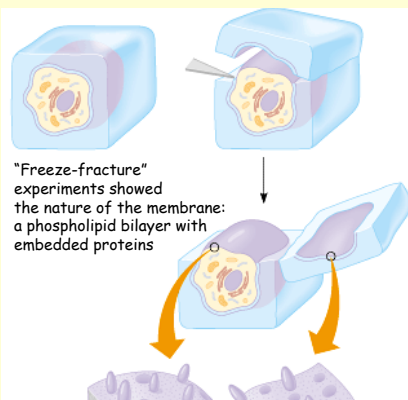
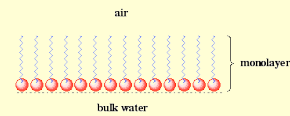
A detergent:

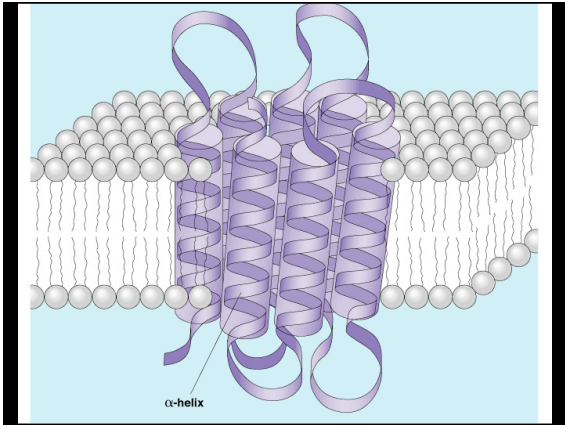


A micelle:



A monolayer film:

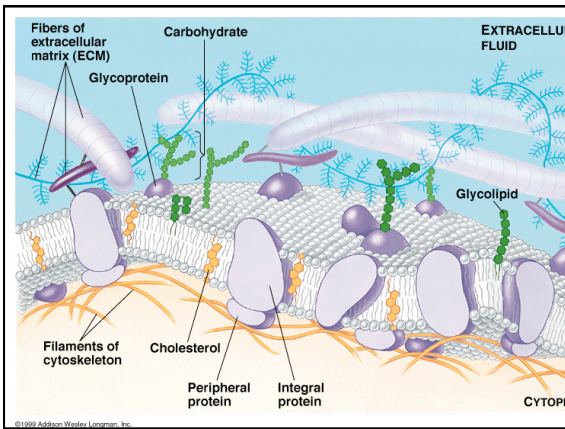




Membrane Proteins serve many functions

<p>Transport</p> <p>(a) (b)</p>	<p>Intercellular joining</p>
<p>Enzymatic activity</p>	<p>Cell-cell recognition</p>
<p>Signal transduction</p>	<p>Attachment to the cytoskeleton and extracellular matrix (ECM)</p>

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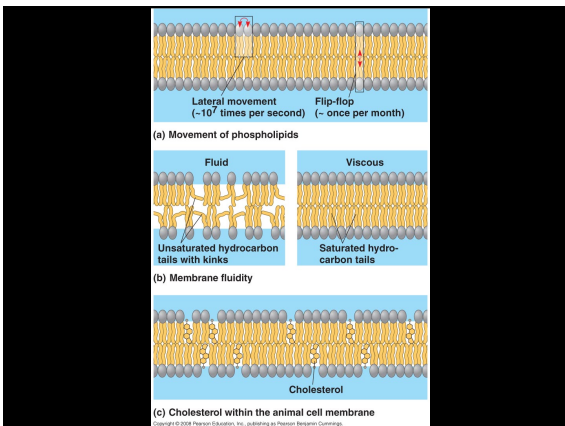


How Are Proteins Attached to the Membrane?

The Fluid Mosaic Model

The diagram illustrates the fluid mosaic model. It shows a cluster of pink circles representing mouse cell membrane proteins and a cluster of purple circles representing human cell membrane proteins. An arrow points to a 'Hybrid cell' where the two clusters are mixed together. A label 'Mixed proteins after 1 hour' points to the hybrid cell, indicating that the proteins have intermingled.

