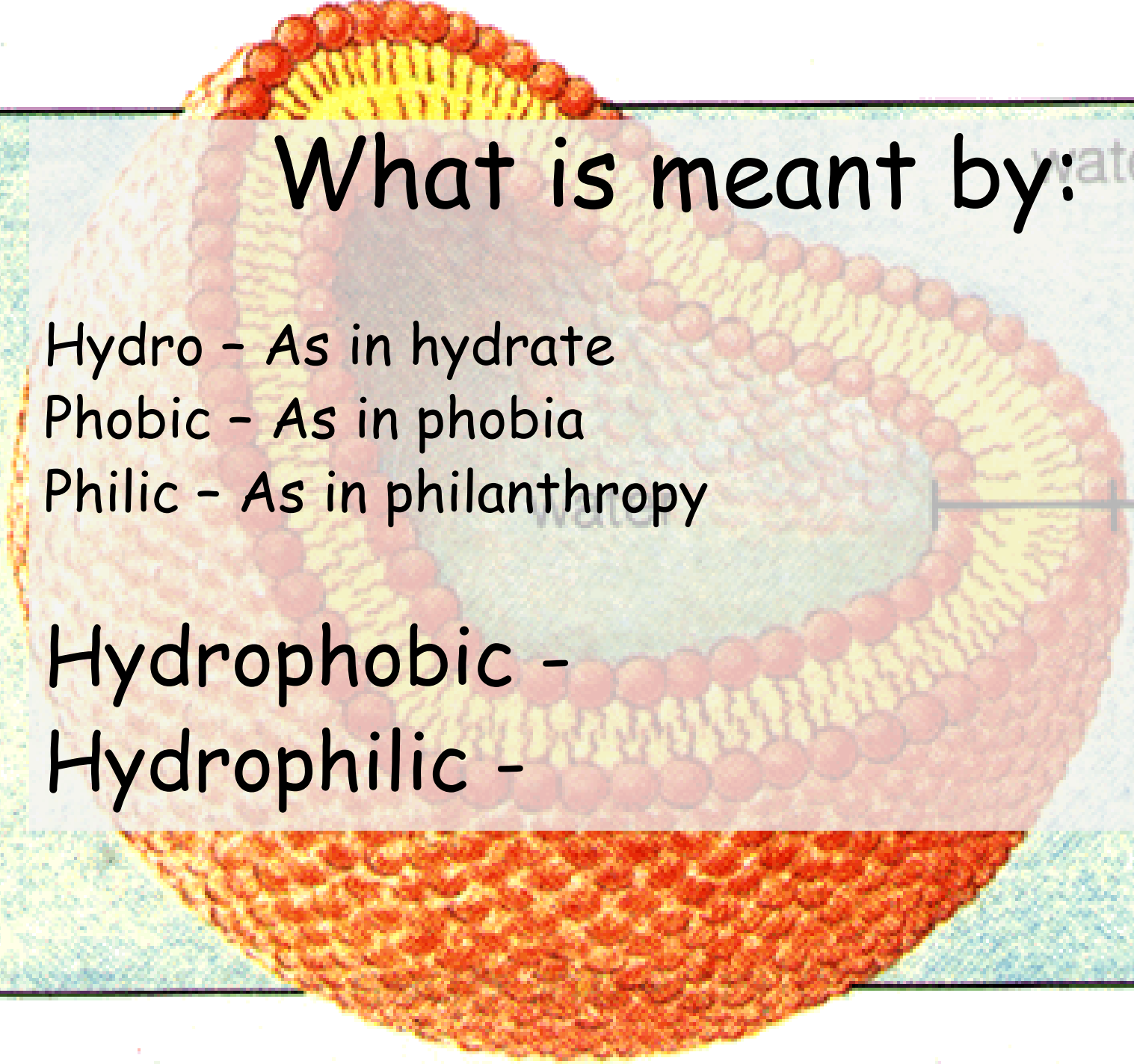
# What is meant by:

