

Cell Membrane Structure p. 41-43

Fluid Mosaic Phospholipid Bilayer Model of Cell Membrane Structure

function: forms flexible outer boundary of animal cells

acts as protective barrier around cell

regulates what goes in and out of cell

plant cells have cell wall as rigid outer

boundary, however, the cell membrane

still acts as a protective barrier and

regulates what goes in and out of cells in plants

-Phospholipid: with chemical research, scientists figured out chemical nature

1 glycerol + 2 FA + phosphate group

phosphate head is hydrophilic: "water-loving"

FA tails are hydrophobic: "water-hating"

-Bilayer: with EM, scientists figured out there were 2 layers of membrane surrounding the cell

so, 2 layers of phospholipids, but how are they arranged?

there is a watery environment outside

the cell and a watery environment inside the cell

- Mosaic: refers to pattern of proteins inbetween phospholipids**
 - some proteins only interact with outside environmt, some proteins only interact w/inside of cell, some proteins interact w/inside & outside**
- Fluid: refers to movement**
 - proteins can move through phospholipids**
 - the cell membrane is flexible, things can move in & out of cell**

Cellular Transport

cells need to bring things in & out

how does this happen? who regulates?

terms dealing with transport

impermeable: nothing can pass through

permeable: things can pass through

**semipermeable: some things can pass,
others can't, based on size**

**selectively permeable: some things can
pass, others can't, based on selection**

**cell membrane is selectively permeable: actively
allows some things in, not others**

Diffusion: movemt of substances from area of greater concentration to area of lesser concentration until equilibrium is reached

**particles move due to inherent E w/in them,
no outside E is required**

**concentration gradient: a difference in
concentration of substances in adjacent areas**

Osmosis: diffusion of water

**movement of water molecules from area of
greater water concentration----->area of
lesser water concentration until
equilibrium is reached**

**in life, cells are bathed in extracellular fluid
cells also have intracellular fluid (cytoplasm)
the 2 fluids should be osmotically balanced
while the cell membrane can say "no" to many
substances, it does not say no to water
water can move in & out of cell all the
time**

cells can be found in 3 types of conditions

1-isotonic conditions

2-hypertonic conditions

3-hypotonic conditions

**1-isotonic solution: concentration of solutes in
the solution is equal to the concentration of
solutes in the cell**

**thus, water concentration is also equal
and water flows equally in & out of cell**

ex. physiological saline 0.9% NaCl

**RBC in physiological saline is osmotically
balanced, H₂O flows in & out of cell**

**tapwater is balanced w/most body cells,
so it quenches our thirst**

**2-hypertonic solution: there is a greater concent.
of solutes in the solution than inside cell
thus, water concent. is greater inside cell
ex. 5%, 10%, 20% NaCl
RBC in 10% NaCl sol is not osmotically
balanced**

which direction will water move?

what will happen to cell?

crenation: cell shrinkage

**3-hypotonic solution: there is a lesser concent of
solutes in the solution than in cell
thus, water concent is greater outside cell
ex. distilled H₂O, 100% H₂O
RBC in distilled water is not osmotically
balanced**

which direction will water move?

what will happen to cell?

for RBC's: hemolysis or cell bursts

**for other cells in body: plasmolysis, cells will
swell**

**turgor: pressure of water in plant cells that
helps cells maintain shape**