Eukaryotic Cells: The Inside Story

Day 1

Objective

1. I will describe each part of a eukaryotic.
2. I will explain the function of each part of a eukaryotic cell.
3. I will describe the difference between animal cells and plant cells.

New Key Terms

- cell wall
- ribosomes
- endoplasmic reticulum
- mitochondria
- chloroplast
- Golgi complex
- vacuole
- lysosomes

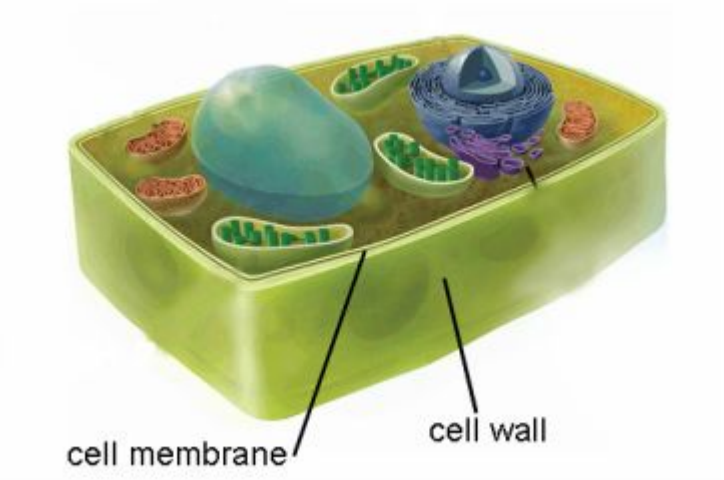
Bellringer

List three difference between prokaryotic and eukaryotic cells.

The Cell Song

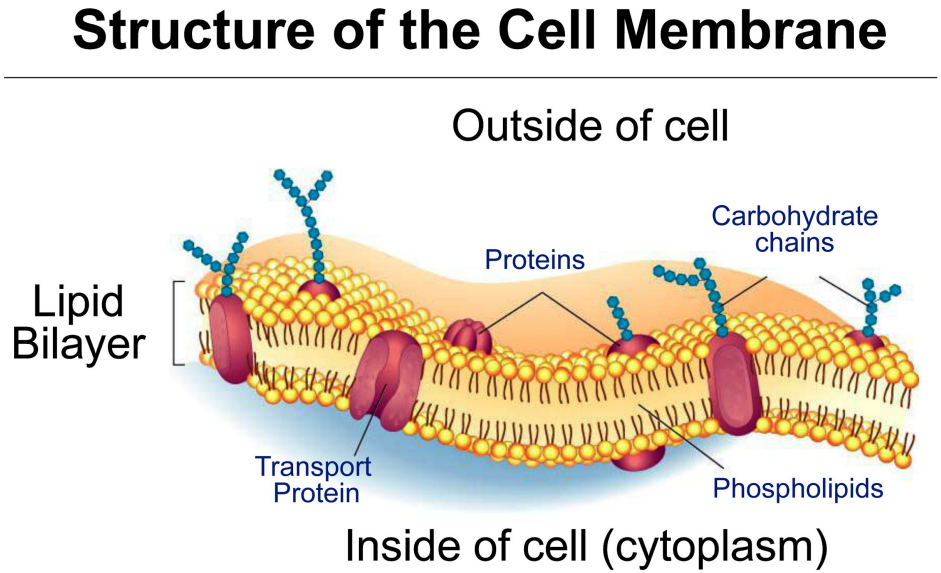
Holding it Together

- Cells have outer coverings that separate what is inside and what is outside
- One kind of covering is called the cell membrane
- Some cells have an extra layer of covering called the cell wall.

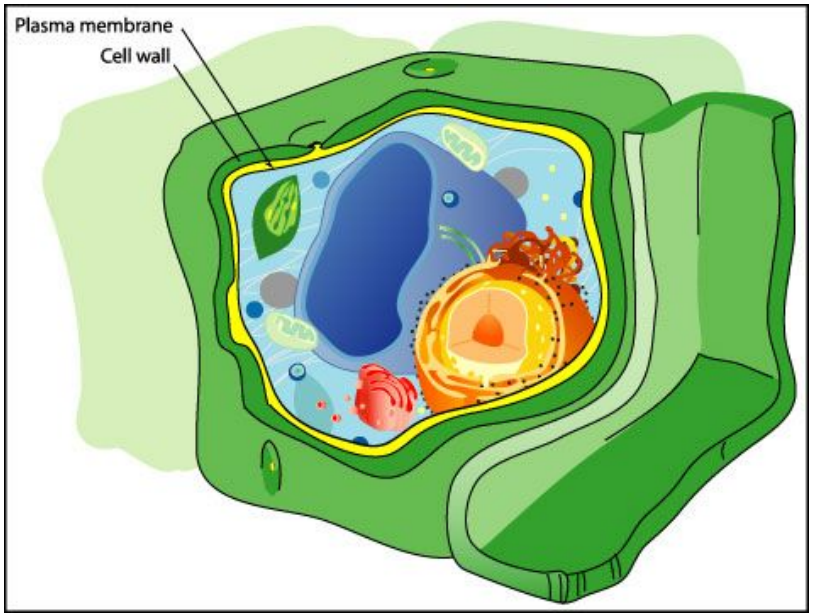


Cell Membrane

- all cells are covered by cell membrane
  - the job of a cell membrane is to keep the cytoplasm inside and allow the nutrient and waste products out and to interact with things outside the cell.
- remember, the cell membrane is made up of phospholipids



