

### Cell Theory Recap

- All living things are made up of cells.
- Cells are the smallest working units of all living things.
- All cells come from preexisting cells through cell division.

### Definition of Cell

A cell is the smallest unit that is capable of performing life functions.

### Examples of Cells

A collage of five different cell types, each with a label in a blue box pointing to the image: Amoeba Proteus (a single-celled organism with multiple flagella), Plant Stem (a cross-section of a plant stem showing vascular bundles), Bacteria (a cluster of rod-shaped cells), Nerve Cell (a long, branching cell with a cell body and axons), and Red Blood Cell (a biconcave, disc-shaped cell).

### Two Types of Cells

- Prokaryotic
- Eukaryotic

### Prokaryotic Recap

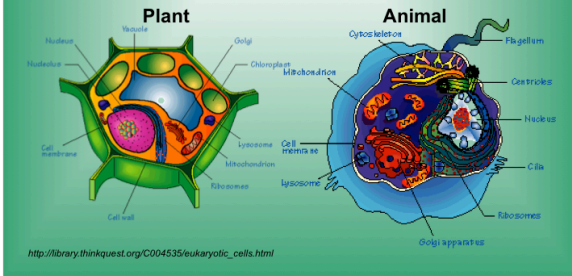
- Do not have structures surrounded by membranes
- Few internal structures
- One-celled organisms, Bacteria

A diagram of a prokaryotic cell, likely a bacterium. It is an oval-shaped cell with a thick outer layer labeled "Cell wall" and a thinner inner layer labeled "Cell membrane". Small red dots inside represent "Ribosomes". A large, irregularly shaped region in the center is labeled "Nucleoid (DNA)". Hair-like structures extending from the cell are labeled "Flagella". A protective outer layer is labeled "Capsule".

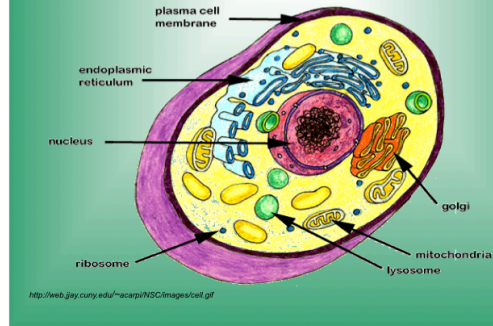
[http://library.thinkquest.org/C004535/prokaryotic\\_cells.html](http://library.thinkquest.org/C004535/prokaryotic_cells.html)

### Eukaryotic Recap

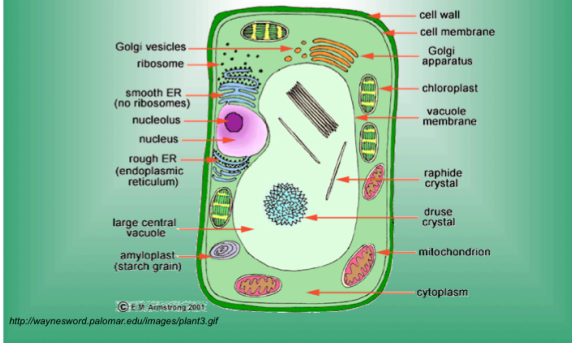
- Contain organelles surrounded by membranes
- Most living organisms



### “Typical” Animal Cell



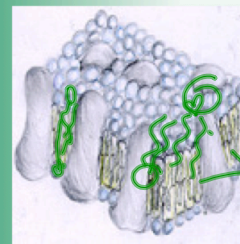
### “Typical” Plant Cell



## Cell Parts Organelles

### Surrounding the Cell

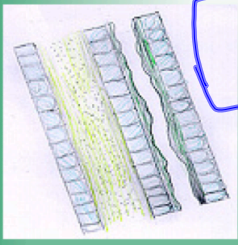
### Cell Membrane



- Outer membrane of cell
- Double layer of fats called lipids “they look like two tailed sperm”
- **Function:** controls movement in and out of the cell

Handwritten notes: *How water* (with an arrow pointing to the membrane), *→ some in*, *not all*, and *Semipermeable*.

### Cell Wall



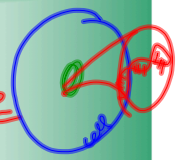
- Most commonly found in plant cells & bacteria
- Function: Supports & protects cells

<http://library.thinkquest.org/12413/structures.html>

### Inside the Cell

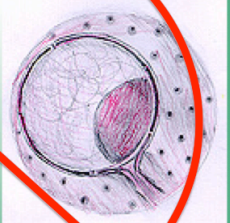
### Nucleus

*Eukaryote*



- **Function:** Directs cell activities
- Separated from cytoplasm by nuclear membrane
- Contains genetic material - DNA

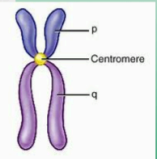

### Nuclear Membrane



- Surrounds nucleus
- Made of two layers
- **Function:** Openings allow material to enter and leave nucleus

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### Chromosomes



- In nucleus
- Made of DNA
- **Function:** Contain instructions for traits & characteristics

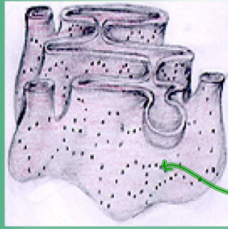
*XX* *XY*

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### Cytoplasm

- Gel-like mixture
- Surrounded by cell membrane
- Contains hereditary material

## Endoplasmic Reticulum



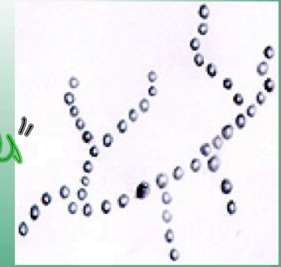
- **Function:** Moves materials around in cell
- **Types:**
  - Smooth type: lacks ribosomes
  - Rough type (pictured): ribosomes embedded in surface

<http://library.thinkquest.org/12413/structures.html>

## Ribosomes

- Each cell contains thousands
- **Function:** Make proteins

*Protein makes up cells*



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## Mitochondria

- **Function:** Produces energy through chemical reactions – breaking down fats & carbohydrates

*ATP cell energy*



Fig. 1. A mitochondrion, one of the "intracellular powerhouses" found in every cell of the body.

<http://www.khanacademy.org/a/energy-in-a-cell>

## Golgi Bodies

- **Function:** Protein 'packaging plant'
  - Move materials within the cell
  - Move materials out of the cell

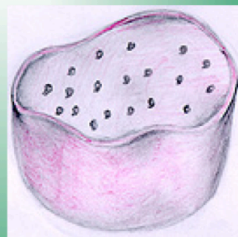
*"THIS IS THE UPS STORE"*



<http://library.thinkquest.org/12413/structures.html>

## Lysosome

- **Function:** Digestive 'plant' for proteins, fats, and carbohydrates
  - Transports undigested material to cell membrane for removal
  - Cell breaks down if lysosome explodes

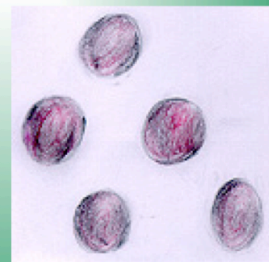


<http://library.thinkquest.org/12413/structures.html>

*STAY IN A*

## Vacuoles

- **Function:** Membrane-bound sacs for storage, digestion, and waste removal
- Contains water solution
- Help plants maintain shape



<http://library.thinkquest.org/12413/structures.html>

## Chloroplast

- Usually found in plant cells
- Contains green chlorophyll
- **Function:** Where photosynthesis takes place



<http://library.thinkquest.org/12413/structures.html>