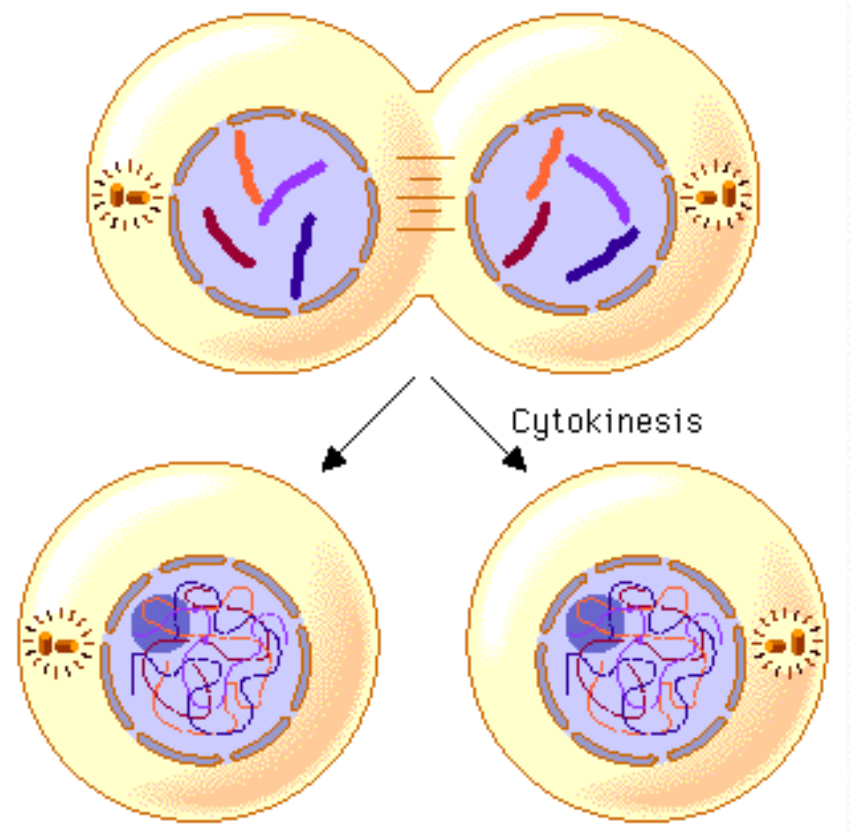
Prokaryotic Cells
Vs.
Eukaryotic Cells

Cell Theory

- 1. All organisms are made up of cells.
  2. Cells are the basic unit of structure and function in all organisms.
  3. All cells come from cells that already exist.

