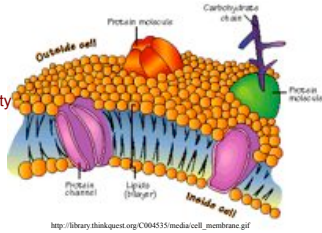


# Cell Membranes

## Today's Topics

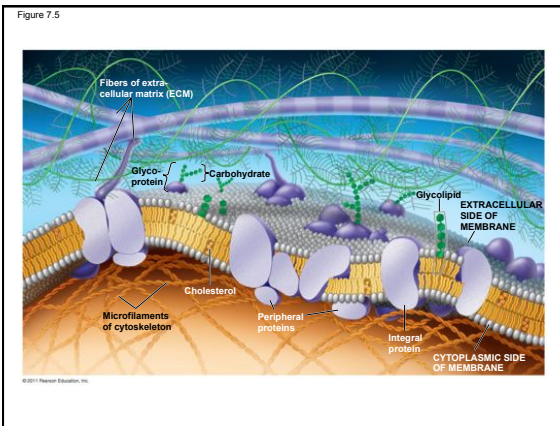
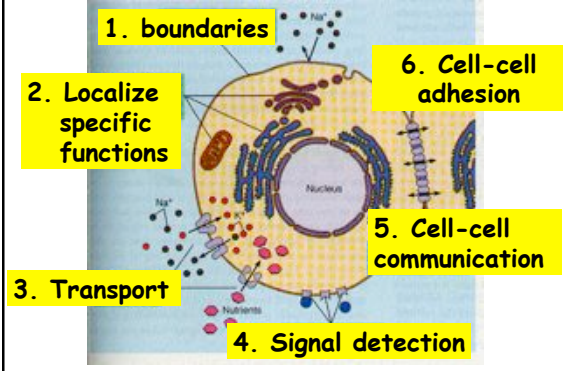
- Membrane Structure
  - Fluid Mosaic Model
  - How appropriate fluidity is maintained
- Diffusion
- Osmosis



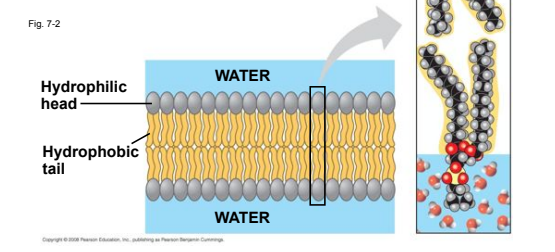
[http://library.thinkquest.org/C004515/media/cell\\_membrane.gif](http://library.thinkquest.org/C004515/media/cell_membrane.gif)

Sept 17, 2012

## Membrane Functions



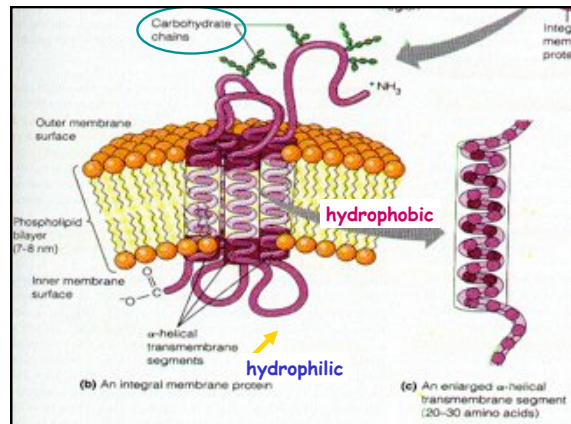
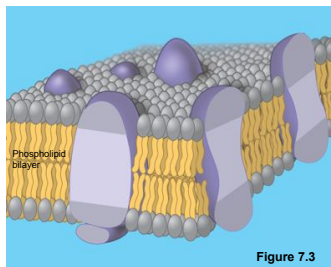
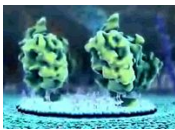
## Phospholipid bilayer



## Membrane Structure: The Fluid Mosaic Model

1972 Singer & Nicholson

- Proteins embedded and floating in a sea of phospholipids



- Membrane proteins and lipids are synthesized in the ER and Golgi apparatus

~25% of known genes code for membrane proteins

Most drugs target membrane proteins

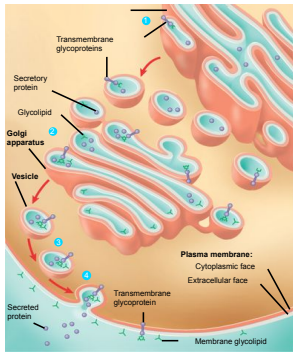
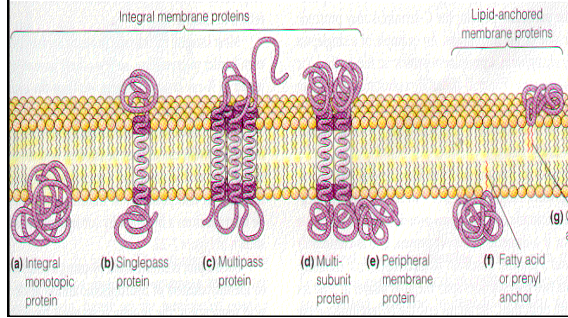