Hydro – As in hydrate
Phobic – As in phobia
Philic – As in philanthropy

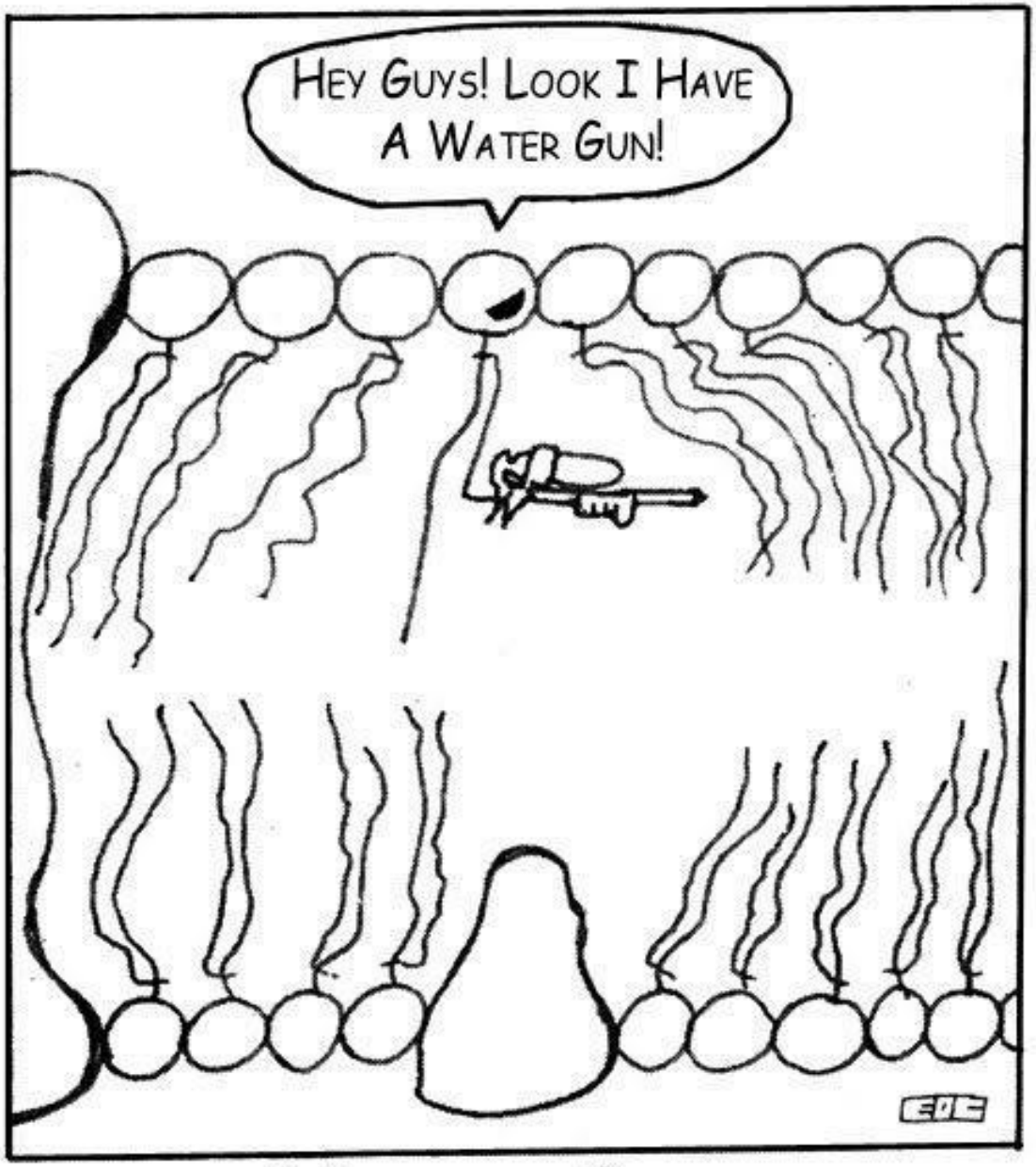



Hydrophobic -

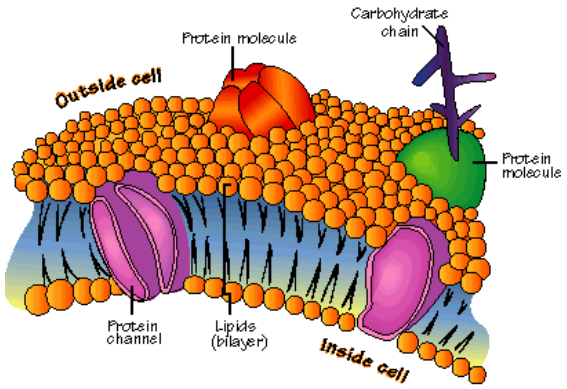
Hydrophilic -

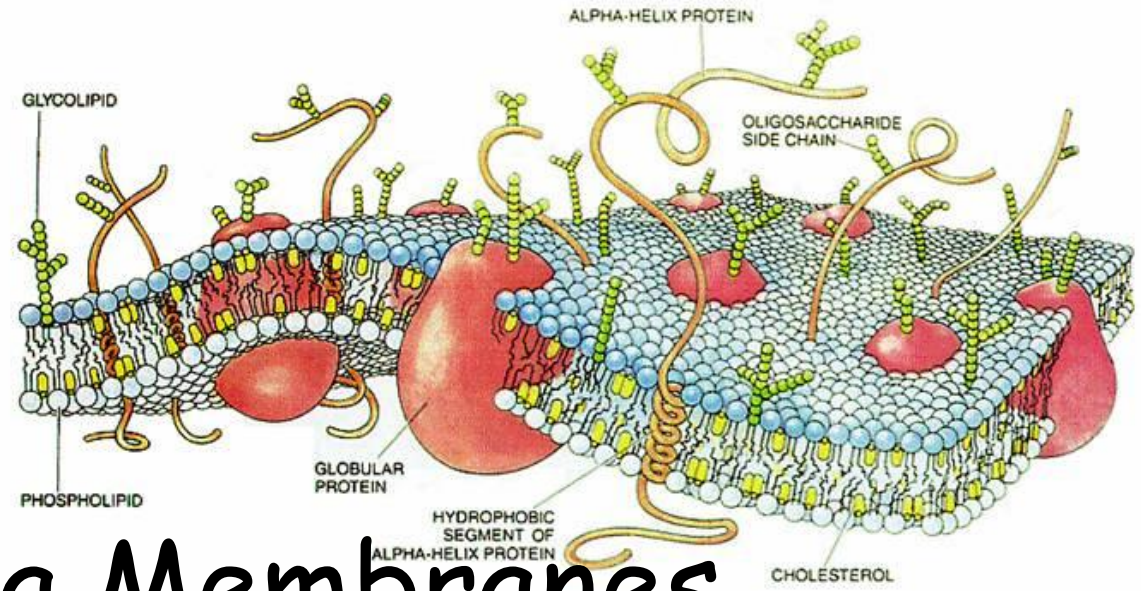
# Challenge

- You front is hydrophilic and back is hydrophobic.
- If either side of you have to stay in contact with stuff you don't like… you will come apart!
- You and your friends are going to be dunked in water…. Find a way to not come apart!



