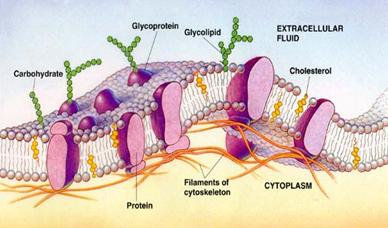
ADVANCED BIOLOGY: MEMBRANE TRANSPORT AND CELL SIGNALING

(USE CHAPTER 7AND 11 AS A RESOURCE)

Selective Permeability

CELLULAR MEMBRANES ARE FLUID MOSAICS OF LIPIDS AND PROTEINS



Amphipathic

Fluid Mosaic Model

1. The Fluidity of Membranes
2. Phospholipids
3. Proteins
4. Cholesterol
5. Evolution of Differences in Membrane Lipid Composition
6. Extreme cold
7. Extreme heat
8. Varied Temperatures
9. Membrane Proteins and Their Functions
10. Integral Proteins
11. Peripheral Proteins
12. Functions

(1)

(2)

(3)

(4)

(5)

(6)

4. The Role of Membrane Carbohydrates in Cell-Dell Recognition

a. Cell to Cell Recognition

b. Types

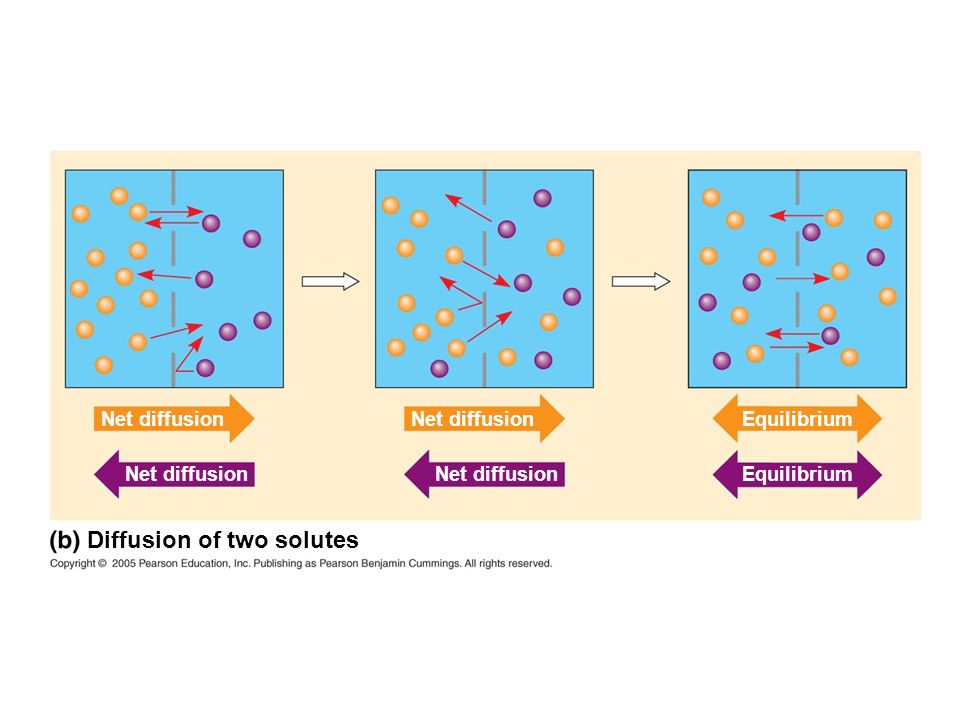
5.Synthesis and Sidedness of Membranes

MEMBRANE STRUCTURE RESULTS IN SELECTIVE PERMEABILITY

Substances that move it and out

1. The Permeability of the Lipid Bilayer
2. What can pass through?
3. What can’t pass through?
4. Transport Proteins
5. Channel proteins
6. Aquaporins
7. Carrier proteins
8. Specificity