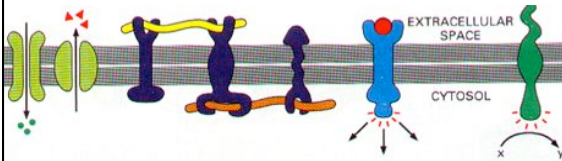
Figure 7.10

### Membrane proteins

- Integral proteins
- Peripheral proteins
- Lipid-anchored



### Roles of membrane proteins?



- Transport
- Links to structural proteins
- Receptors
- Enzymes
- Energy Generation

### Evidence for the Fluid Mosaic Model?

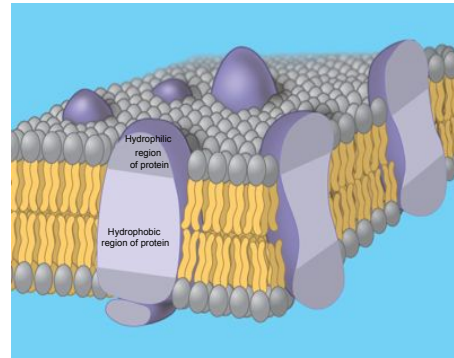
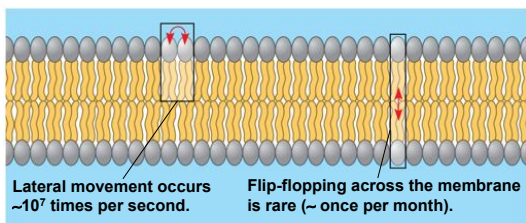


Figure 7.6

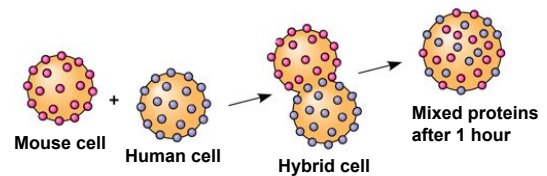
### The Fluidity of Membranes



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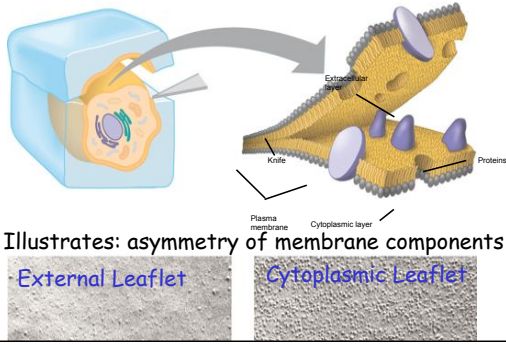
Figure 7.7

### Evidence for membrane fluidity?

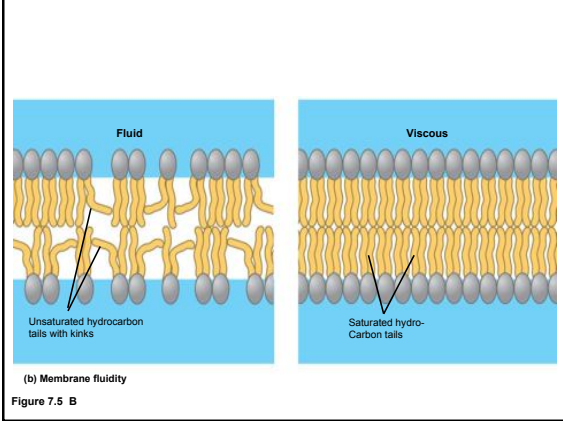


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**Evidence for integral membrane proteins:**  
Freeze-Fracture Electron Microscopy



Illustrates: asymmetry of membrane components



**Cholesterol**

- At low temperature has a loosening effect
- At high temperature has a stiffening effect

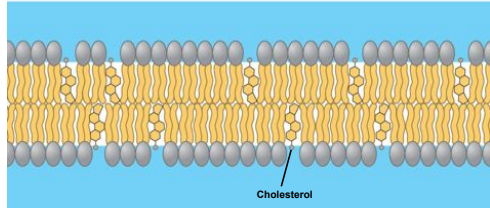
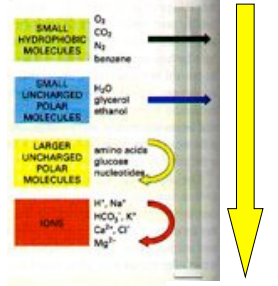


Figure 7.5 (c) Cholesterol within the animal cell membrane

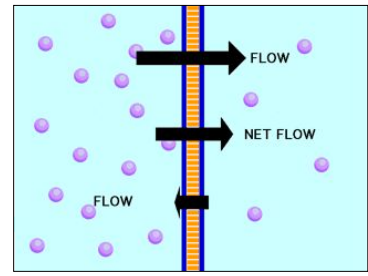
1. Lipid bilayers are selectively permeable

- small, nonpolar
- small uncharged, polar
- larger uncharged, polar molecules
- ions

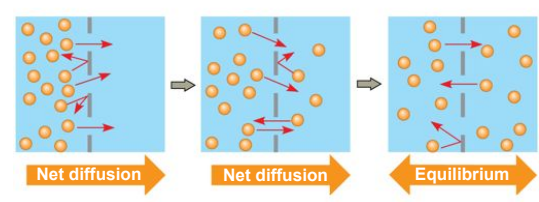


Size - polarity - ions

**Diffusion**



**Simple Diffusion:**



(a) Diffusion of one solute

