

## Cell Structures Study Guide

The following terms should be part of your vocabulary and you should not need a dictionary to use them properly. You should understand how each of these structures contributes to the form and function of a cell.

Letters in **red** indicate typically found only in animal cells and letters in **green** indicates typically found only in plants.

- nucleus
  - nuclear membrane
  - nucleolus
- **cell wall (only in plants)**
  
- plasma membrane - the membrane at the outer cell surface
  - cell junctions (structures that join cells to other cells)
    - **tight (occluding) junctions**
    - **gap (communicating) junctions**
  - microvilli**
  - cilia (some plants have cilia and flagella, but it is a rare thing)**
- cytosol (everything outside the nucleus and inside the plasma membrane)
- inclusions
  - pigment granules
  - lipid droplets
  - glycogen granules
- membranous organelles (organelles surrounded by or made of membranes)
  - mitochondria
  - plastids (only in plants)...lipoplasts, proteinoplasts, amyloplasts and chloroplasts**
  - rough endoplasmic reticulum
  - smooth endoplasmic reticulum
  - Golgi apparatus (sometimes called dictyosomes in plants)
  - vesicles...various small bodies enclosed by a membrane

- transport vesicles...used to move products of cells
- secretory vesicles...when a vesicle leaves a cell
- lysosomes, phagosomes - digestive vesicle
- peroxisomes (microbodies) - vesicle containing peroxides
- organelles without membranes
  - ribosomes - protein translation machinery
  - cytoskeleton - various tiny filaments that give the cell its structural integrity and ability to move.
- microfilaments
  - intermediate filaments
  - actin filaments
- microtubules
- mitotic spindle
- centriole (absent in flowering plants) / basal body

Organelle	Main function	Structure	Organisms	Notes
chloroplast (plastid)	photosynthesis, traps energy from sunlight	double-membrane compartment	plants, protists (rare kleptoplastic organisms)	has some genes; theorized to be engulfed by the ancestral eukaryotic cell (endosymbiosis)
endoplasmic reticulum	translation and folding of new proteins (rough endoplasmic reticulum), expression of lipids (smooth endoplasmic reticulum)	single-membrane compartment	all eukaryotes	rough endoplasmic reticulum is covered with ribosomes, has folds that are flat sacs; smooth endoplasmic reticulum has folds that are tubular
Golgi apparatus	sorting, packaging, processing and modification of proteins	single-membrane compartment	all eukaryotes	cis-face (convex) nearest to rough endoplasmic reticulum; trans-face (concave) farthest from rough endoplasmic reticulum
mitochondria	energy production from the oxidation of glucose substances and the release of adenosine triphosphate	double-membrane compartment	most eukaryotes	has some DNA; theorized to be engulfed by an ancestral eukaryotic cell (endosymbiosis)
vacuole	storage, transportation, helps maintain homeostasis	single-membrane compartment	eukaryotes	
nucleus	DNA maintenance, controls all activities of the cell, RNA transcription	double-membrane compartment	all eukaryotes	contains most of genome... some genes on mitochondria and chloroplasts