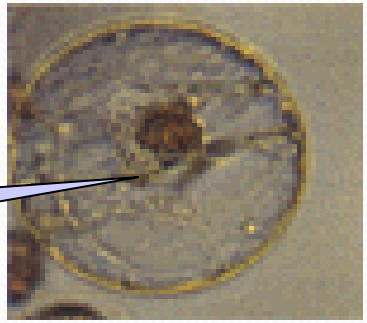


Definition of Cell

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

Examples of Cells

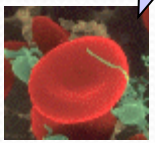
Amoeba Proteus



Plant Stem

Bacteria

Nerve Cell



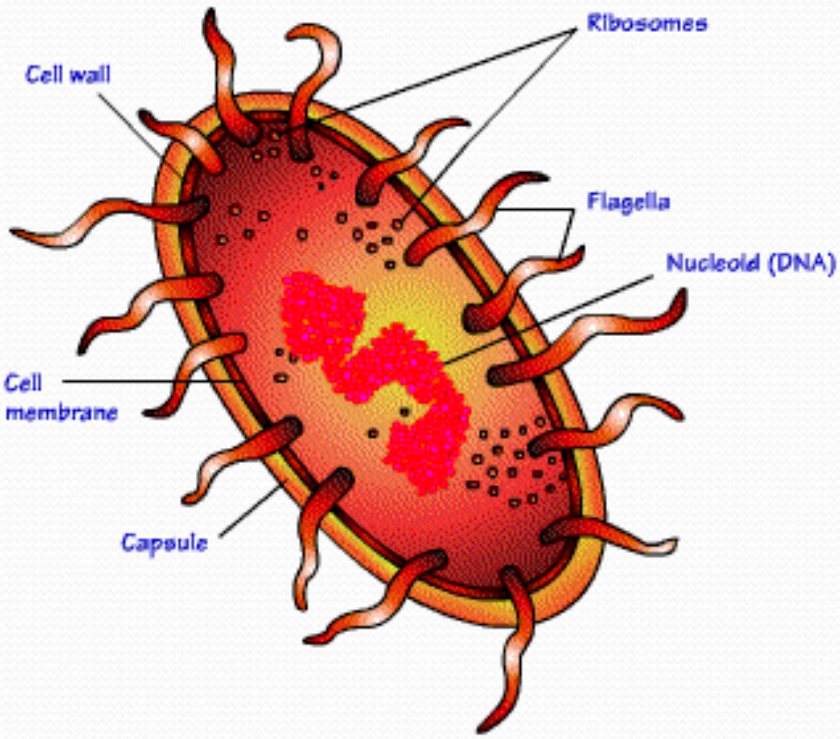
Red Blood Cell

Two Types of Cells

1. Prokaryotic
2. Eukaryotic

Prokaryotic

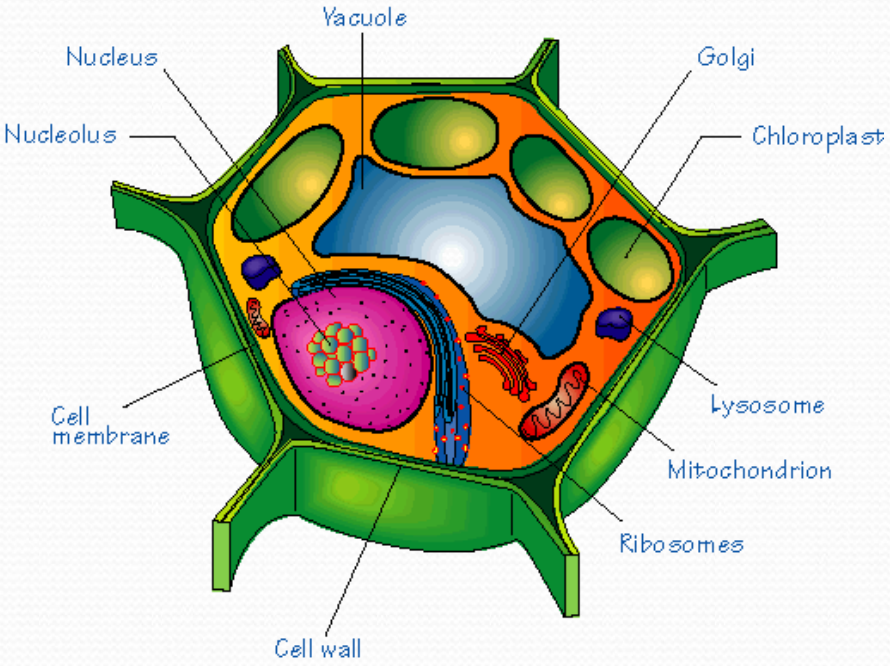
- Do not have structures surrounded by membranes
- Few internal structures
- One-celled organisms, Bacteria