PASSIVE TRANSPORT IS DIFFUSION OF A SUBSTANCE ACROSS A MEMBRANE WITH NO ENERGY INVESTMENT

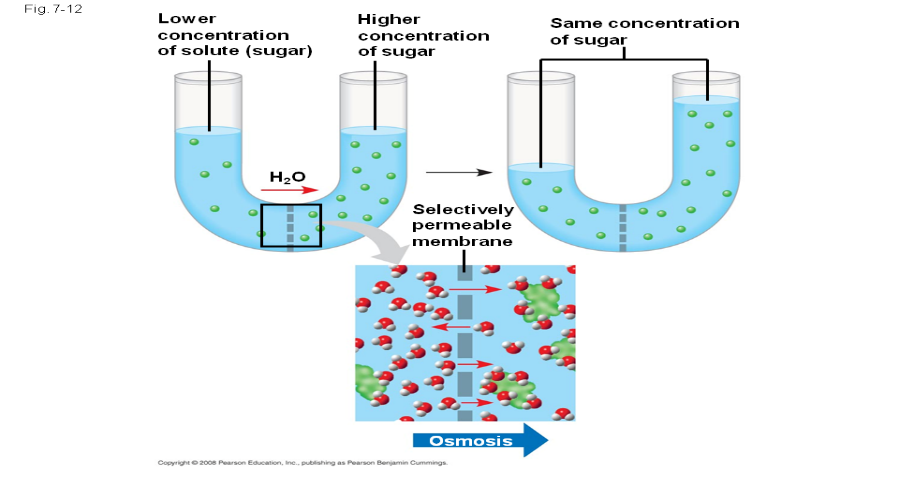


Diffusion

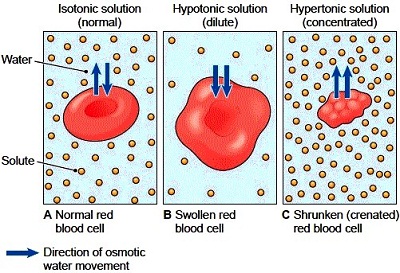
Concentration gradient

Passive transport

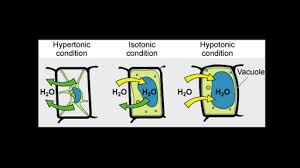
1. Effects of Osmosis on Water Balance



1. Water Balance of Cells Without Walls



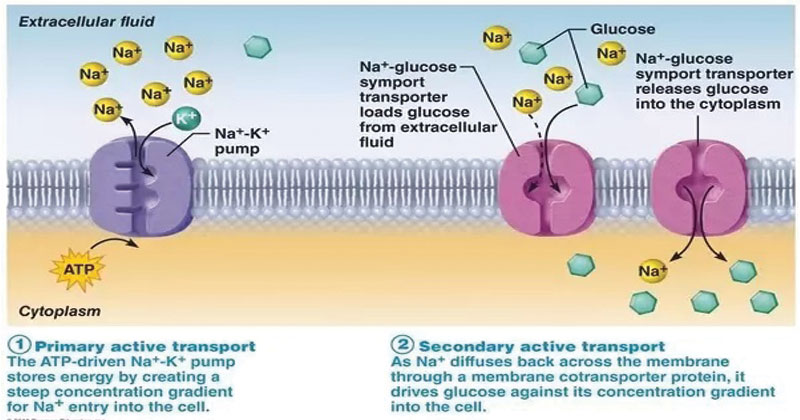
1. Isotonic
2. Hypotonic
3. Hypertonic
4. Osmoregulation
5. Water Balance of Cells with Walls



1. Hypotonic (turgid)
2. Isotonic (flaccid)
3. Hypertonic (plasmolysis)
4. Facilitated Diffusion: Passive Transport Aided by Proteins
5. Facilitated diffusion
6. Ion channels

ACTIVE TRANSPORT USES ENERGY TO MOVE SOLUTES AGAINST THEIR GRADIENTS

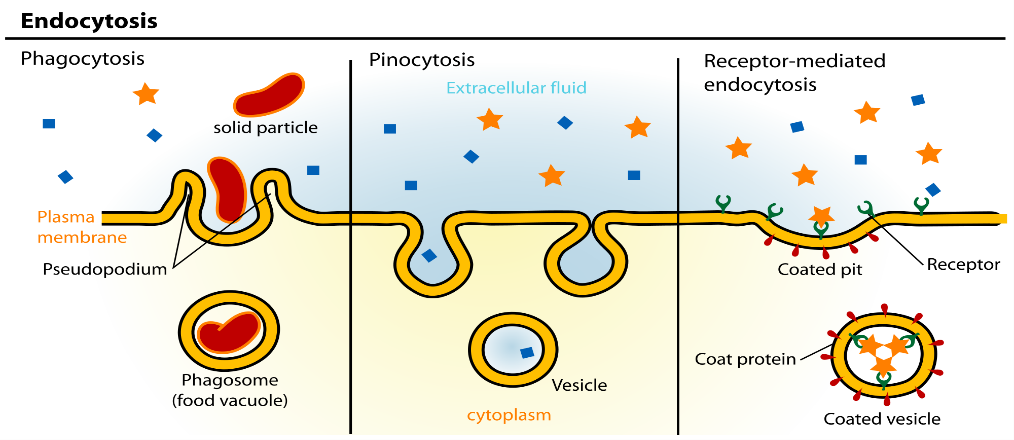
1. The Need for energy in Active Transport