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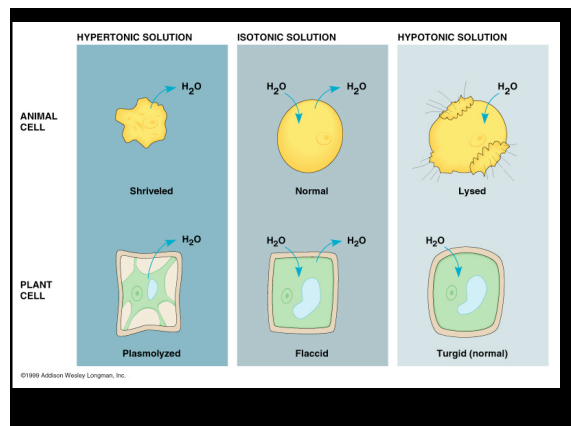
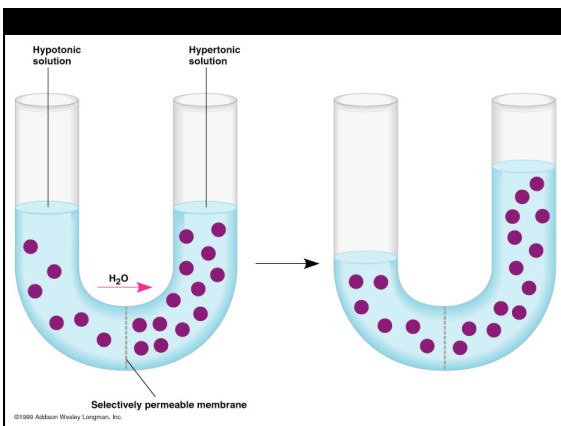
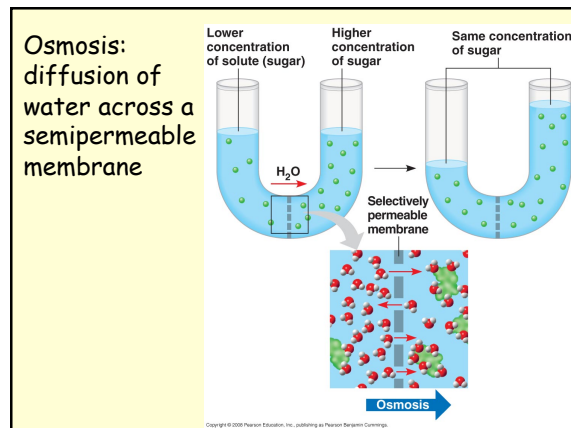
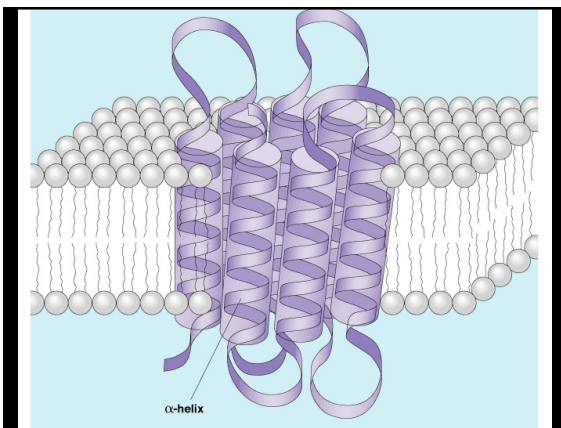
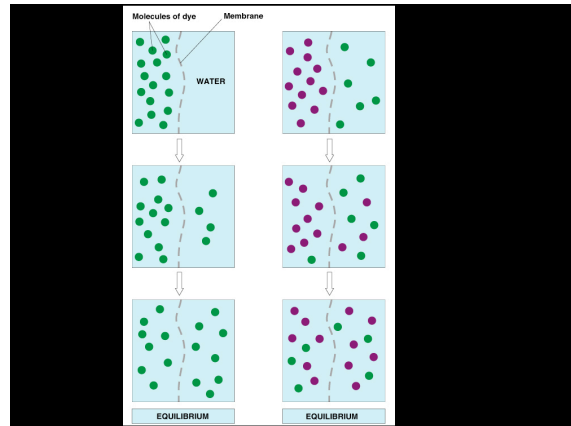


Membrane Transport

What moves across membranes, and how?

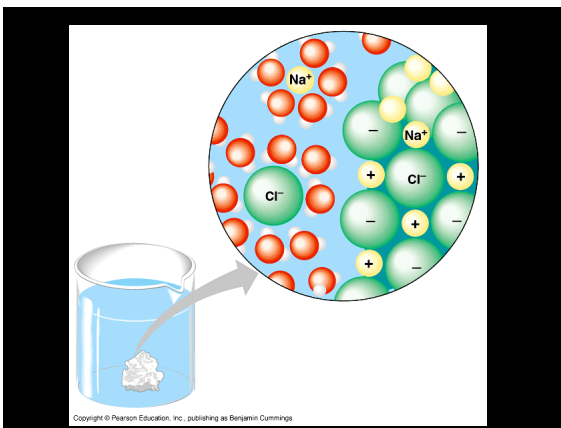
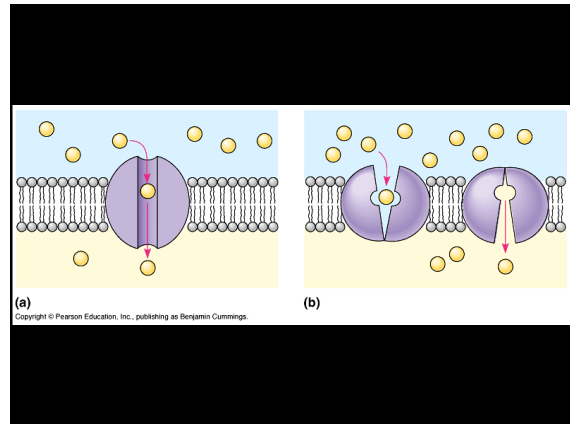
Membrane Transport

- Simple Diffusion
 - What is it?
 - What substances move across membranes by simple diffusion?



