Proteins of plasma membrane are : channels , carriers , enzymes , receptors , adhesion molecules , cell surface identify markers

Channels

Na+ / k+ / Ca+2

Open & close by signal

Types voltage gated
Ligand gated ion Chanel
Water channel (aquaporins)

Have specific ligand
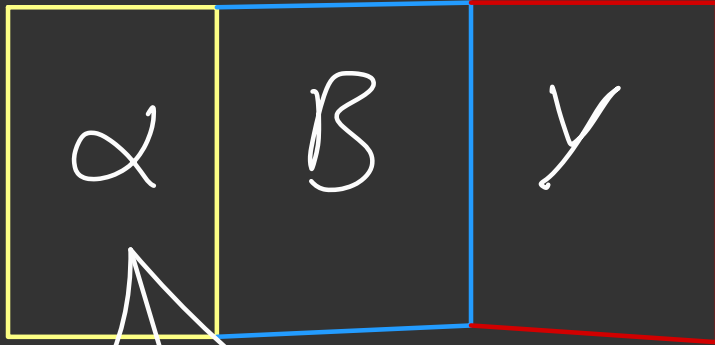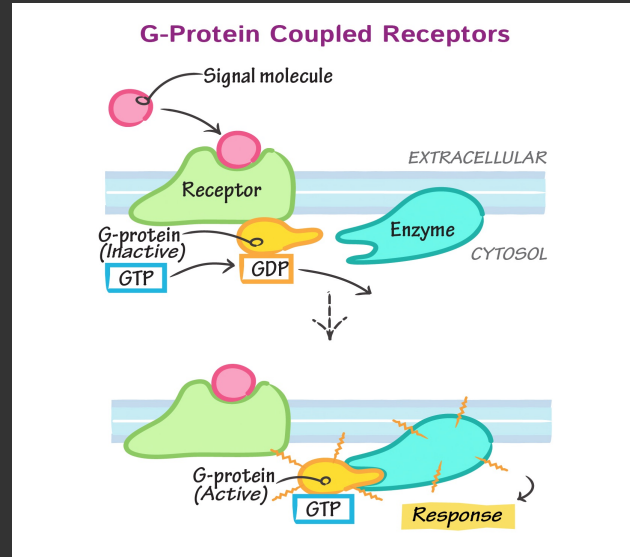
Carriers :
Transport by Conformational change

With or without ATP

Na - k pump

G-protein coupled receptors

α   B   Y

Gaq
activate pLC

Gas
Stimulate ADenylyl cyclase

GaI
inhibitory ADenylyl cyclase

G-Protein Coupled Receptors

Signal molecule

Receptor

EXTRACELLULAR

G-protein (Inactive)

GTP

GDP

Enzyme

CYTOSOL

G-protein (Active)

GTP

Response

1. Ligand bind to receptor
2. G protein become activated alpha separates from beta & gamma
3. If we have G protein that have Ga S then we would turn on adenylyl Cyclase
4. Conc of (CAMP) THEN WE WOULD TURN ON A PROTEIN KINASE A (DEP. CAMP PROTEIN KINASE)
**CAMP IS 2nd messenger

One Ligand ⟶ 1 receptor activated ⟶ many CAMP ⟶ more and more PKA

more &more phospholyation

$$PIP_2 \xrightarrow{PL-C} IP_3 + DAG$$

$$\uparrow [Ca^{+2}]$$

go with pKC
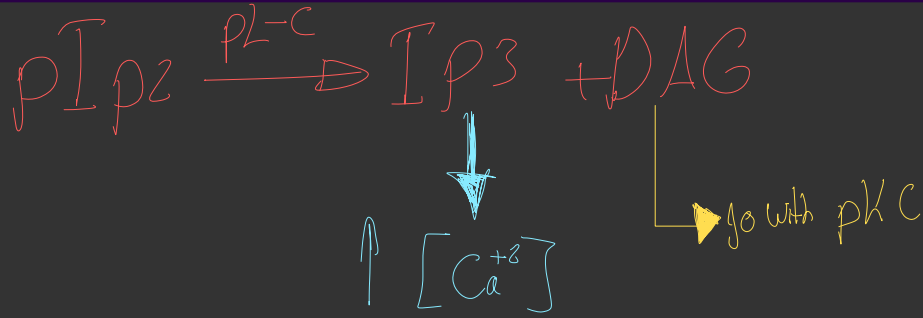
Cell identity markers :
Proteins + carbs = glycoproteins

Ex : MHC MOLECULE

Linkers

Connections between cells called junctions (linkers)

Ex gap junction

Why they are very important ? When a cell is activated like cardiac cells the signal will spread to all other cells (functional syncytium).