1. How Ion Pumps Maintain Membrane Potential
2. Membrane Potential
3. Electrochemical gradient
4. Electrogenic pump
5. Cotransport: Coupled Transport by a Membrane Protein

BULK TRANSPORT ACROSS THE PLASMA MEMBRANE OCCURS BY EXOCYTOSIS AND ENDOCYTOSIS

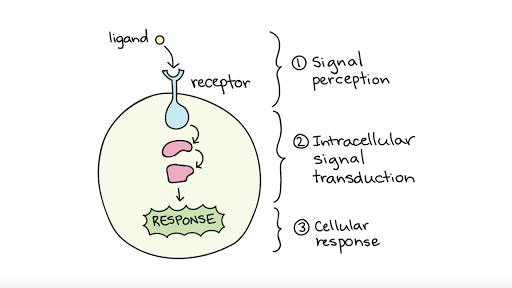
1. Exocytosis
2. Endocytosis



1. Phagocytosis
2. Pinocytosis
3. Receptor Mediated

THE PLASMA MEMBRANE PLAYS A KEY ROLE IN MOST CELL SIGNALING

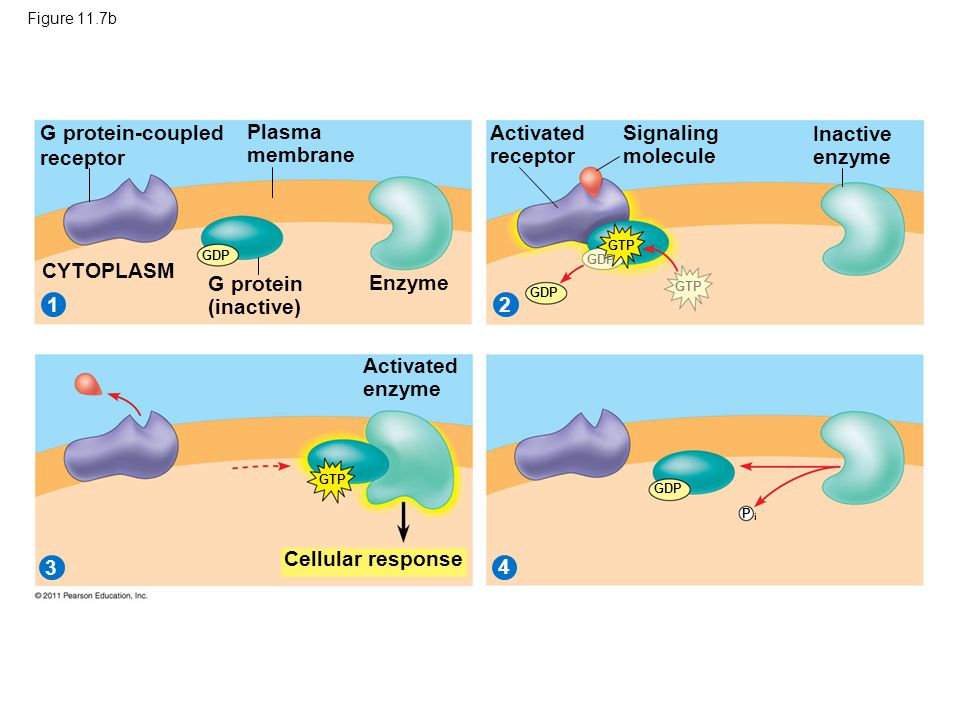
1. Local and Long Distance Signaling
2. Local
3. Long Distance
4. The Three Stages of Cell Signaling: A Preview