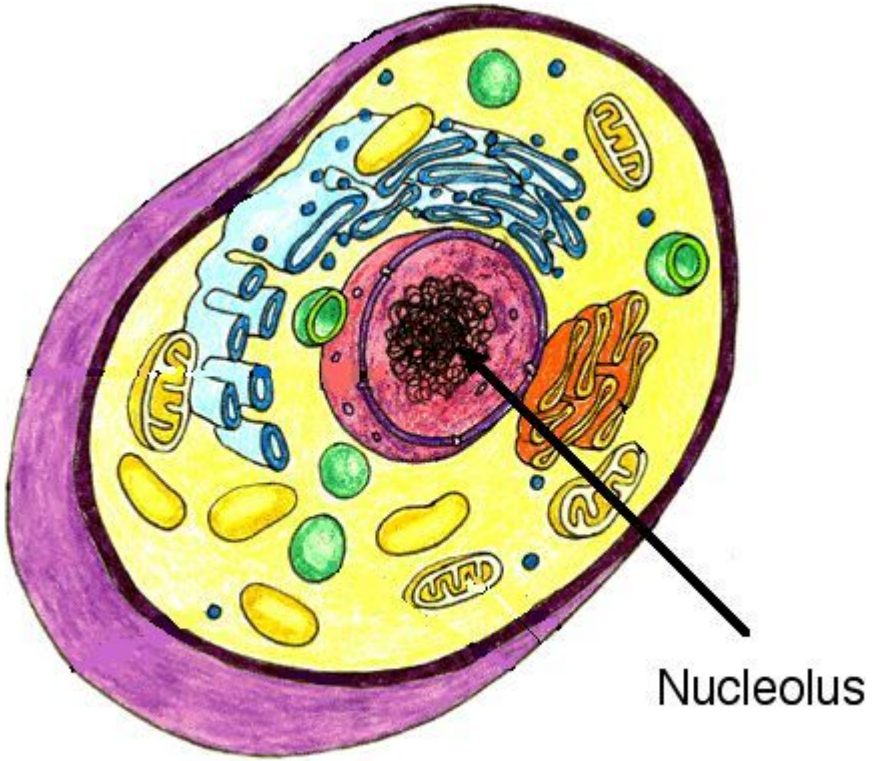
Cell Wall



- plant and algae cells have hard cell walls made of cellulose
- the cell wall provides strength and support to the membrane
- if too much water enters or leaves the cell wall can prevent the membrane from tearing
- the cell of fungi (such as a mushroom) have cell walls made of a chemical similar to that found in hard covering of insects

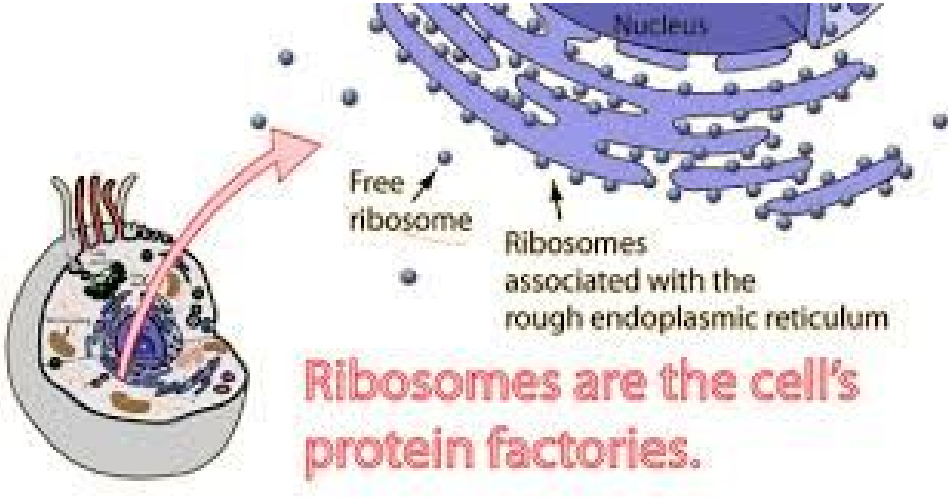
The Cell's Library

- The nucleus is the largest most visible organelle in the eukaryotic cell
- The word nucleus means kernel or nut
- Nucleus is the control center
  - it stores the DNA
- Sometimes dark spots can be seen on the nucleus called nucleolus
  - stores materials that will be used later to make ribosomes
- Almost every chemical reaction that is important to the cell's life involves proteins