Another Ex : DESMOSOMES
CONNECT THE CYTOSKELETONS IN BETWEEN 2 CELLS

Movement across the plasma membrane

Passive transport   Active transport

Facilitated diff   Osmosis   Simple diff
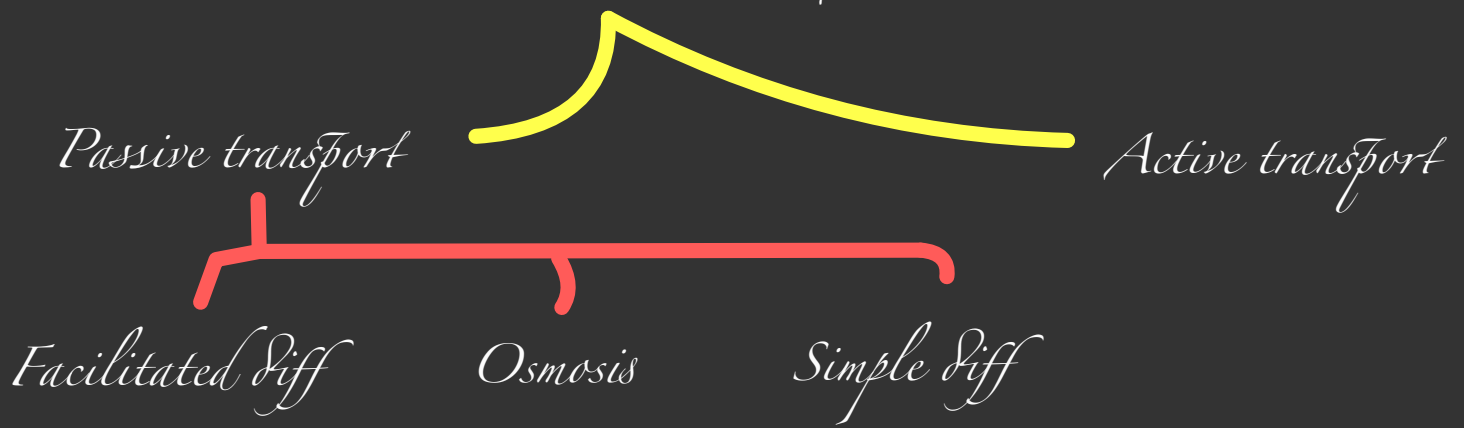
Passive
* without energy (using kinetic energy)

Active uses energy like ATP UNLIKE PASSIVE

Simple diff
*without need of carriers just through the lipid bilayer
Ex : co2 / o2 / steroids/ monoglycerides / VITAMIN (E,D,A,K)

* rate of diff depends on the lipid solubility of each particle طردية

Facilitated diff
* for insoluble lipid substances through channel mediated facilitated diff like
(NA+ , K+)
**OR CARRIER MEDIATED FACILITATED DIFF (GLUCOSE)

No energy input

If we have equilibrium then the net movement is zero
don't misunderstand that there is no movement

The particle permeability in facilitated diff on the number of Chanel's that is opened

Fick's law

Rate of diff (J) depends on 5 factors.-

$$J = P \cdot \Delta C$$

$$P = D \cdot A / \Delta X$$

$$J = D \cdot A \cdot \Delta C / \Delta X \;\Big\} \rightarrow \text{fick's law}$$

Detailed calculations are not required

یعنی $\uparrow \Delta C, \uparrow D, \uparrow A \Rightarrow \uparrow P$

کہ $\uparrow \Delta X \rightarrow \downarrow P$