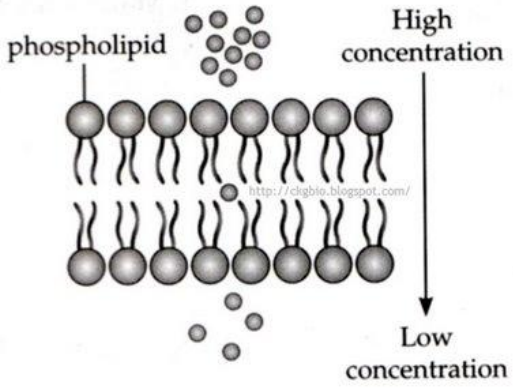

# MEMBRANE PRANKS



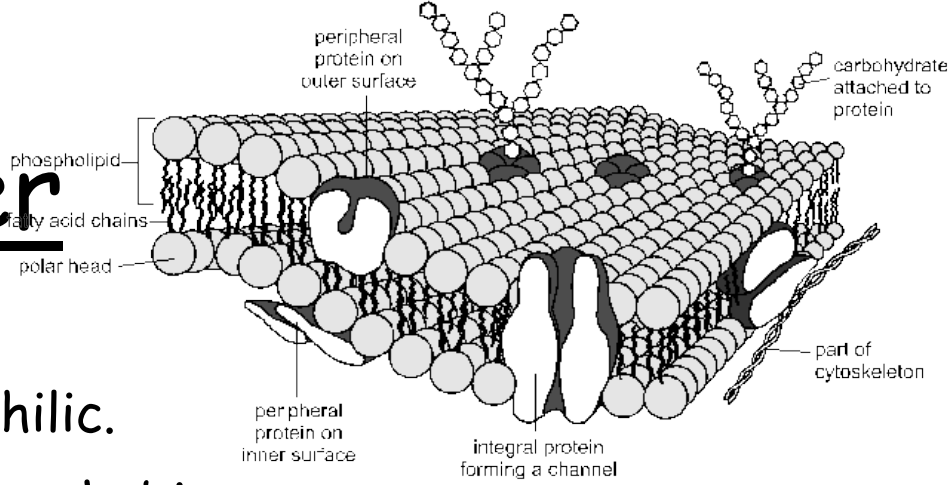




# Plasma Membranes

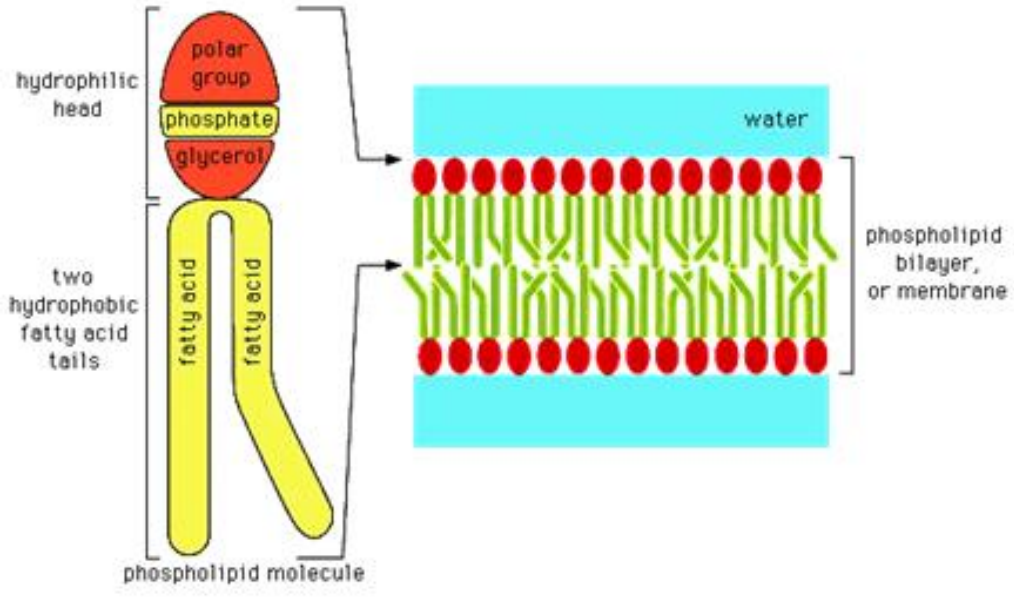
**Aim:** To recall the parts and describe the structure of plasma membranes

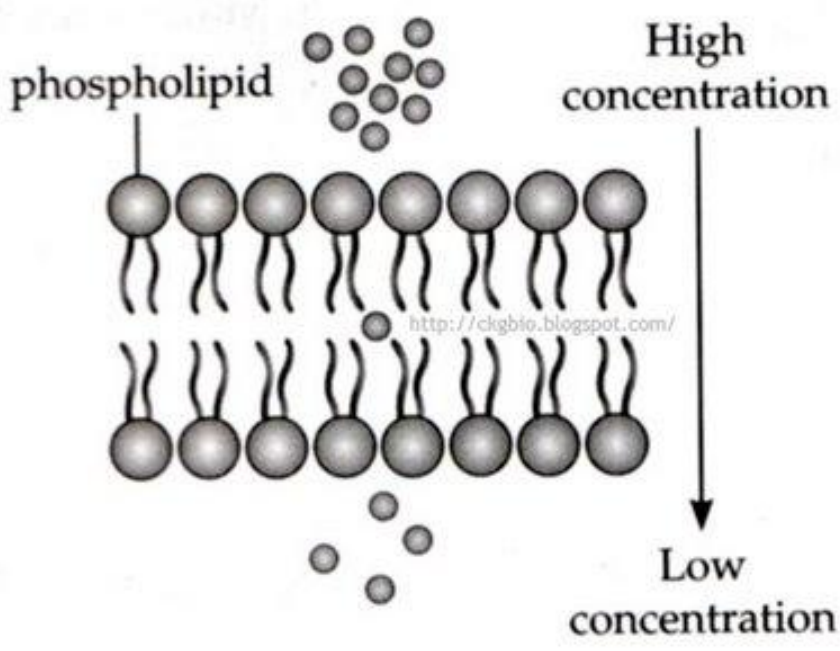


# Phospholipid Bilayer




- **Phospholipids** form bilayers
  - Polar head (phosphate) – hydrophilic.
  - Non-polar tail (fatty acid) – hydrophobic.
- Fatty acid tails: Saturated/unsaturated (*kinky – tail*).
- More unsaturated = more fluid.