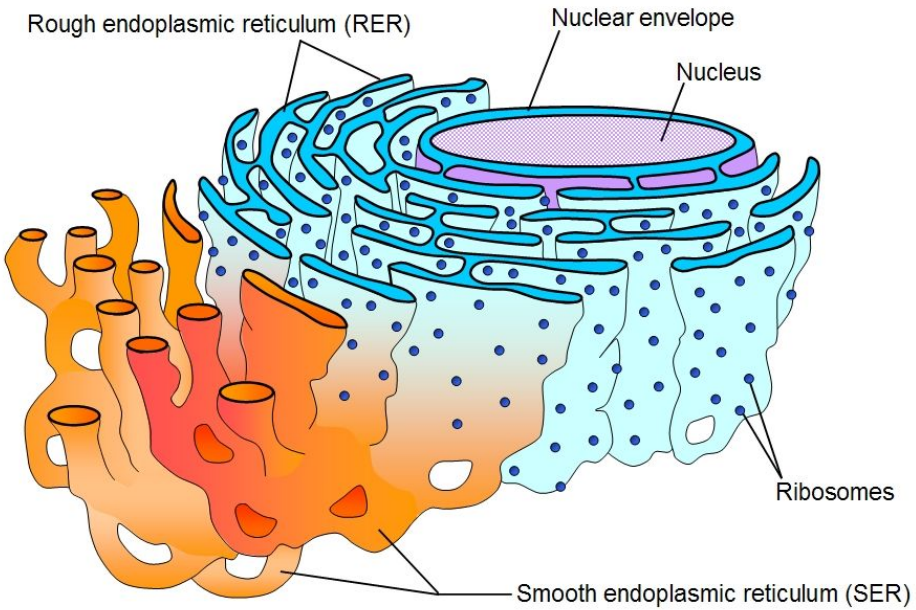


Protein Factories

- Proteins are the building blocks of cells and are made of amino acids
- amino acids are hooked together to make small organelles called ribosomes
- Ribosomes are the smallest but most abundant organelle
- all cell shave ribosomes because all cells need proteins to live
- ribosomes are not covered with a membrane



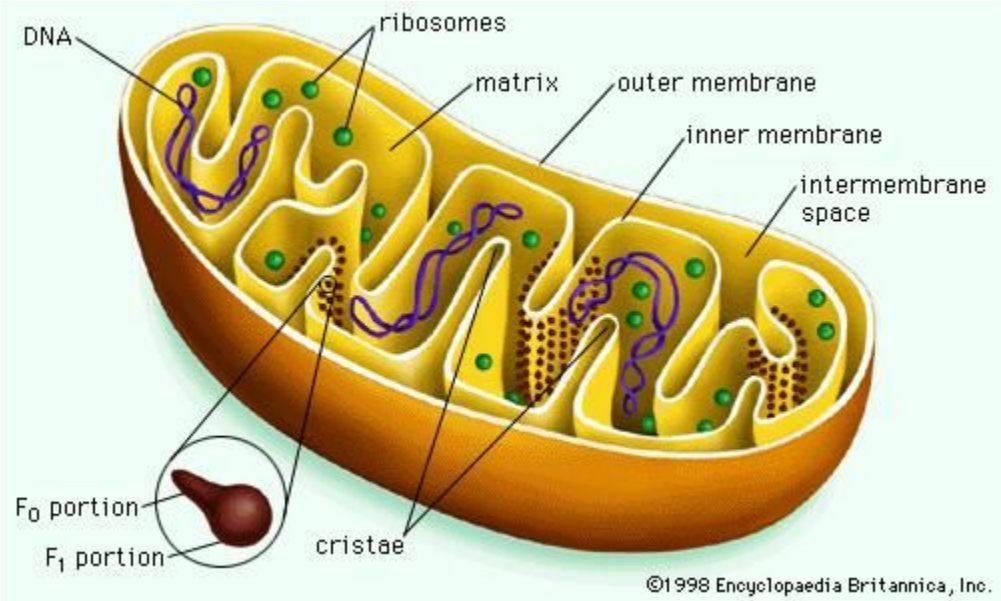
Cell's Delivery System



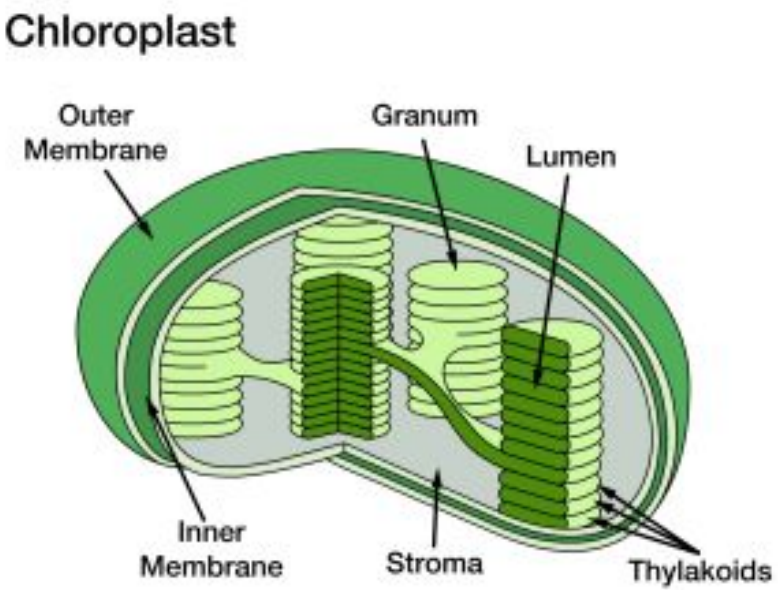
- Eukaryotic cells have an organelle called the endoplasmic reticulum (ER)
  - a membrane covered compartment that makes lipids and other materials for use inside and outside of the cell.
  - breaks down chemicals that can damage the cell'
- ER is the internal delivery system
- substances in the ER can move like cars move in a tunnel
- Looks like flattened sacks folded
- Some ER is covered by ribosomes

