TOPIC 1- MEMBRANE STRUCTURE

TEXT: CHAPTER 11, pages 347-369

TERMS:
PLASMA MEMBRANE
SYNCYTUM
LIPID BILAYER
FLUID MOSAIC MODEL OF THE MEMBRANE
AMPHIPATHIC
HYDROPHOBIC vs. HYDROPHILIC
GLYCOLIPIDS
GLYCOPROTEINS

TAKE HOME MESSAGE:

Cell biologists support the fluid mosaic model of the membrane. According to the model, membrane structure is based on a double layer of lipid molecules called the bilayer. Under physiological conditions the bilayer is in a fluid state. Membrane proteins float individually in the lipid bilayer.

PHOSPHOGLYCERIDES
SPINGOLIPIDS
STEROLS
PHOSPHOLIPIDS
PHOSPHATIDYLCHOLINE

TAKE HOME MESSAGE:

The lipid portion of the membrane is highly varied. Membranes may contain phosphoglycerides, sphingolipids and sterols. Those that contain phosphate groups are collectively called phospholipids.

ALPHA HELIX

TAKE HOME MESSAGE:

Most membranes contain from 10 to 50 different major protein types. Distribution of hydrophobic vs. hydrophilic amino acids is clustered in segments, some stretching through the membrane. Glycoproteins are almost exclusively on the outer membrane surface.

PHASE TRANSITION

TAKE HOME MESSAGE:

Studies on the physical properties of artificial bilayers reveal two fundamental characteristics that apply to both natural and artificial membranes: They "melt" or "freeze" above or below certain temperatures. Temperatures vary depending upon the types of lipids present.

INTEGRAL VS. PERIPHERAL PROTEINS

TAKE HOME MESSAGE:

Integral proteins are deeply embedded in the bilayer and held in place by nonpolar interactions with membrane lipids. Peripheral proteins are hydrophilic molecules that bind noncovalently to polar membrane surfaces.

PHOTOBLEACHING
TAKE HOME MESSAGE:

Strong evidence is present that the fluid mosaic model is correct: 1) fluid, 2) proteins suspended, 3) proteins can move laterally, and 4) membranes are asymmetric.

ENDOPLASMIC RETICULUM
GOLGI COMPLEX
FLIPPASES
TRANSITION VESICLES
SECRETORY VESICLES
MITOCHONDRIA
LIPID TRANSFER or LIPID EXCHANGE PROTEINS
CHLOROPLAST
SIGNS MECHANISM
MESSENGER RNA (mRNA)
RIBOSOME
CHAPERONES

TAKE HOME MESSAGE:

We know that membranes are dynamic structures that rapidly assemble and disassemble. The endoplasmic reticulum seems to be the site of lipid, protein and carbohydrate insertions.