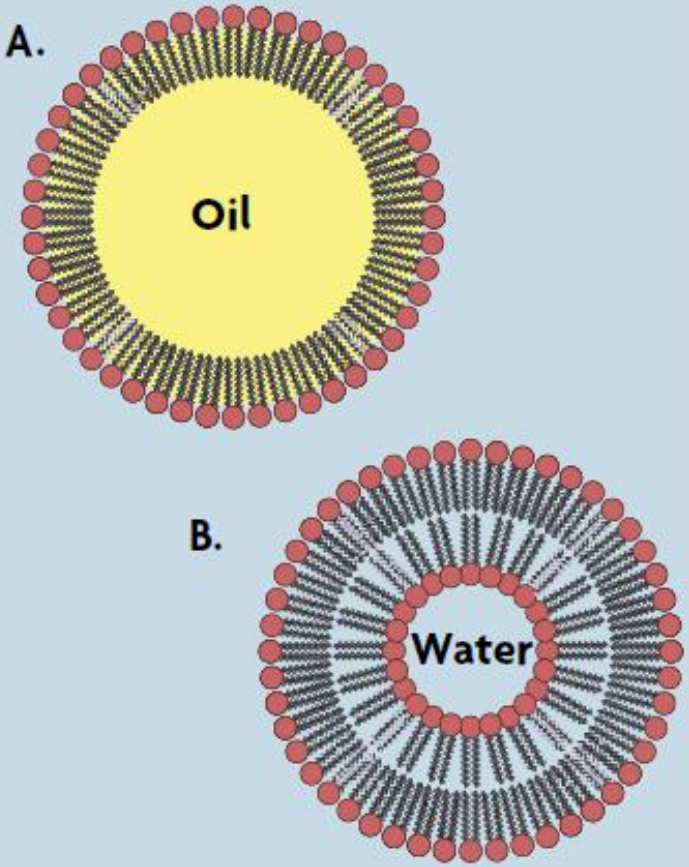


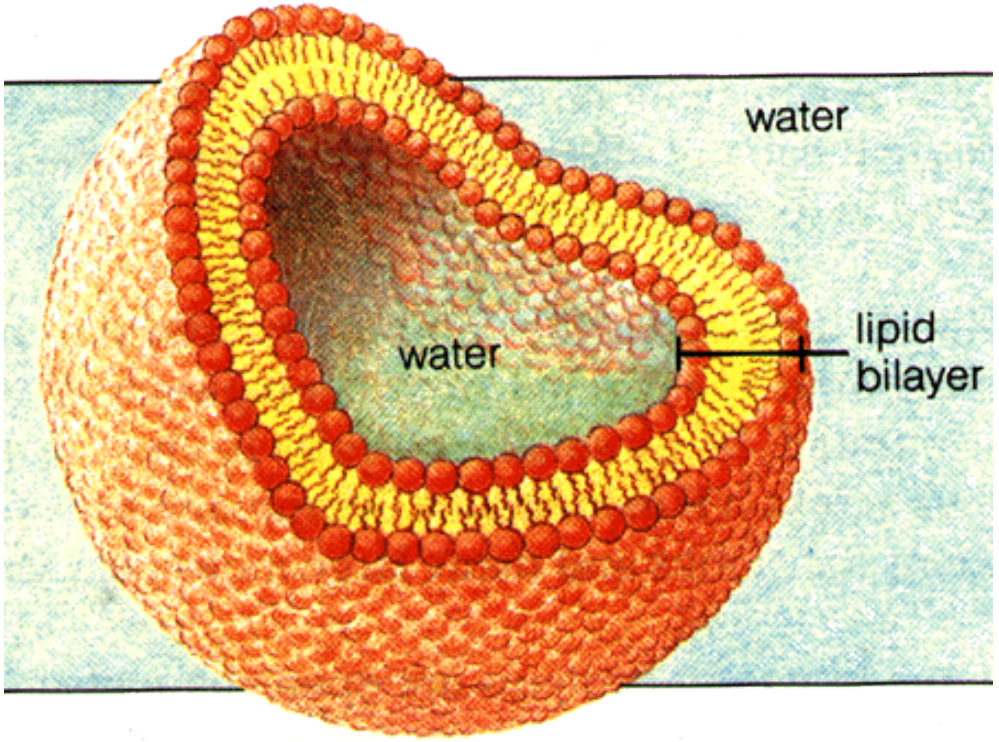



# Self Assembly Demo

**FIGURE 3**

**A. Phospholipids form a single monolayer membrane around an oil droplet.**
**B. Basic lipid bilayer structure of cell membrane.**



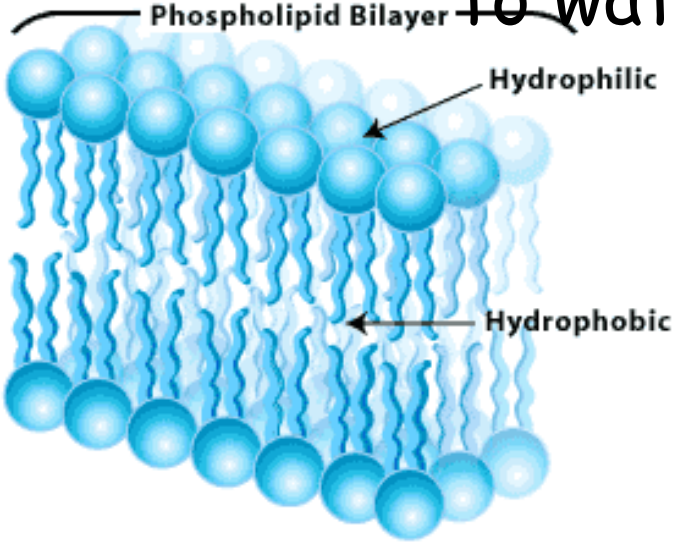

Lipid-soluble substances move through PM more easily than water-soluble, which use temporary protein channels.