The Cell's Power Plants- Mitochondria

- Inside all cells food is burned (broken down) to release energy. This energy is transferred to molecules (ATP) that the cell uses to get work done.
- ATP is primarily made in the mitochondria
    - surrounded by two membranes
        - inner membrane is where most of the ATP is made
- We breathe air to make sure the mitochondria has oxygen to make ATP
- The heart and liver is made of thousands of mitochondria



The Cell's Power Plant-Chloroplast



- Chloroplast is found in plants and algae and is an additional kind of energy converting organelle
  - chloroplast means green structure
- It has two membranes and structures that looks like flattened stack of coins which contain chlorophyll
  - Chlorophyll is what makes chloroplast green
  - makes chloroplast the powerplant
- Photosynthesis
  - the energy from the sunlight is trapped by the chlorophyll and used to make ATP in the mitochondria

Things to Do

- Homework
  - Investigate red blood cells and create a poster (in your notebook) comparing the red blood cells with the cheek skin cell
  - Key Terms- Define all key Terms

- Assessments
  - Key Terms Quiz
    - Thursday
  - Section Test
    - Friday

Eukaryotic Cells: The Inside Story

Day 2

Objective

1. I will describe each part of a eukaryotic.
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New Key Terms

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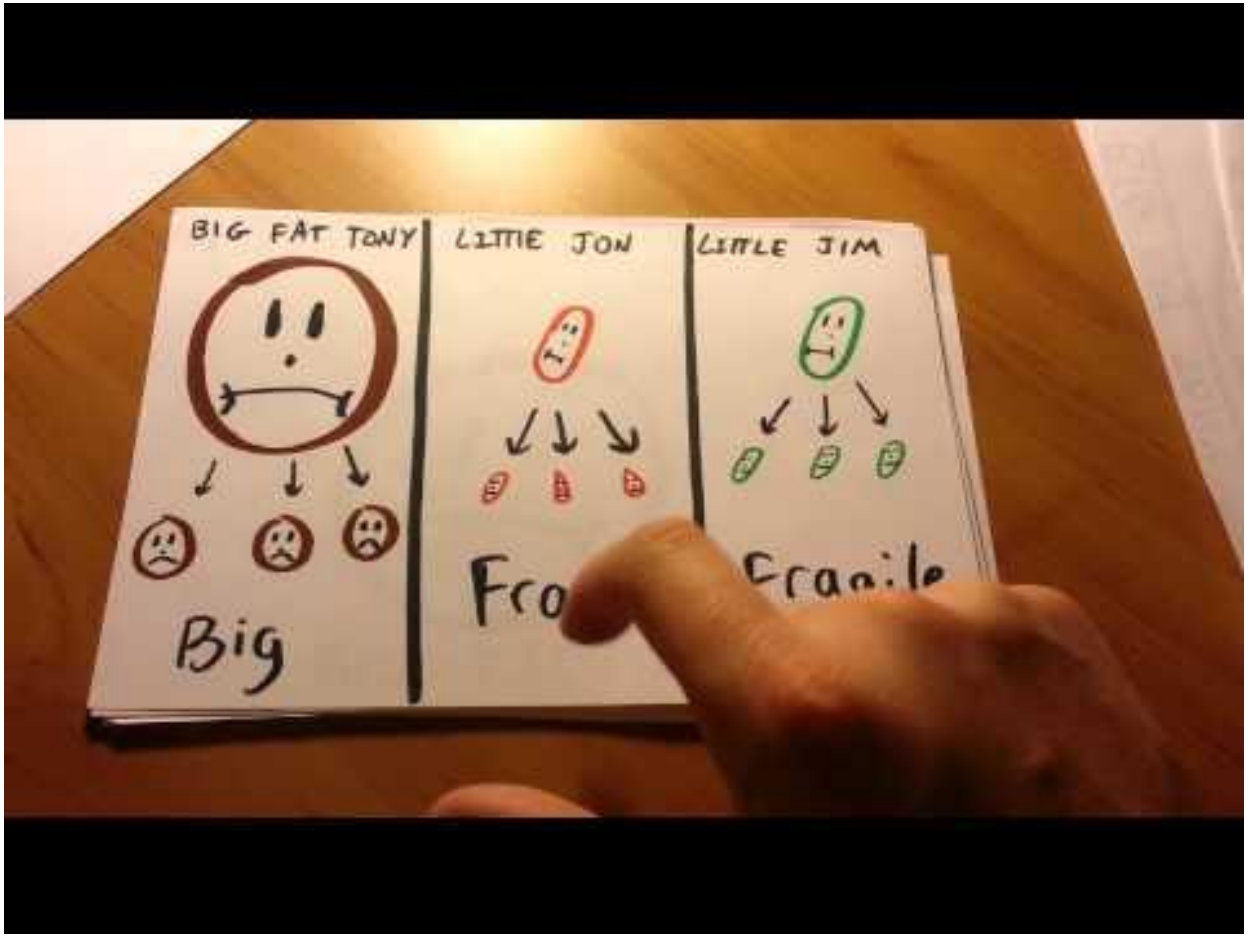
- mitochondria
- chloroplast
- Golgi complex
- vacuole
- lysosomes

