

Data and Research

- *Cell wall:*
- *Definition: The Cell wall is a fairly rigid layer surrounding the cell, located external to the Cell Membrane.*
- *Function: The Cell wall provides the Cell with structural support, protection, and a filtering mechanism. The Cell wall also prevents over-expansion when water enters the cell.*
- *Cell Type: The cell wall is found in Plants, Bacteria, Archaea, Fungi, and Algae. Animals and most protists do not have cell walls.*
- *Size relative to cell: The circumference of the cell, in 2D around 1/65th of the cell's diameter.*
- *Cell Membrane:*
- *Definition: Also called the plasma membrane, the cell membrane is the second to outer most layer. It contains a wide variety of molecules and primarily proteins.*
- *Function: The cell membrane surrounds the Cytoplasm of a cell and, in animal cells, physically separates the intracellular components from the extra-cellular environment, thereby serving a function similar to that of skin. In Fungi, Bacteria, and plants an additional Cell Wall forms the outermost boundary, however, the cell wall plays mostly a mechanical support role rather than a role as a selective boundary. It also provides shape to the cell and to help attach to other cells to create tissues.*
- *Cell Type: Animals and Plants have Cell Membranes*
- *Size Relative to cell: A little bit smaller than the Circumference*
- *Lysosome*
- *Definition: Lysosomes are organelles that contain digestive enzymes (acid hydrolases). They digest excess or worn out organelles, food particles, and engulfed viruses or bacteria. The membrane surrounding a lysosome prevents the digestive enzymes inside from destroying the cell. Lysosomes fuse with vacuoles and dispense their enzymes into the vacuoles, digesting their contents. They are built in the Golgi apparatus.*
- *Function: The lysosomes are used for the digestion of other dying cells or larger extra-cellular material. Other functions include digesting foreign bacteria (or other forms of waste) that invade a cell and helping repair damage to the plasma membrane by serving as a membrane patch, sealing the wound.*
- *Cell Type: Animals and Plants have Lysosomes.*
- *Size Relative to Cell: Are small spherical objects, around 100th of a cell.*
- *Ribosome: A ribosome is a small, dense, functional structure found in all known cells that assemble proteins. It catalyses the assembly of protein chains by reading messenger RNAs and binding amino acids that are attached to transfer RNA molecules.*
- *Function: Small structure that functions in Protein Assembly.*
- *Cell Type: All known Cells*
- *Size relative to cell: 1000th of a Animal Cell*
- *Endoplasmic Reticulum*
- *Definition and Function: Folded membranes extending throughout the cell, studded with Ribosome's; help transport materials throughout cell, site of much protein manufacturing.*
- *Cell Type: In both Plant and Animal Cells*
- *The Smooth Endoplasmic Reticulum is so named because it appears smooth by electron microscopy*
- *The Rough Endoplasmic Reticulum appears "Pebbled" by electron microscopy due to the presence of numerous Ribosome's on it's surface. Proteins synthesized on these ribosome's collect in the endoplasmic reticulum for transport throughout the cell.*
- *Size relative to cell: 1/25th of the cell.*
- *Nucleus: The nucleus is mostly found in Eukaryotic Cells contains most of the cell's genetic material, organized as multiple long linear DNA molecules in complex with a large variety of proteins.*
- *Function: The main function of the cell nucleus is to control gene expression and mediate the replication of DNA during the Cell Cycle.*

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- *Cell Type: Animal and Plant*
- *Size relative to Cell: 1/10th of cell*
- *Centriole:*
- *Definition: Each Centriole is a ring of nine groups of fused micro-tubules.*
- *Function: Essential to cells reproduction.*
- *Cell Type: Only Animal Cells*
- *Size relative to cell: 1/10th of the animal cell*
- *Cytoplasm:*
- *Definition: Jellylike fluid primarily water but also contains enzymes and amino acids.*
- *Function: The cytoplasm is the site where most cellular activities are done. All the functions for cell expansion, growth and replication are carried out in the cytoplasm of the cell.*
- *Cell Type: found in both Animal and Plants cells*
- *Size relative to the cell: 45% for a Plant cell and 65% for a Animal cell*
- *Mitochondrion:*
- *Definition: The site of sugar and fat digestion in the cell.*
- *Function: Produces energy for the cell*
- *Cell type: In both animal and plant.*
- *size relative to the cell: 2/100ths*
- *Vacuole:*
- *Definition and Function: A sac that stores and transports ingested materials, waste products and water.*
- *Cell Type: Found in both animal and plant cells*
- *Size relative to the cell: 1/30th in an animal cell, 47% in a Plant cell.*
- *Golgi Apparatus*
- *Definition: The Golgi Apparatus is a Membrane bound structure with a single membrane*
- *Function: Golgi apparatus is essential in modifying, sorting, and packaging these substances for cell produced and discharged or for use within the cell.*
- *Cell Type: Both*
- *Size relative to cell: 5%*