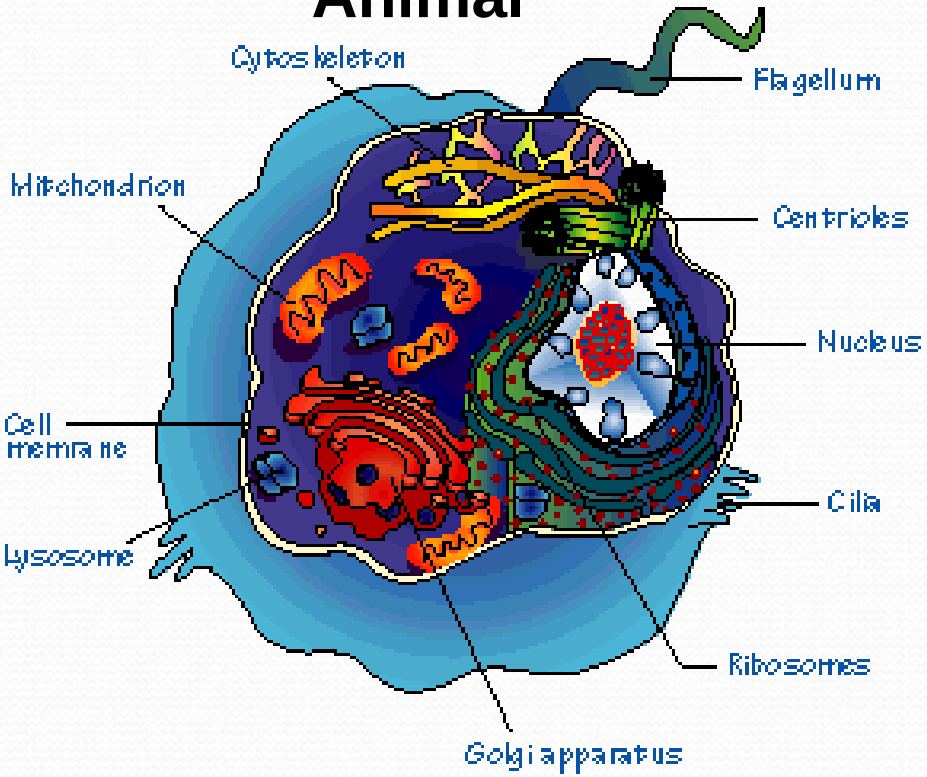
Eukaryotic

- Contain <u>organelles</u> surrounded by membranes
- Most living organisms

Plant



Animal



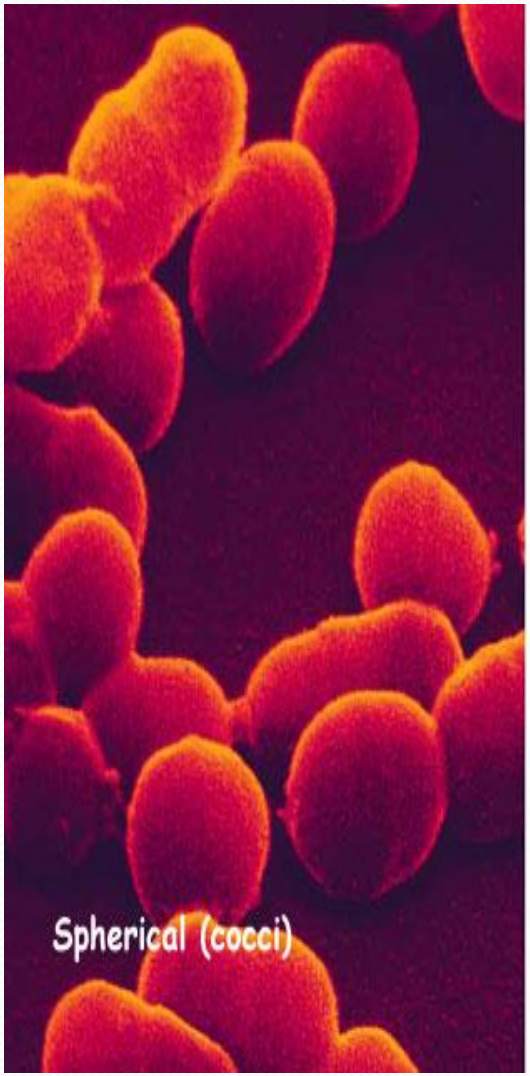
The Characteristics of Prokaryotes

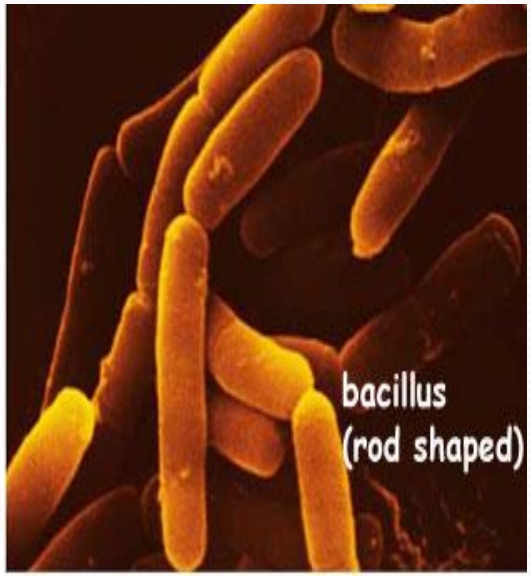
- Prokaryotes are the simplest type of cell.
- Oldest type of cell appeared about four billion years ago.
- Prokaryotes are the largest group of organisms
- Prokaryotes unicellular organisms that are found in all environments.

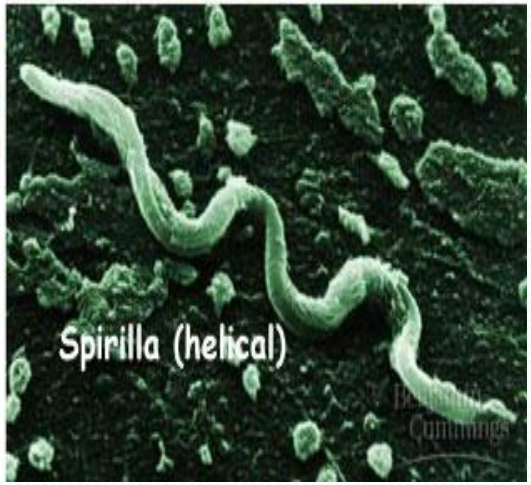
The Characteristics of Prokaryotes

- Prokaryotes do not have a nuclear membrane . Their circular shaped genetic material dispersed throughout cytoplasm.
- Prokaryotes do not have membrane-bound organelles .
- Prokaryotes have a simple internal structure.
- Prokaryotes are smaller in size when compared to Eukaryotes.