Another theory...

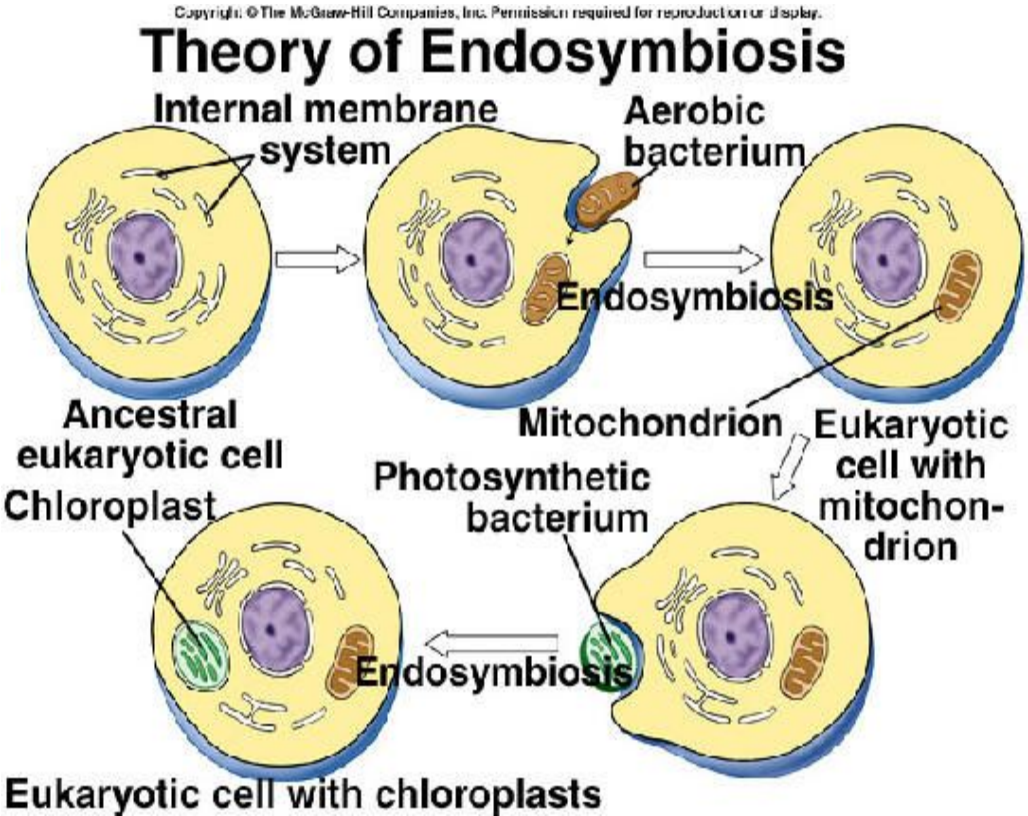


Bellringer

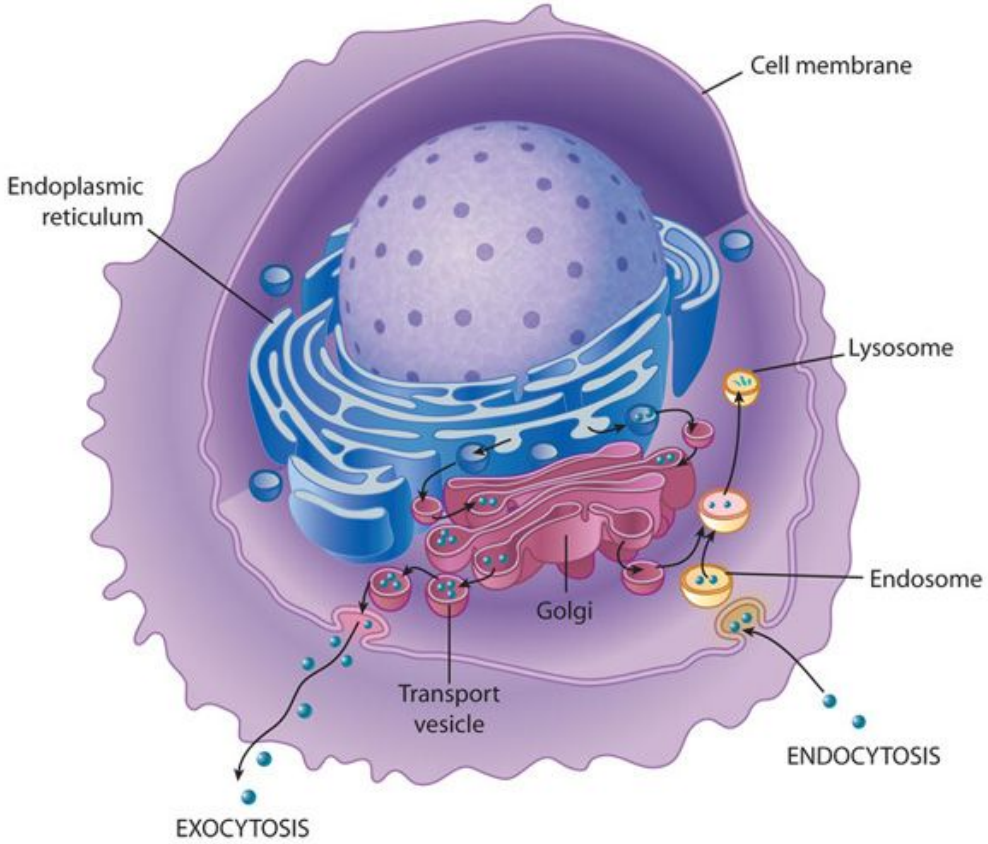
What is the difference between a cell wall and a cell membrane?

The Cell's Power Plant- Endosymbiotic Theory

- Scientist believe mitochondria and chloroplast originated as prokaryotic cells that were eaten by larger cells.
- Evidence
  - 1st- mitochondria and chloroplast about the same size of bacteria
  - 2nd- both are surrounded by two membranes
