

THE CELL

Review of Cell Theory
Pro- and Eukaryotes
Organelles

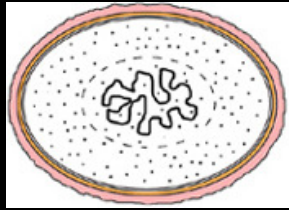
Review of Cell Theory

- Principles of cell theory:
 1. All living things are made of cells.
 2. Cells carry out the functions needed to support life.
 3. Cells come only from other living cells.

Review of Cell Theory

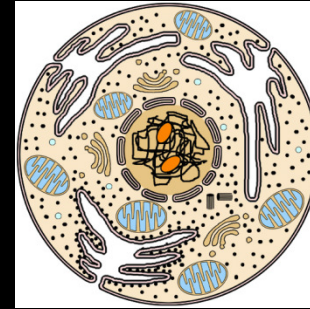
- Contributing scientists
 - Anton von Leeuwenhoek: Invented the microscope and observed tiny living things in water
 - Robert Hooke: Coined the term “cell” after observing that cork consisted of tiny chambers
 - Francesco Redi: Proved that living things cannot be produced from non-living matter
 - Louis Pasteur: Discovered that cells come only from other living cells

Two Types of Cells



Prokaryotes

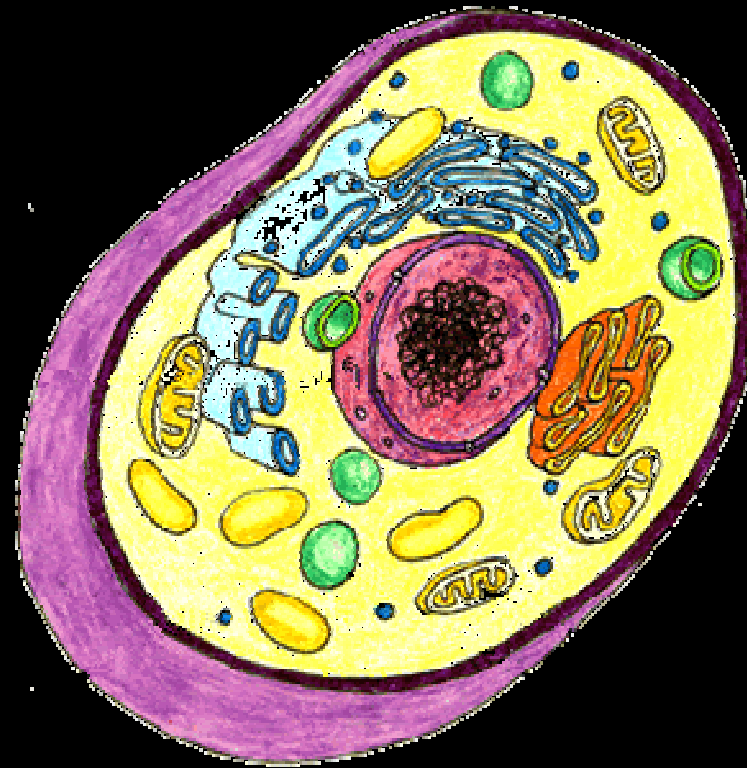
- First cells to evolve
- No nucleus
- Hereditary info is contained within cytoplasm
- Ex: Archaea, Bacteria



Eukaryotes

- Evolved from prokaryotes
- Have a nucleus
- Hereditary info is contained within the nucleus
- Ex: Animals, Protists, Fungi, Plants

And now for....