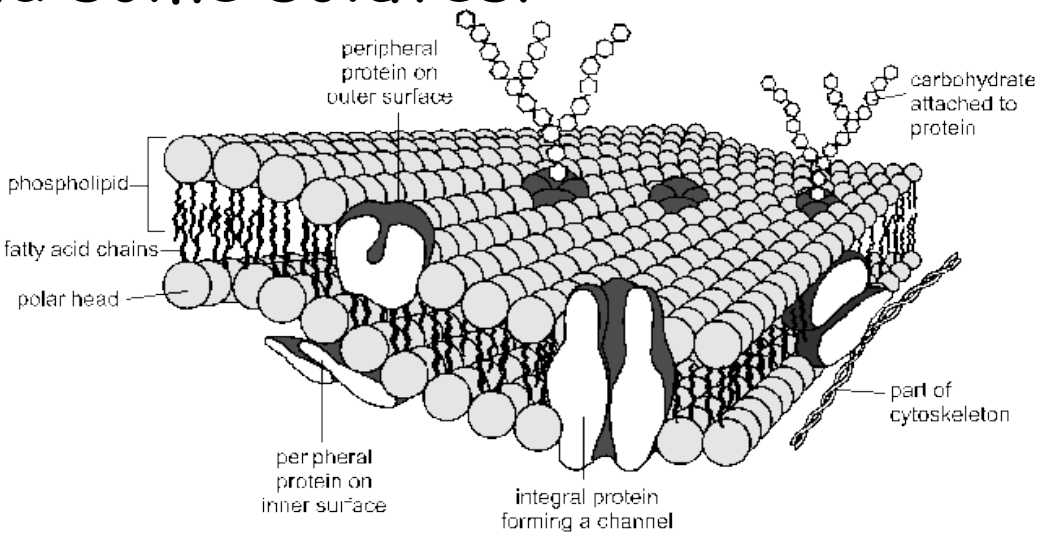
# Structure: Phospholipid Bilayer

- 7 - 8 nm
- Mostly protein & lipid.
- Phospholipids move in layer, allowing *some* lipid (fat) soluble to pass through, not water soluble.
- Glycolipids, glycoproteins and cholesterol also present.

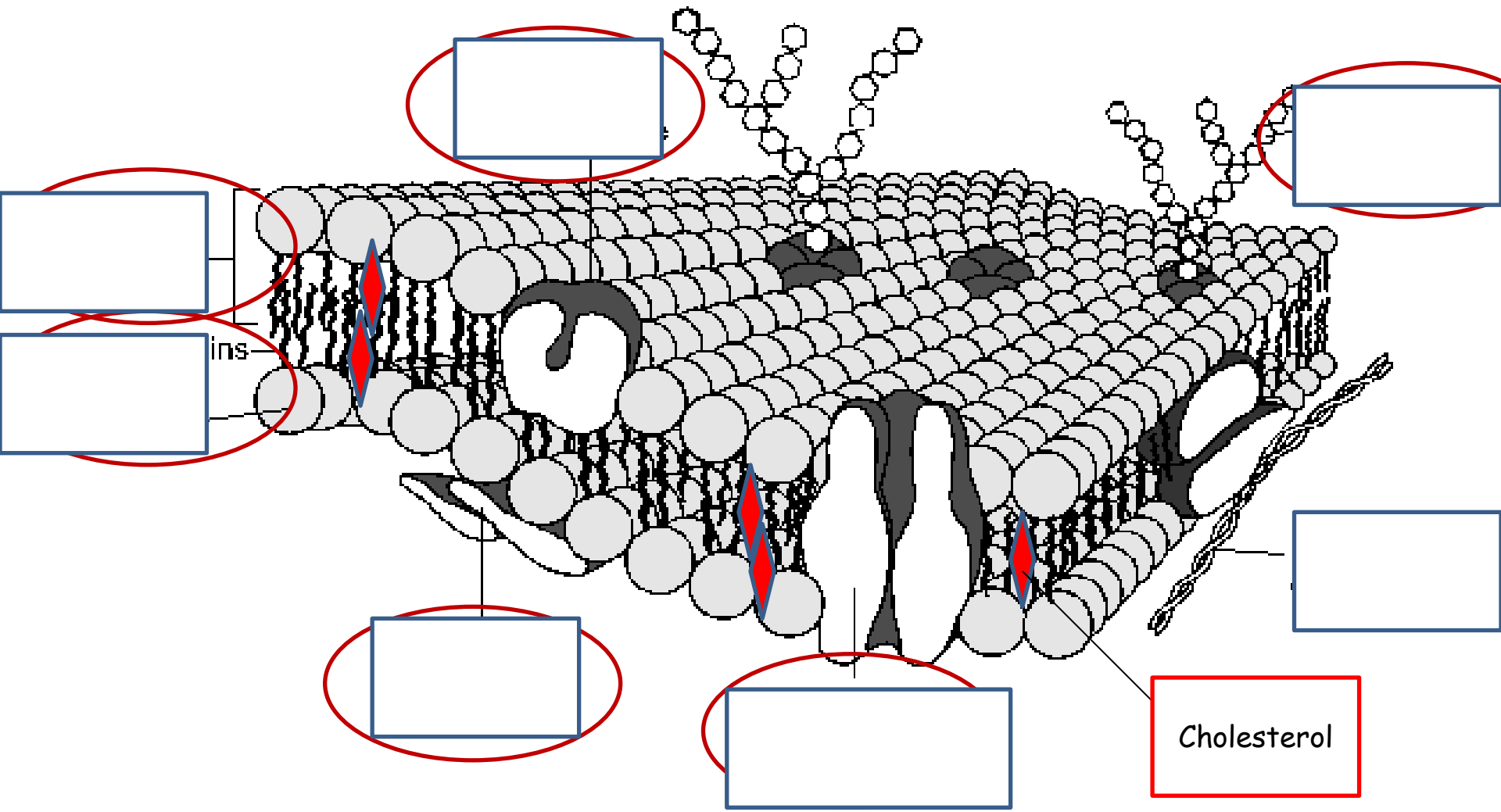
## Selectively permeable

to water and some solutes!



