

Plant Cells
Chapters 2 and 3

Chapter 2
Review of Organic Molecules

- organic molecules
- four major types in living organisms
 - carbohydrates
 - lipids
 - proteins
 - nucleic acids

Carbohydrates

- sugars
- most hydrophilic
- function?

- monosaccharides
- disaccharides
- polysaccharides

Lipids

- fats and fatlike substances
- hydrophobic
- function?

- fats and oils
 - triglycerides
 - energy storage in seeds and fruits
 - tend to be unsaturated
- phospholipids
- barriers to water loss
 - cutin
 - suberin
 - waxes
- steroids
 - cell membranes
 - hormones

Proteins

- polymers of amino acids
- function?
-
- protein structure
- enzymes
 - catalysts

Nucleic Acids

- chains of nucleotides
- DNA, RNA
- function?
-
- ATP
 - modified nucleotide

Secondary Metabolites

- primary metabolites
- secondary metabolites
-
- alkaloids
 - morphine
 - cocaine
 - caffeine
 - nicotine
- terpenoids
 - isoprene
 - essential oils
 - taxol
 - rubber
 - cardiac glycosides
- phenolics
 - flavonoids
 - tannins
 - lignins
 - salicylic acid

Organic Molecules Summary

- Carbohydrates
- Lipids
- Proteins

- Nucleic acids
- Secondary metabolites

The Plant Cell and the Cell Cycle Chapter 3

The Cell

- all cells contain
 - plasma membrane
 - genetic material
- prokaryotic vs. eukaryotic cells

The Plant Cell

- cytoplasm
 - cytoplasmic streaming or cyclosis
- plasma membrane
 - function?
-
- nucleus
 - function?
 -
 - chromosomes
 - haploid
 - diploid
- plastids
 - structure
 - thylakoids
 - stroma
 - own DNA and ribosomes
 - double membrane
 - divide by fission
 - chloroplasts
 - chromoplasts
 - leucoplasts
 - proplastids
- mitochondria
 - own DNA and ribosomes
 - double membrane
 - divide by fission
 - sites of cellular respiration
- remember endosymbiosis...

- vacuoles
 - membrane-bounded region filled with liquid (cell sap)
 - may be 90% cell volume in mature cells
 - function
-
- other parts of the cell
 - endomembrane system
 - peroxisomes
 - ribosomes
 - oil bodies
 - cytoskeleton
- flagella and cilia
 - flagella found in gametes of plants with motile sperm
 - mosses
 - liverworts
 - ferns
 - cycads
 - gingko
- cell wall
 - cellulose
 - framework interpenetrated by matrix of noncellulosic materials
 - lignin
 - cutin, suberin, and waxes
 - secondary wall
 - some cells
 - more cellulose than in primary
 - middle lamella
 - pit-fields and pits
- plasmodesmata
 - cytoplasmic strands connecting adjacent cells
- The cell cycle
 - Interphase
 - Mitosis
 - Cytokinesis
 - Formation of phragmoplast and cell plate

Summary

- four types of organic molecules
 - carbohydrates
 - lipids
 - proteins

- nucleic acids
- secondary metabolites
- plant cell
 - same components as animal cells (with some variations) plus
 - plastids
 - vacuole
 - cell wall
 - See Summary Table p. 68 (very detailed)