THE CELL ORGANELLES

TINY MEMBRANE-BOUND STRUCTURES THAT PERFORM SPECIAL FUNCTIONS INSIDE THE CELL

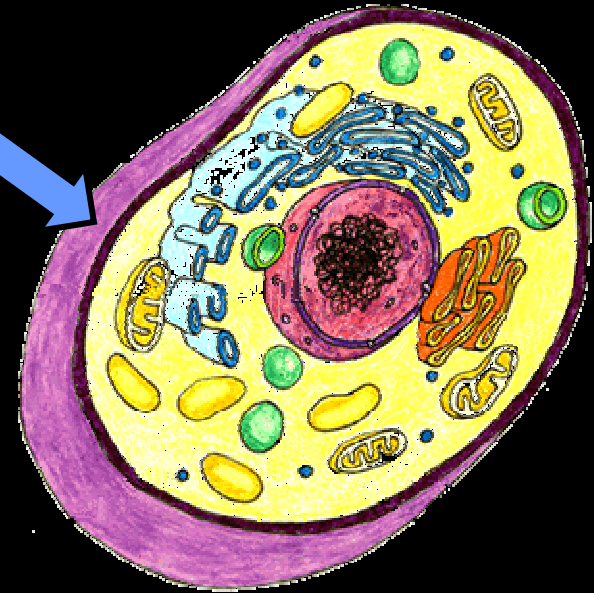
Cell Wall

- Only found surrounding plant, fungal and bacterial cells
- Made of cellulose
- Is rigid, strong and stiff
- Provides support and protection for the cell
- It's like the wall that surrounds a medieval city!



Cell Membrane

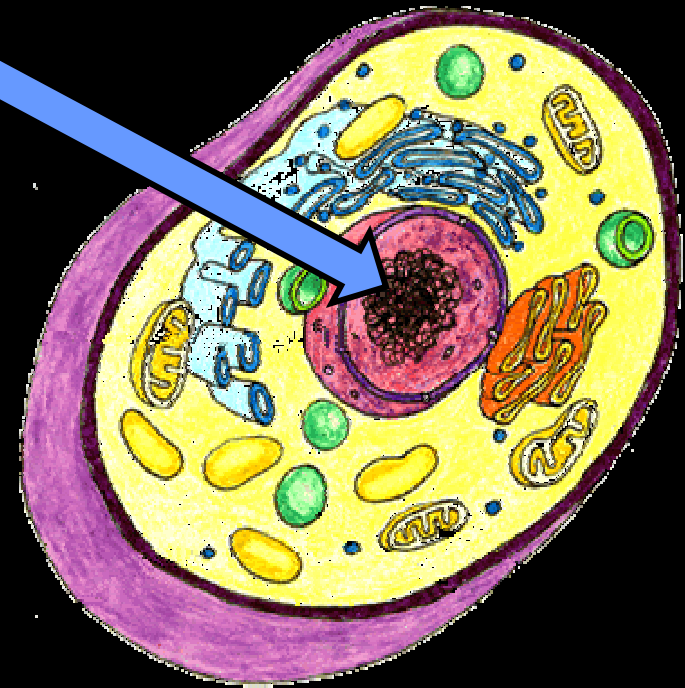
- Surrounds all cells
 - In a plant cell, it lies beneath the cell wall
 - In animal cells, it is the outer boundary (made of cholesterol)
- Provides cell with
 - Protection
 - Control of movement of materials in/out of cell
 - Support
 - Maintains condition of cell



- It's like the border of a city!

Nucleus

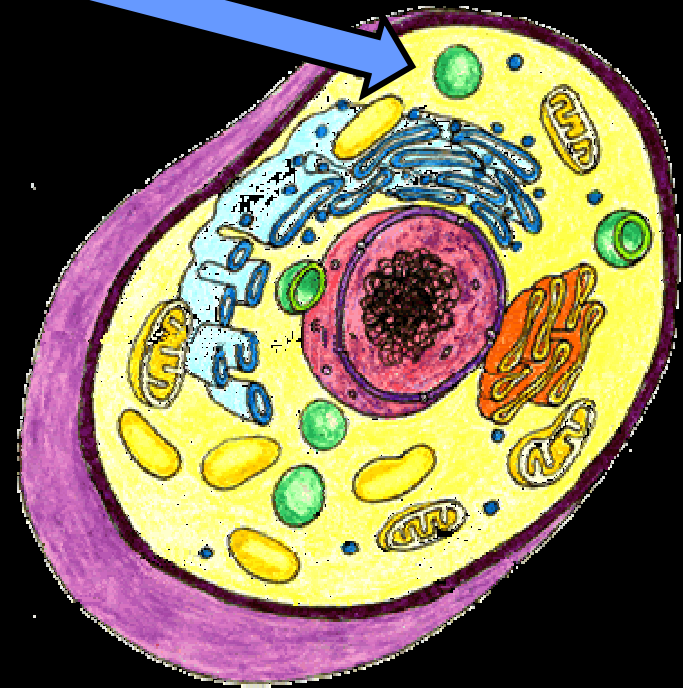
- Identified in 1833 by Robert Brown
- Found in both plant and animal cells
- Large, oval shape
- Centrally located in cell
- Controls cell activities
- Contains genetic information (DNA)



- It's like the Mayor's Office in City Hall!

