II. MEMBRANES

A) PHOSPHOLIPID BILAYER

1) STRUCTURE OF PHOSPHOLIPID BILAYER

a) components.

b) spontaneously closes

c) cytoplasmic vs. exoplasmic faces

d) some organelles have two membranes

2) TYPES OF BONDS IN PHOSPHOLIPID BILAYERS

a) hydrophobic interactions - major driving force

b) vanderwaals interactions - packing hydrophobic tails

c) H bonding between polar head groups and water

d) electrostatic interactions

3) FLUIDITY OF PHOSPHOLIPID BILAYER

a) lateral movement

b) flip flop movement - unfavorable

c) determinants of fluidity

B) MEMBRANE PROTEINS

1) PERIPHERAL

a) interact with proteins or polar head groups of lipids

b) examples: spectrin, actin, PKC, ECM proteins

2) INTEGRAL

a) most contain residues with hydrophobic side chains

b) most are transmembrane

i) may span membrane one or multiple times.

ii) examples are receptors, pores, ...

iii) types of chemical interactions

iv) can be removed with detergents

c) some integral proteins only penetrate 1 leaflet; 3 types

i) glycosylphosphatidylinositol (GPI) anchored

ii) myristoylated

iii) farnesyl-anchored proteins

d) integral membrane proteins bind asymmetrically

- no flip flop movements

C) MEMBRANE CARBOHYDRATES

1) OFTEN MADE OF OLIGOSACCHARIDES

2) TYPES OF MEMBRANES THAT CONTAIN CARBOHYDRATES

3) TYPES OF CARBOHYDRATES IN MEMBRANES

a) glycoprotein: covalently bound to protein

i) exoplasmic face of plasma membrane

ii) They function to increase the proteins' solubility

iii) important for proper folding

b) glycolipid: covalently bound to lipid

i) glycolipids are found on the exoplasmic leaflets

ii) carbohydrate portion faces the outside

iii) glucosylcerebroside is an example of a glycolipid

iv) gangliosides in the membranes of many nerve cells

v) blood group antigens are glycolipids or glycoproteins

D) POLARIZED MEMBRANES

1) INTESTINAL EPITHELIAL CELLS

a) apical membrane

i. faces the intestinal lumen

ii. contains microvilli

iii. specializes in absorption

iv. hydrolytic enzymes are components of a glycocalix

b) basolateral membrane

i. faces the underlying connective tissue and blood supply

ii. specialized in transfer of absorbed nutrient into circulation

iii. contains proteins that anchor the cell to the basal lamina

c) tight junctions

2) PANCREATIC ACINAR CELLS

a) function to secrete various digestive enzymes

b) function and structure of pancreatic acinus

c) apical membrane

d) basolateral membrane