Proteins (integral/peripheral), Hydrophilic pores/channels (in some proteins), glycoproteins, glycolipids and cholesterol




**Use this info to see which ones you can label on your diagram**

A. Phosophlipid

A1. Phosphate head

A2. Fatty acid tail

B. Glycolipid

C. Glycoprotein

D. Polysacharide (part glycoprotein)

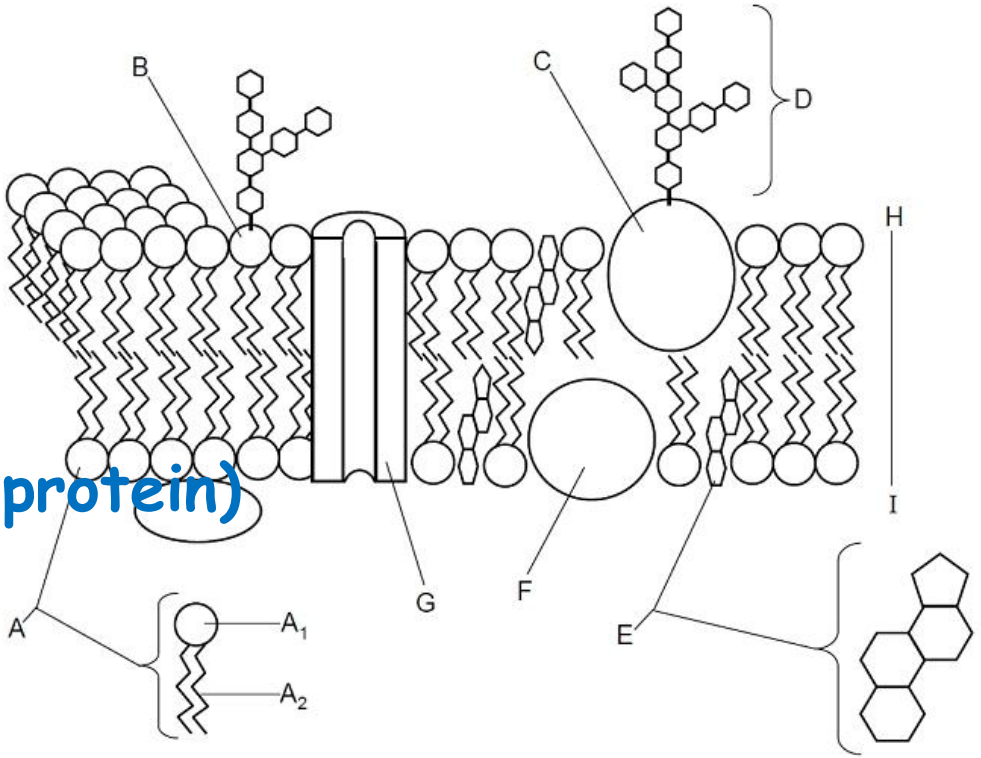
E. Cholesterol

F. Integral protein

G. Integral protein channel

H-I. Phospholipid bilayer

Unlabelled. Peripheral protein

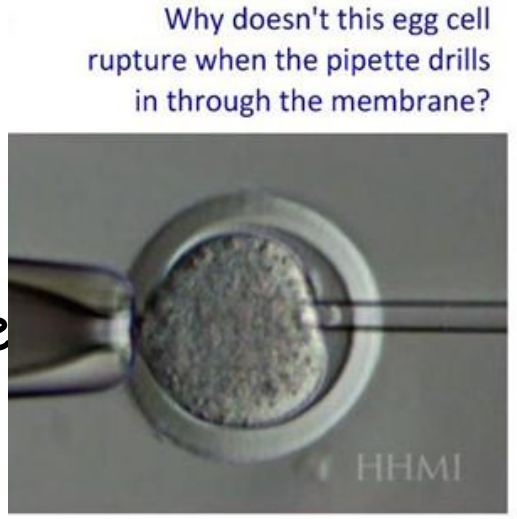


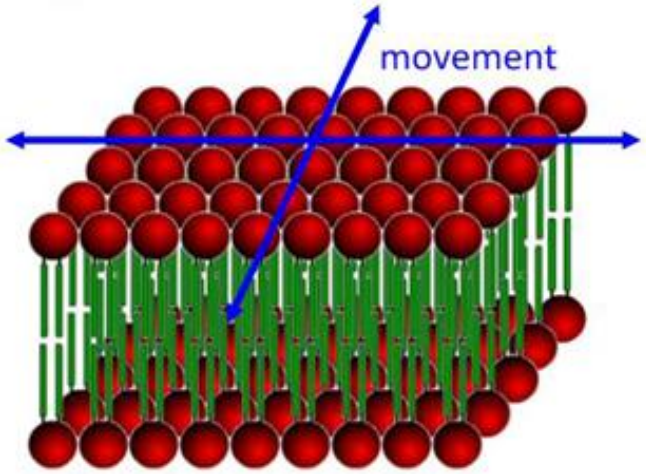

How many did you manage?

