

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

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

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 environment, 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

proteins embedded within phospholipids

recognize substances and say yes, you can
come in or no, you cannot

Diffusion: movement 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

diagram on board

Osmosis: diffusion of water or the movement of water molecules from area of greater water concentration----->area of lesser water concentration until equilibrium is reached

diagram on board

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 concentration of solutes in the solution than inside cell thus, water concentration is greater inside cell

ex. 5%, 10%, 20% NaCl

RBC in 10% NaCl solution is not osmotically balanced

which direction will water move?

what will happen to cell?

crenation: cell shrinkage

3-hypotonic solution: there is a lesser concentration of solutes in the solution than in cell thus, water concentration 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