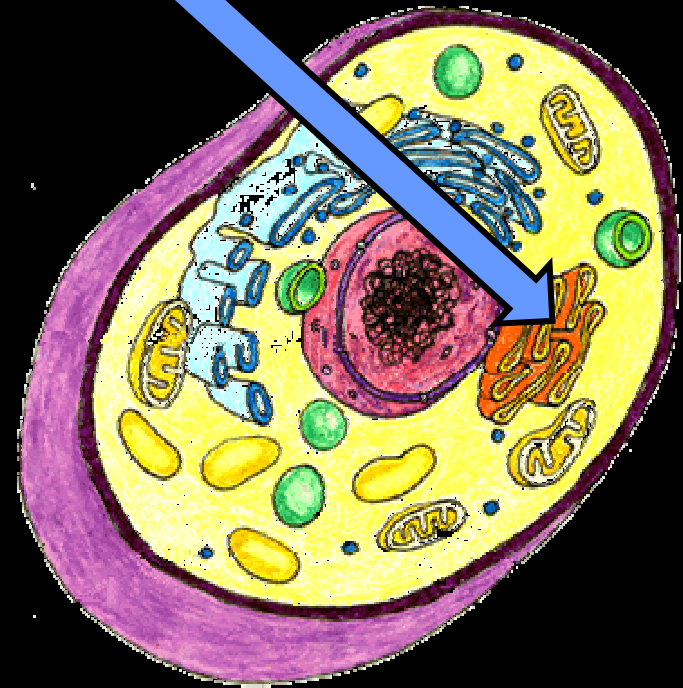
Cytoplasm

- Found in both plant and animal cells
- Clear, thick, jelly-like material
- Located beneath cell membrane
- Supports and protects cell organelles
- It's like the sidewalks that are found throughout a city!



Golgi Apparatus

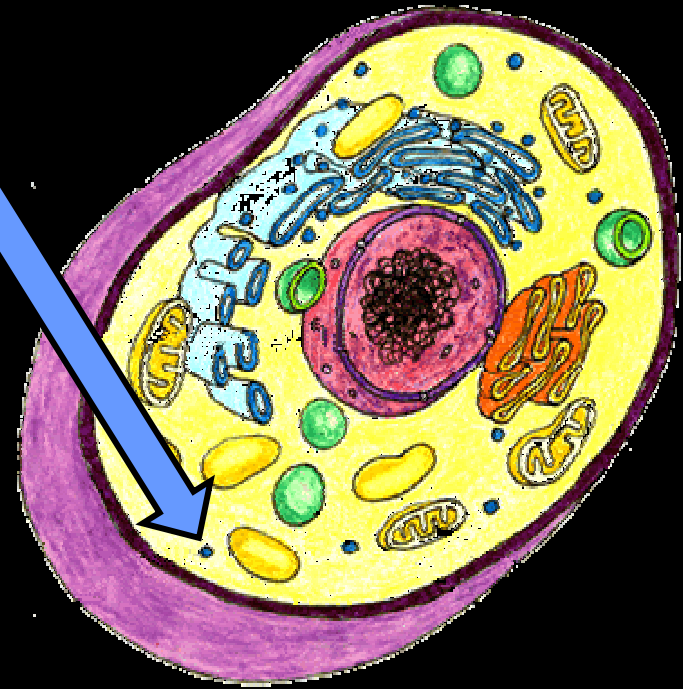
- Discovered in 1898 by Camillo Golgi
- Found in both plant and animal cells
- Looks like a flattened stack of membranes (or pancakes!)
- Processes and packages molecules, like lipids and proteins, that were made by the cell



- It's like a city's Post Office or UPS center!