Shapes of Prokaryotes







- Cocci = spherical (round)
- Bacillus = (rod shaped)
- Spirilla = helical (spiral)

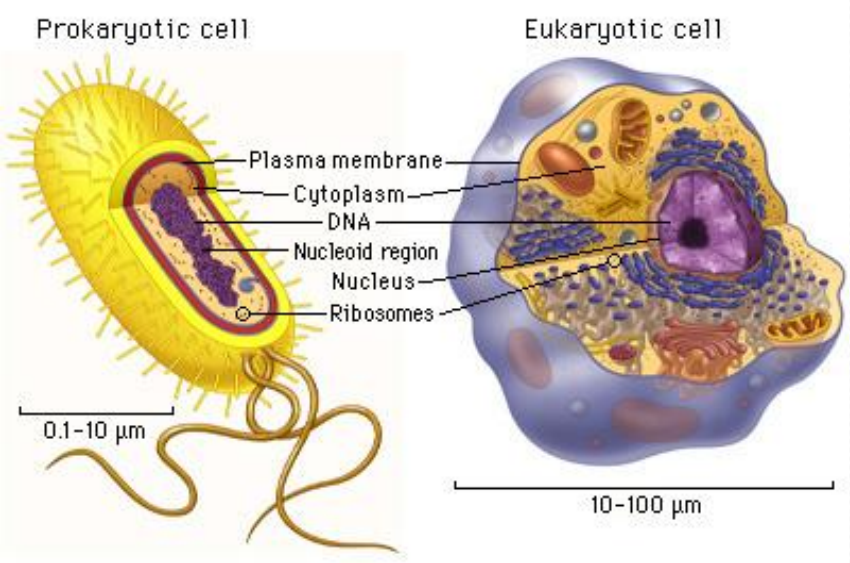
The characteristics of eukaryotes

- Eukaryotic cells appeared approximately one billion years ago
- Eukaryotes are generally more advanced than prokaryotes
- Nuclear membrane surrounds linear genetic material (DNA)

Is there more? Yes!!!

- Unlike prokaryotes, eukaryotes have several different parts.
- **Eukaryote's** organelles have coverings known as membranes.
- **Eukaryotes** have a complex internal structure.
- **Eukaryotes** are larger than prokaryotes in size .

The similarities



- Both types of cells have cell membranes (**outer covering of the cell**)
- Both types of cells have **ribosomes**
- Both types of cells have **DNA**
- Both types of cells have a liquid environment known as the **cytoplasm**

What's the difference between prokaryotes and eukaryotes?

- **Prokaryotic cells** were here first and for billions of years were the only form of life on Earth. All **prokaryotic** organisms are **unicellular**

- **Eukaryotic cells** appeared on earth long after **prokaryotic cells** but they are much more advanced. **Eukaryotic** organisms unlike **prokaryotic** can be **unicellular** or **multicellular**.

Summary of differences!

Prokaryotic Cells	Eukaryotic cells
small cells (< 5 mm)	larger cells (> 10 mm)
always unicellular	often multicellular
no nucleus or any membrane-bound organelles	always have nucleus and other membrane-bound organelles
DNA is circular, without proteins	DNA is linear and associated with proteins to form chromatin
ribosomes are small (70S)	ribosomes are large (80S)
no cytoskeleton	always has a cytoskeleton
cell division is by binary fission	cell division is by mitosis or meiosis
reproduction is always asexual	reproduction is asexual or sexual

Your turn:

Make a Diagram outlining the similarities and differences between prokaryotes and eukaryotes

Plant and Animal Cells

+

Animal Cells

- Can not make their own food so they have to eat food
- Do not go through photosynthesis
- Animal cells are more round shaped
- Animal cells have lysosomes
- Animal cells can not make sugar
- Animal cells use mitochondria to release energy

Animal cells cont.

- Animal cells do not have a cell wall
- We are all made of animal cells
- Animal cells do not have a large vacuole
- They do not have chloroplast

Plant Cells

- Plant cells have a **cell wall**
- Plant cells have a **large vacuole** unlike the animal cell
- **Plant cells have mitochondria**
- **They also have lysosome's**
- Plant cells are in the shape of a rectangle
- Plant cells go through photosynthesis

Plant Cells cont.

- Plant cells have **chloroplast**
- Plant cells use chloroplast to **store energy**
- They also have **cell membranes**

Similarities of Animal and Plant Cells

- They both have a nucleus
- They both have ribosome's that make protein
- Animal and plant cells both have Golgi bodies
- They both have cytoplasm
- They both have vacuoles that store food, water and waste products.