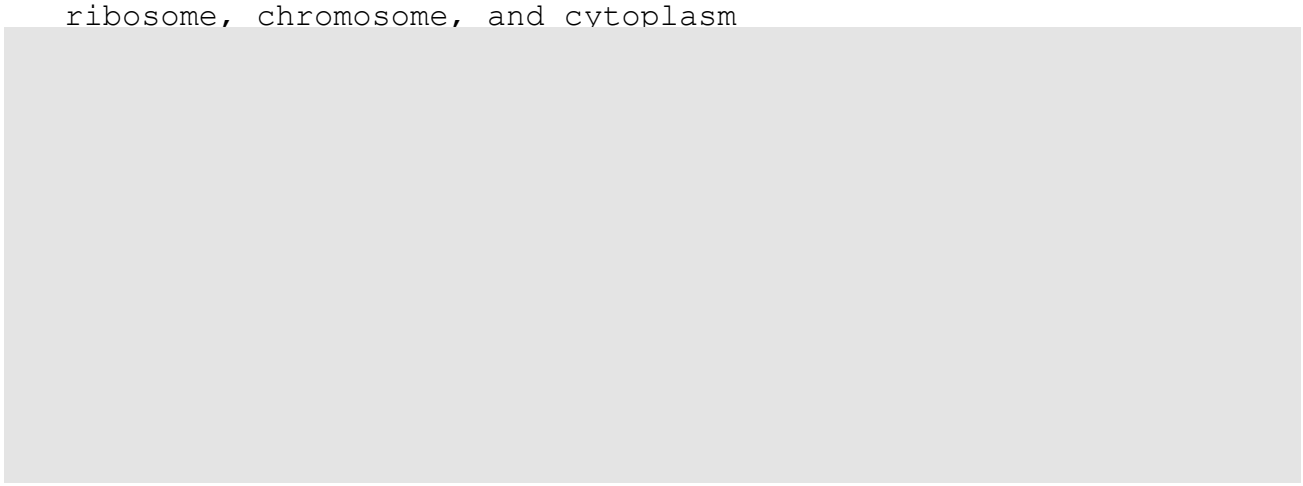
- Cells are the smallest unit exhibiting characteristics of life
- The small size of cells is advantageous considering a favorable ratio of the cytoplasmic volume and the membrane surface area.
- The structures common to all cells are the cell membrane, ribosome, chromosome, and cytoplasm



  - The chromosome serves as carrier of genetic information and is made of DNA packaged by proteins.
  - The cytoplasm is the gel-sol solution that fills the inside of the cell.
- Eukaryotic cells have internal membrane compartments called organelles, where specialized functions are performed.
  - The nucleus contains the chromosomes and RNAs and is enclosed by two layers of phospholipid bilayer with pores made of proteins. It is considered the control center because this is where genetic activity happens.
  - The endoplasmic reticulum appears as a set of folds and

- Golgi apparatus is comprised of flattened sacs that allow further modification of proteins. It is called the packaging center of the cell because it wraps materials with phospholipid membrane, producing lysosomes and other vesicular materials.
- Lysosome is vesicle containing hydrolytic enzymes that actively performs digestion. Lysosome does not only digest materials ingested by the cell, but also worn out organelles, and the digested materials can be recycled by the cell.
- Vacuole is a storage organelle that can contain a wide variety of materials, including sugar and water.
- Mitochondria is the organelle where cellular respiration occurs. It has two membranes, the outer membrane that

stretches around the infolded inner membrane called cristae, where proteins pumps and carriers are embedded. The mitochondrion has a fluid-filled cavity where ribosomes and DNA are found. It is theorized that mitochondria, and chloroplasts, where derived from

- Chloroplast is a double-membraned organelle that serve as the site for photosynthesis. Inside the chloroplast is a complex membrane system of thylakoid, where the pigment chlorophyll is found. Similar to the mitochondrion, the chloroplast has its own DNA and ribosome but still rely on the cell for other proteins that it needs.

- Eukaryotes also possess cytoskeleton, a network of three protein filaments that provides shape and support to the cell. The cytoskeleton also provides a structure for anchorage of organelles to keep the cell organized.
- Prokaryotic cells do not possess the membrane-bound organelles found in eukaryotic cells, but can still carry out metabolic activities just like the eukaryotes. Bacteria and Archaea are prokaryotes.

- A cell wall that functions for protection and support is found in both prokaryotes and eukaryotes. Bacterial cell wall is made of peptidoglycan. The cell wall of plants is composed mainly of cellulose, while that of fungi is mainly of chitin.