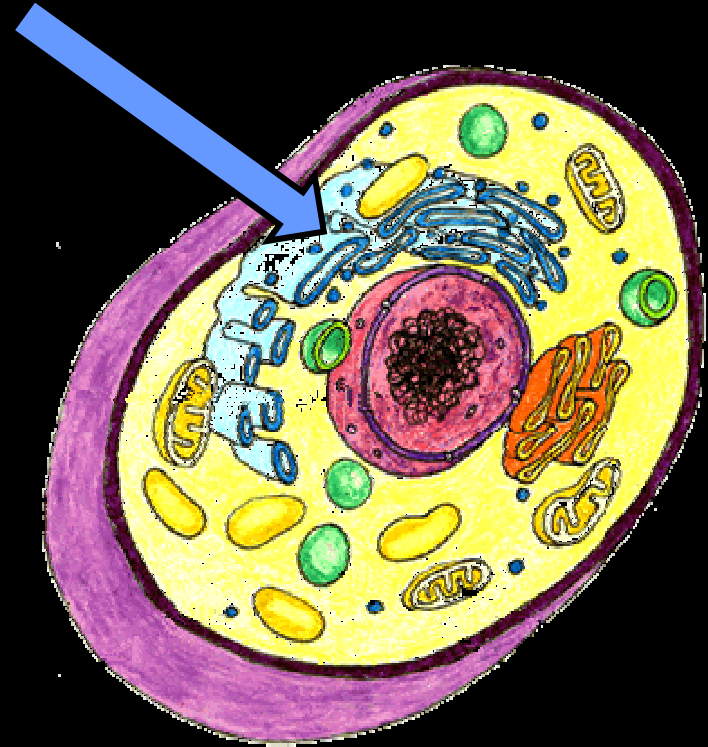
Ribosomes

- Found in both plant and animal cells
- Can be attached to the Endoplasmic Membrane or floating free in the cytoplasm
- Produces proteins
- The smallest organelles
- It's like the brick yard that supplies a city with what it's made of!



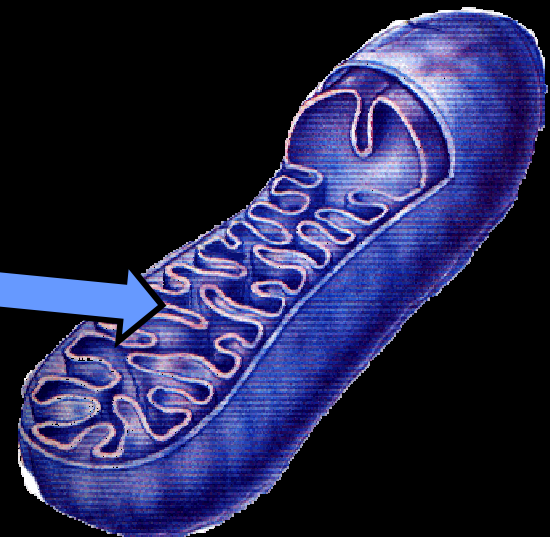
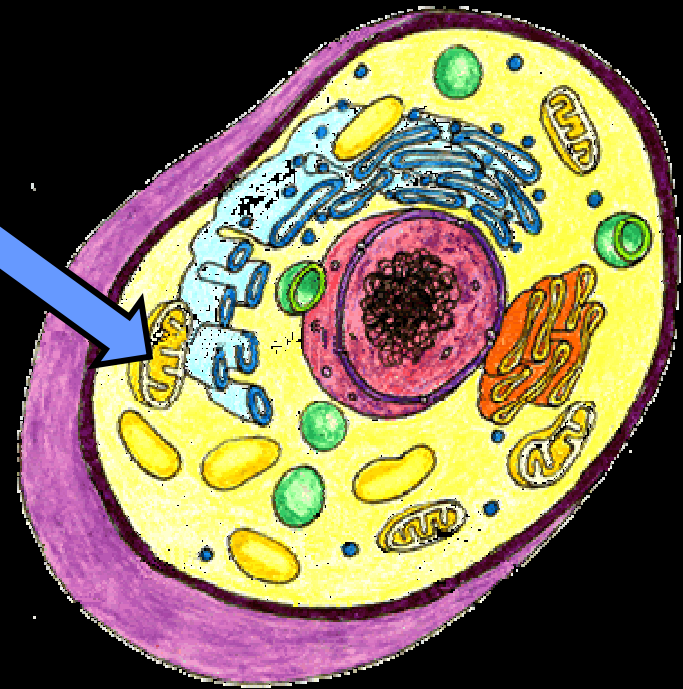
Endoplasmic Reticulum

- Found in both plant and animal cells
- Network of tubes
- Transports materials throughout the cell
- Two types
 - Smooth (no ribosomes)
 - Rough (covered with ribosomes)
- It's like a city's highway system!