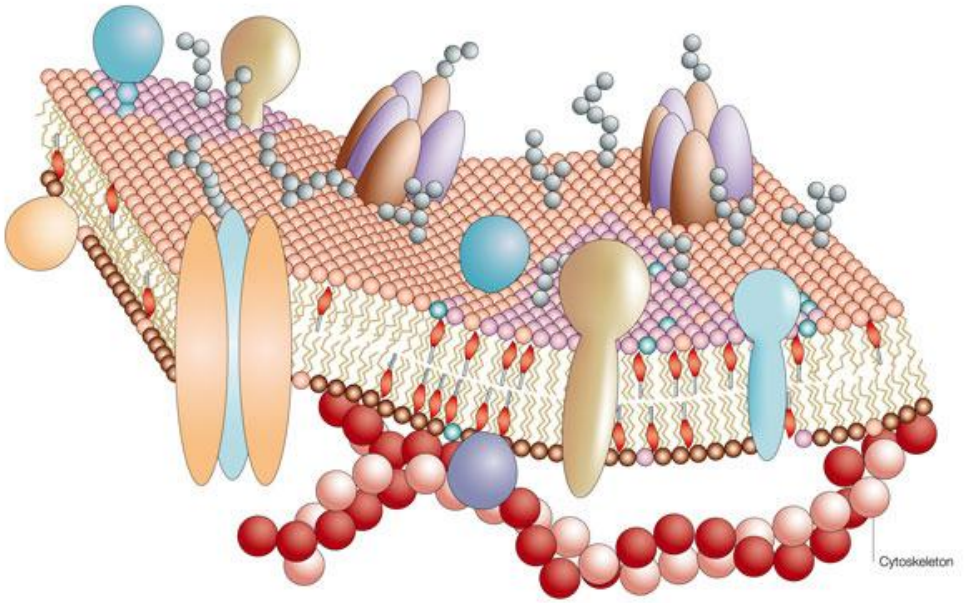
Marks / 11

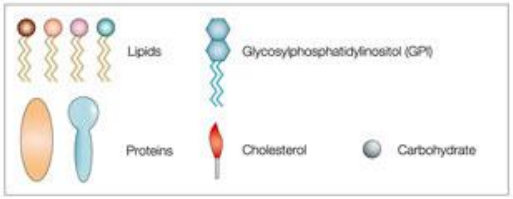
# The Fluid Mosaic Model

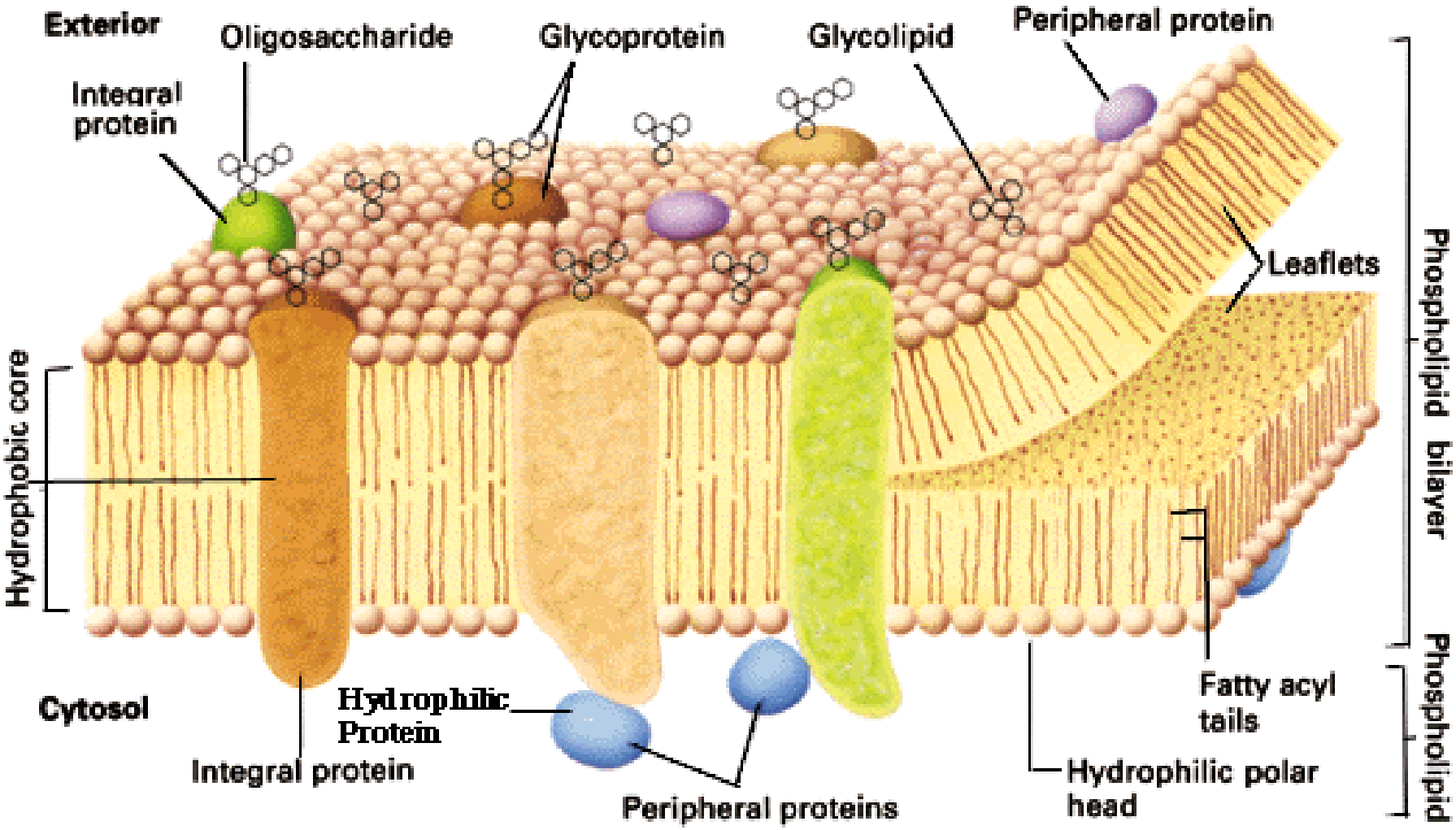
- 1972
- Attached labeled antibodies to membrane bound antigens on 2 cells
- Fused cells – saw 'mixing' of the colors
- Many weak attractions = strong flexible
- <u>Fluid nature</u> of membrane.