    - if correct, the second membrane was developed when eaten



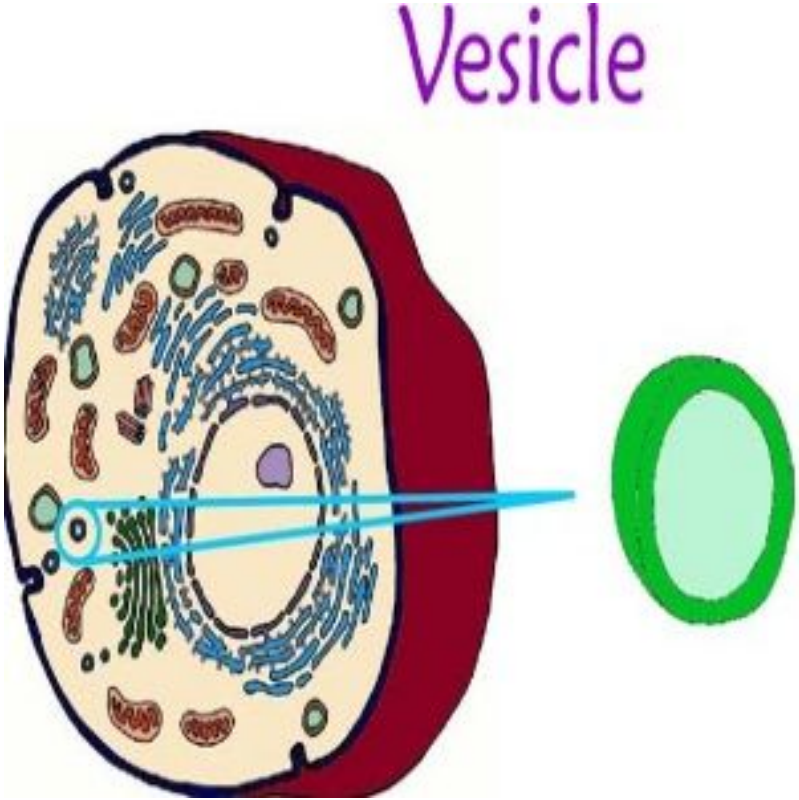
The Cell's Packaging Center



- Golgi complex ships proteins and other materials that needs to be processed and shipped out of the cell
- Looks like the ER but is closer to the membrane
- lipids and proteins from the ER are delivered to the golgi complex where they are modified to different functions
- The final products are enclosed in a piece of the golgi's membrane and sent where it's suppose to go