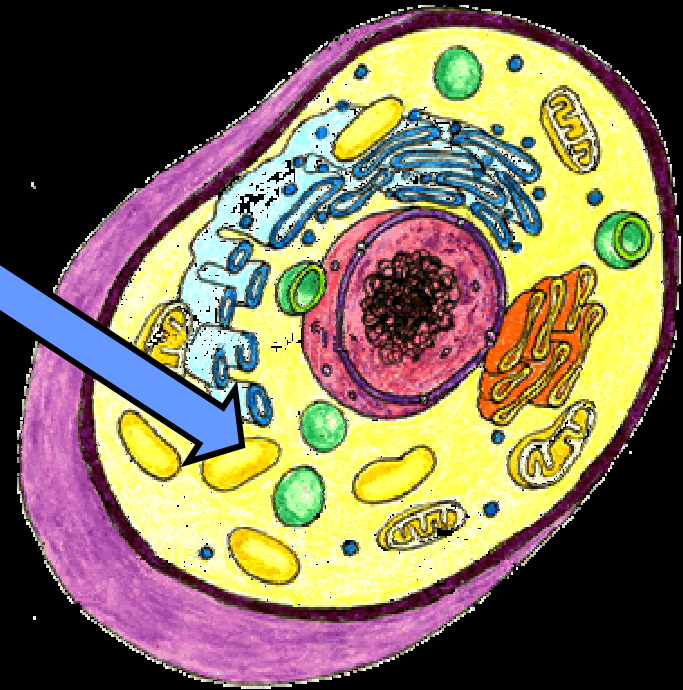
Mitochondria

- Found in both plant and animal cells
- Looks like a jellybean
- Breaks down sugar molecules to release usable energy
- Has inner foldings (**Cristae**) that increase the internal surface area
- It's like a city's power plant!



Vacuoles

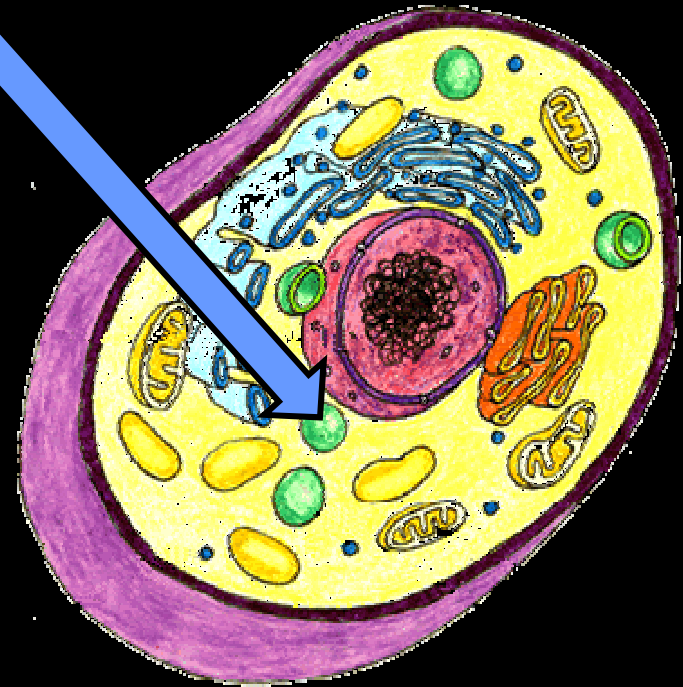
- Found in both plant and animal cells
 - In plant cells: very few and very large
 - In animal cells: many little ones
- Fluid-filled sacs
- Store food, water and waste



- It's like a city's warehouses, water towers and garbage dumps!

Lysosomes

- Found in animal cells only
- Small and round in shape
- Breaks down larger food molecules into smaller ones
- Digests old cell parts
- It's like a city's Recycling Center!



Chloroplasts

- Found in plant cells only
- Oval-shaped
- Green in color due to chlorophyll
- Uses energy from the sun to make food for the plant
- It's like the solar panels on a city's buildings!

