

PHYSIOLOGY

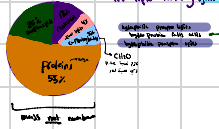


Lec: 3

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Cell membrane

Lipid bilayer [each layer 1 molecule thick] continuous over entire cell surface
7.5-10 nm, composed of proteins & lipids in lipid bilayer



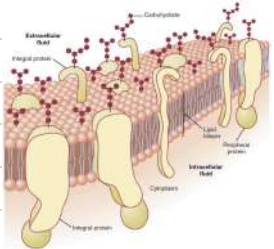
hydrophilic protein heads
hydrophobic tails
hydrophilic protein heads
hydrophobic tails

Fluid Structure, why?

lipid bilayer fluidity enables every membrane protein to move within membrane.

Contains cell membrane fluidity & cholesterol

Cholesterol molecules are packed in between phospholipid molecules, preventing the packing & crystallization of fatty acid chains
many hormones are made of cholesterol which is a lipid
ex: Vitamin, Steroids, sex hormones, all vitamins



Lecture 3

Cell membrane proteins

Integral (transmembrane)

- carrier**
 - under substrate channel receptors
 - allows for movement of ions and molecules, catalyzing, phosphorylation, change inside the cell
- channels**
 - allow substances to pass through
 - ion channels
 - water channels
- cell adhesion molecules**
 - attach to other cells
 - allow for communication between cells
 - cell-cell adhesion
 - cell-matrix adhesion
- gap junctions**
 - allow for direct communication between cells
 - allow for passage of small molecules and ions

- receptors**
 - bind to signaling molecules
 - activate intracellular signaling pathways
- ion channels**
 - allow for passage of ions
 - ion channels
 - water channels
- per substances with diameter < channel diameter**
 - allow for passage of small molecules and ions
- water channel proteins**
 - allow for passage of water
 - aquaporins
- ion channels**
 - allow for passage of ions
 - ion channels
 - water channels

lipid anchors

bound in the lipid bilayer
are covalently attached to the lipid bilayer
also integral

- present on 1 side of the membrane
- primarily serve as **enzymes** that contribute to the external environment
- some are **transmembrane bound enzymes** [inactive unless metabolic process]

peripheral

- bound to hydrophilic [water loving] sides of the lipid bilayer OR integral proteins
- majority of its function → **enzymes** that contribute to the external environment
- short chains of sugars called **glycocalyx** → glyco protein that covers cell membrane
- Some lipids and many proteins exposed on the other surface of the cell membrane are **glycosylated**
- cell distinguishes self from non-self through **glycolipids and glycoproteins** in antibody processing
- most cells have **surface charge** → coat is called **glycocalyx**
- charge is called **glycocalyx**