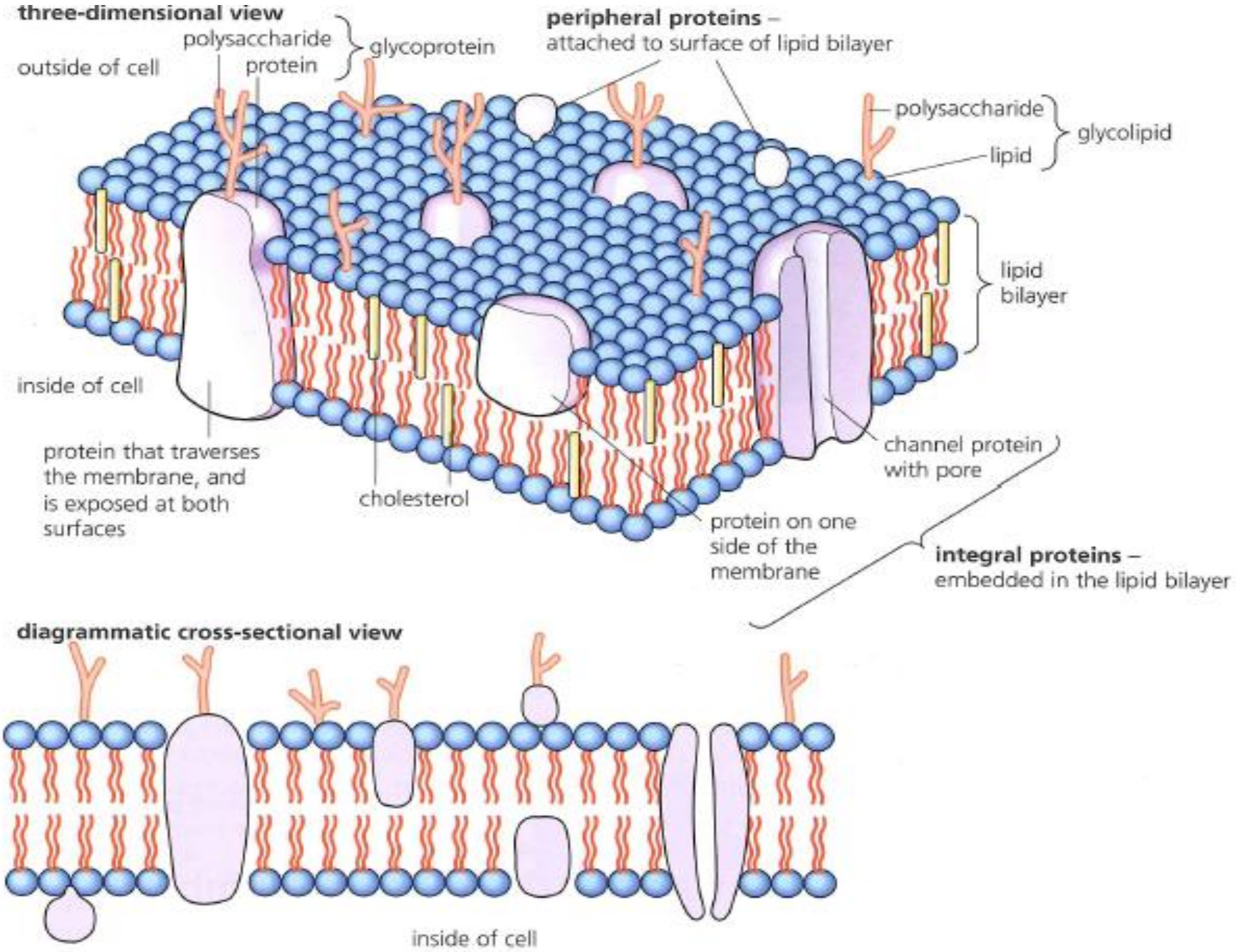



Exterior
Oligosaccharide
Glycoprotein
Glycolipid
Peripheral protein
Integral protein
Leaflets
Hydrophobic core
Phospholipid bilayer
Cytosol
Hydrophilic Protein
Integral protein
Peripheral proteins
Fatty acyl tails
Hydrophilic polar head
Phospholipid


three-dimensional view
polysaccharide
protein
glycoprotein
outside of cell
peripheral proteins –
attached to surface of lipid bilayer
polysaccharide
lipid
glycolipid
lipid
bilayer
inside of cell
protein that traverses
the membrane, and
is exposed at both
surfaces
cholesterol
channel protein
with pore
protein on one
side of the
membrane
integral proteins –
embedded in the lipid bilayer
diagrammatic cross-sectional view
inside of cell

# Check your learning

- Explain the fluid mosaic model of membrane structure in 1 sentence
- Now try 3 words
- ('fluid mosaic model' does not count!!!)

# P.M. Bingo!

| | | |
|---|---|---|
| Glycoprotein | Glycolipid | Phosphate |
| Fatty acid | Lipid | |
| Hydrophobic | Hydrophilic | Cholesterol |
| Lipid-soluble | Water soluble | |
| | Phospholipid | Fluid |
| Temporary-protein-channels | | Bilayer |
| Selectively-permeable | | Protein |
| | Mosaic | Water |