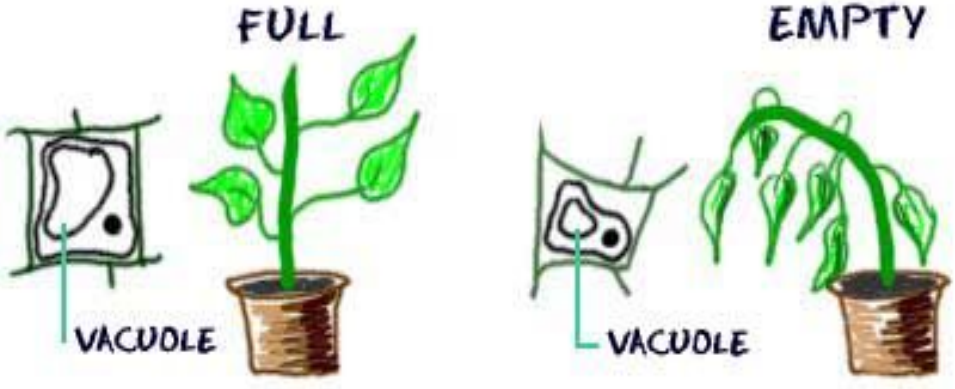
The Cell's Storage Center

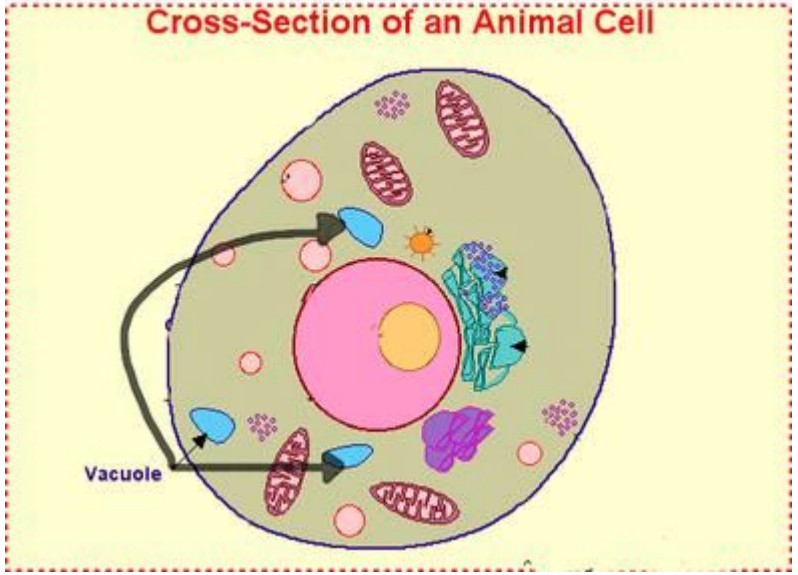
- All Eukaryotic cells have membrane covered compartments called vesicles.
- Some form when parts of the membrane surround an object
- This is how white blood cells engulf other cells in your body



The Cell's Storage Center- Vacuoles

- Large membrane-covered chambers are called vacuoles
  - storage containers for water and other liquids
  - those full of water help support cells
- Leave your lettuce in a bowl of clean water overnight to make sure it's crispy