Membrane Transport, cont.

- Facilitated Diffusion
 - Carrier proteins
 - Pore proteins



Passive vs. Active Transport

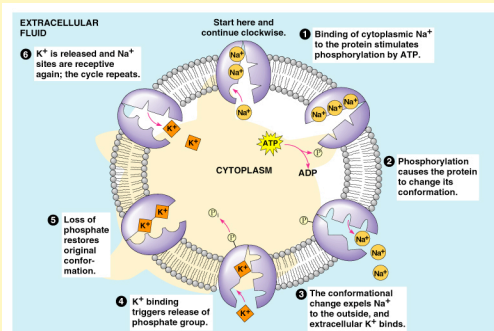
Passive Transport requires no energy, can only move substances "down" a concentration gradient (to the area where they are less concentrated).

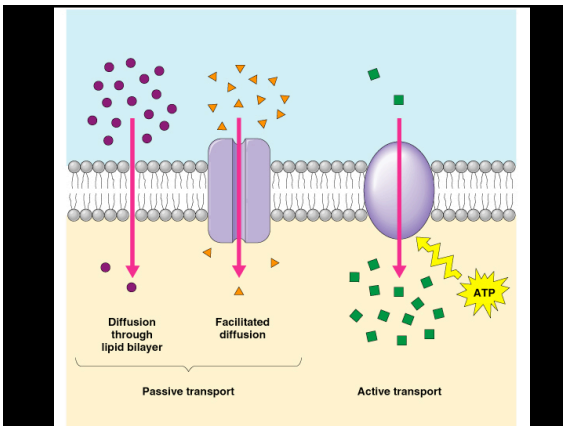
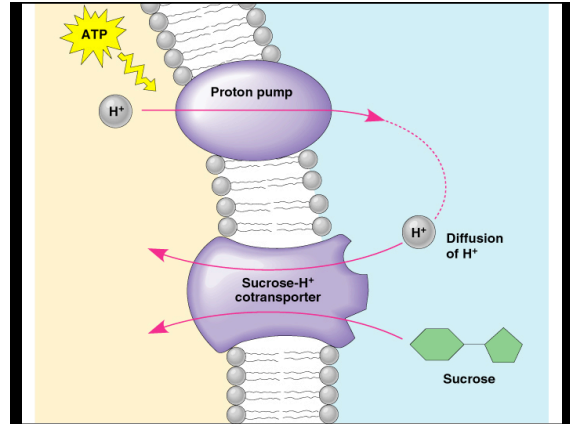
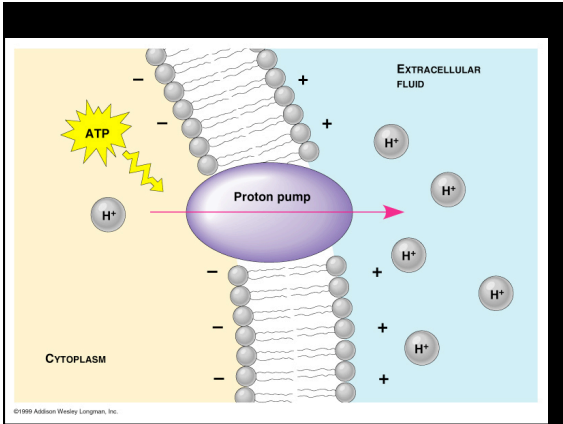
Active Transport requires energy, and can move substances from the area where they are less concentrated into the area where they are more concentrated.

Membrane Transport, cont.

- Active Transport
 - Takes energy, but can move molecules **AGAINST** a concentration gradient
 - Powered by ATP *or*
 - Powered by "cotransport"

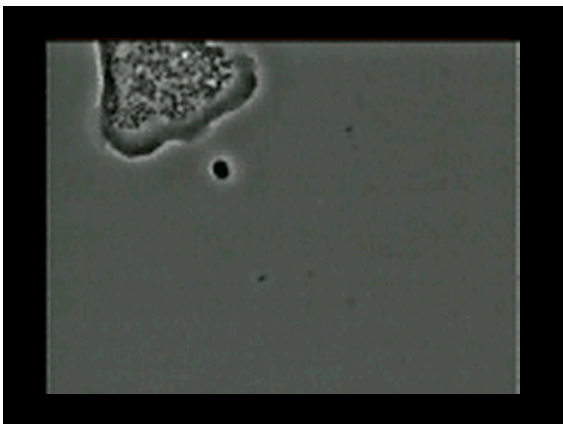
The sodium-potassium pump: ATP-powered active transport





Membrane transport, cont. - moving the big stuff

- Endocytosis
- Exocytosis
- Phagocytosis
- Pinocytosis
- Receptor-mediated endocytosis



Information Transfer across membranes

- Cells gather information using plasma-membrane proteins
- Signal reception, transduction, response
- Types of signals