

GENERAL BOTANY Lecture 8 - Cell membranes & transport - major tissues

- I. Purpose of membranes - cellular and organelle
 - A. Continuum of systems - nucleus and endoplasmic reticulum
 - 1. "Flow of metabolites"
 - B. Isolation - mitochondrion cannot fuse with nucleus
 - 2. "Independent recognition sites"
 - C. Passage of metabolites
 - 1. Diffusion - from high concentration to low concentration
 - 2. Osmosis - movement of water through a differentially permeable membrane
 - a) From high concentration to low concentration
 - b) Selectivity - active transport
 - 3. Carrier systems
 - a) Chloroplast
 - 1) H^+ pumped into thylakoid lumen
 - 2) H^+ then transported to outer stroma and coupled to make ATP
 - b) Mitochondrion
 - 1) H^+ pumped out to intermembrane space
 - 2) H^+ then transported to inner matrix and coupled to make ATP
- II. How is specific transport accomplished?
 - A. Biological membranes
 - 1. Recognition of ions
 - 2. What recognizes the ions?
 - a) Proteins in the membrane - maybe enzymes
 - 1) Carrier theory
 - 2) Ion pump (ATPase)
 - 3. Model of a membrane - Fluid mosaic model
 - a) Lipid bilayer - phospholipids (cholesterol)
 - b) Proteins
 - 1) Peripheral - surface (in and out)
 - 2) Integral - usually through (sometimes partially)
- III. Types of transport
 - A. Within cells
 - B. Between cells
- IV. Transport in vascular tissue
 - A. Passive transport - mass flow - little or no metabolic involvement
 - 1. Apoplast (dead)
 - a) Xylem (tracheids & vessels)
 - b) Up - diffusion - adhesion (sticking of unlike) & cohesion (sticking of like)
 - B. Active transport - selective transport (ENERGY) - metabolic involvement
 - 1. Symplast (living)
 - a) Phloem (sieve cells)
 - b) Down - osmosis