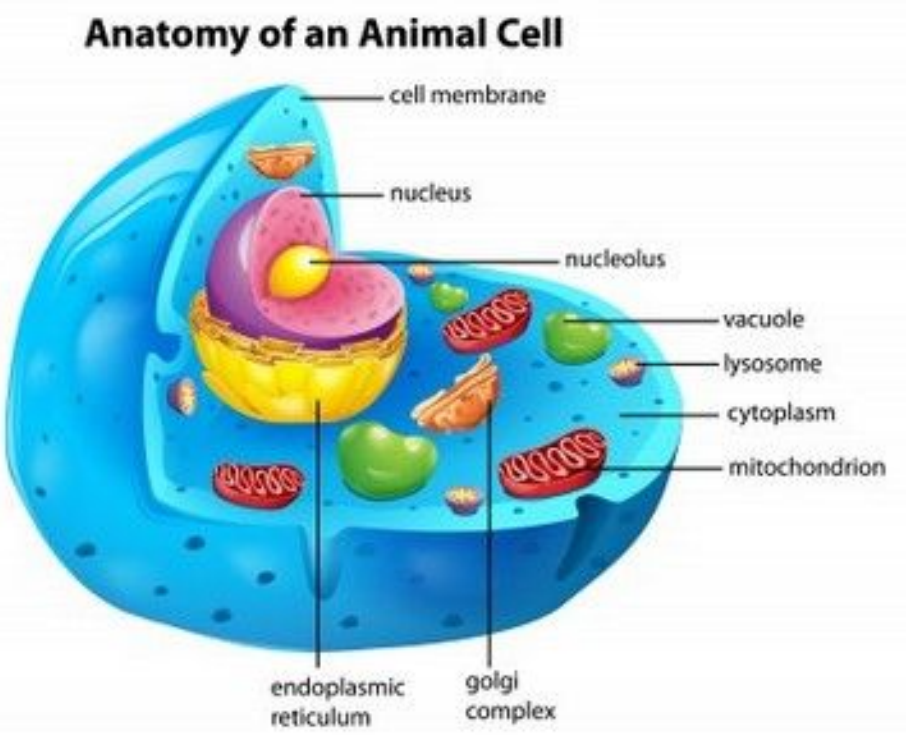


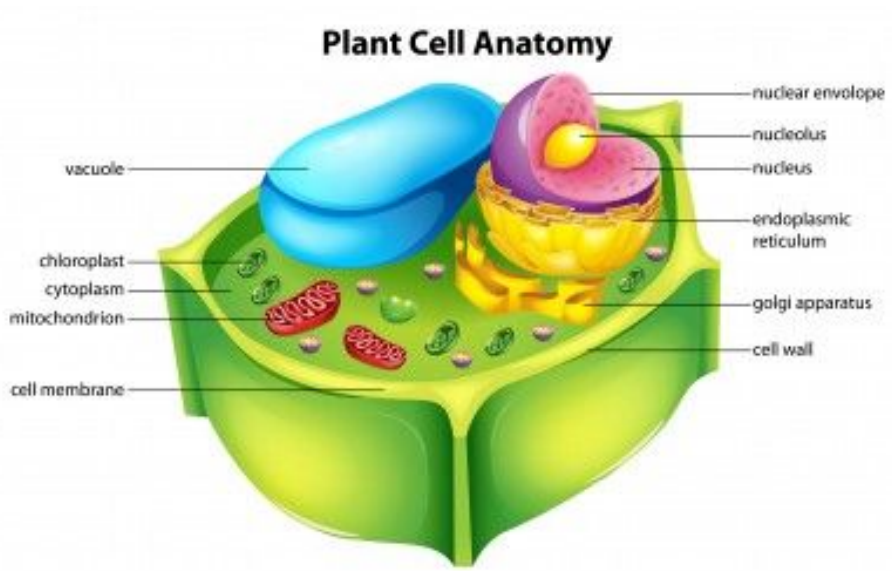


Packages of Destruction

- Lysosomes are special vesicles in animal cells that contain enzymes
- When a cell engulfs a particle and encloses it in a vesicle, lysosomes bump into vesicles and pour enzymes into them. The particles in the vesicle are digested in the by the enzyme
- Lysosomes destroy damaged organelles, get rid of waste material and protect the cell from foreign invaders
- Sometimes the lysosomal membrane break, the enzymes spill & kill the cell.

Plant or Animal?





Copy the Table on p. 98 in Notebook

Things to Do

- Homework
  - Section Review p. 99

- Assessments
  - Key Terms Quiz
    - Thursday
  - Section Test
    - Friday

Eukaryotic Cells: The Inside Story

Day 3

Objective

1. I will describe each part of a eukaryotic.
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New Key Terms

- cell wall
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- mitochondria
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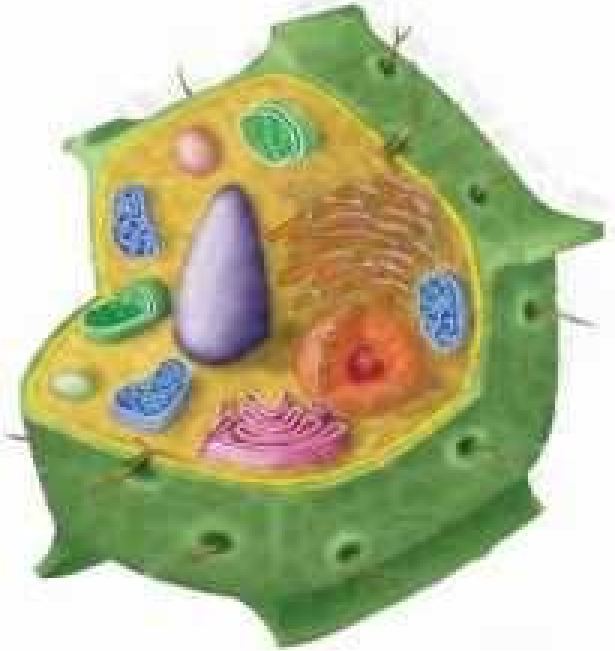
- Golgi complex
- vacuole
- lysosomes

Bellringer

Why does every cell need a membrane?

Cells, Cells, Cells

First things first, there's two different types



Today's Assignment

Refer to Figure 32 on p. 98. Re-create this chart using your own drawing of the cell. But, instead of drawing realistic images, draw an object that provides a visual clue about the organelles job. For example, the Golgi complex, which transports materials, might be a car or a bus. All charts should still include a description of the organelles jop.

Things to Do

- Homework
  - Study for Key Terms Quiz
- Assessments
  - Key Terms Quiz
    - Thursday
  - Section Test
    - Friday

Eukaryotic Cells: The Inside Story

Day 4

Objective

1. I will describe each part of a eukaryotic.
2. I will explain the function of each part of a eukaryotic cell.
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New Key Terms

- cell wall
- ribosomes
- endoplasmic reticulum
- mitochondria
- chloroplast
- Golgi complex
- vacuole
- lysosomes

Bellringer

Review posters made yesterday to help prepare for Key Terms Quiz

Eu-karyotic Cells

After the Quiz

Write a story a science fiction story about an animal whose cells are invaded by chloroplast . Describe how that animal's life processes would be affected and how that animal would use this unusual occurrence to its advantage. I encourage you to use an animal other than a mammal.

This story will be share with the call after the quiz.

The organelles in the cell are rebelling against the nucleus. Write a story or a script between the nucleus and the other organelles. Help each organelle present a case for why it needs a rest and then have the nucleus explain what would happen if even one of them took two weeks off.

This story will be share with the call after the quiz.

Things to Do

- Homework
  - Study for Section Quiz
- Assessments
  - Section Test
    - Friday