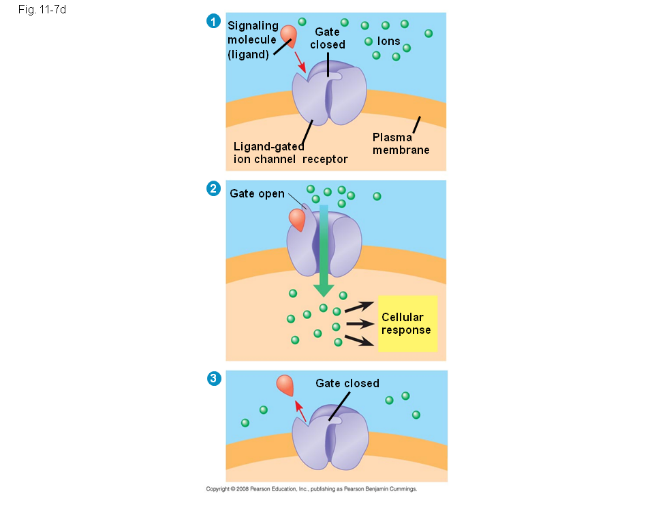


1. Reception, the Binding of a Signaling Molecule to a Receptor Protein

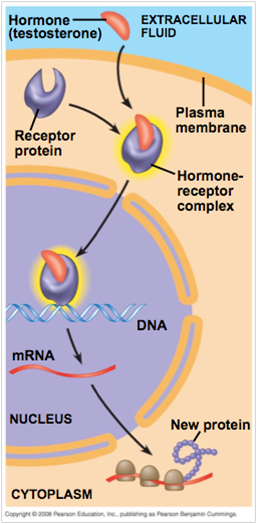
Ligand

1. Receptors in the Plasma Membrane

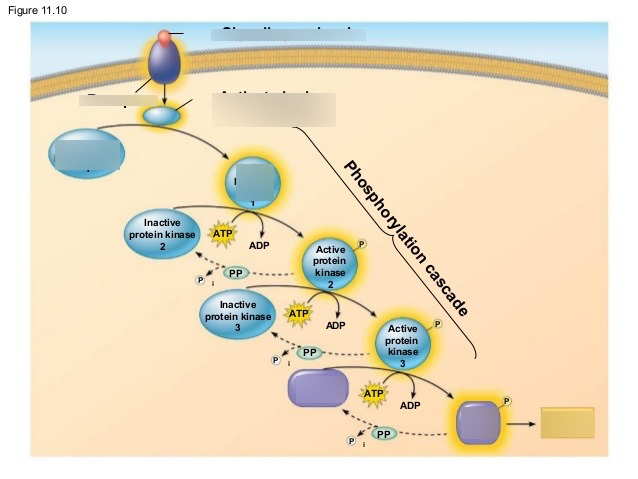




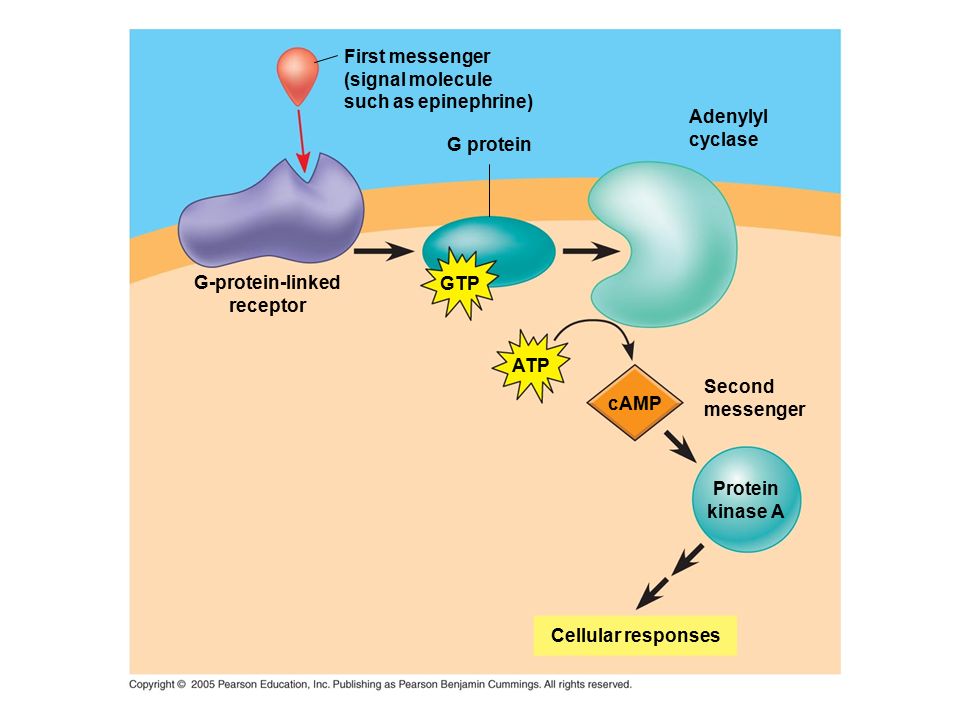
1. Intracellular receptors



1. Transduction by Cascades of Molecular Interactions
2. Protein Phosphorylation and Dephosphorylation



1. Small Molecules and Ions as Second Messengers



1. Response: Regulation of Transcription or Cytoplasmic Activities