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| **Topic 1: Cells and the Organization of Life****Introduction**

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| Eukaryotic cells are larger and more complex than prokaryotic cells. Both include many organelles.* **Eukaryotic Cells** - Cell that possesses a nucleus and the other membranous organelles characteristic of complex cells.
* **Prokaryotic Cells** - Cell lacking a nucleus and the membranous organelles found in complex cells; bacteria, including cyanobacteria.
* **Organelles** - Specialized structure within cells (e.g., nucleus, mitochondria, and endoplasmic reticulum).

**What do they have in common**:* **Cell Wall** – only found in Plant Cells and Prokaryotic Cells. Shapes, supports and protects the cell
* **Cell Membrane** – found in both Plant and Animal Cells and Prokaryotic Cells. Regulates materials entering and leaving cells. Also protects and supports the cell.
* **Ribosomes** – found in both Plants and Animal Cells and Prokaryotic Cells. Synthesizes proteins
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**Plant Cells**

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| http://www.mhhe.com/micro_prep/cem2s3_2.jpgThis plant cell has some structures not found in animal cells. These include a cell wall outside of the plasma membrane, a large central vacuole, and chloroplasts.* **Cell Wall** - Protective barrier outside the plasma membrane of plant and certain other cells.
* **Cell Membrane** - Membrane surrounding the cytoplasm that consists of a phospholipid bilayer with embedded proteins; functions to regulate the entrance and exit of molecules from cell.
* **Vacuole** - Membranous cavity usually filled with fluid.
* **Chloroplasts** - Membranous organelle that contains chlorophyll and is the site of photosynthesis.
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**Animal Cell**

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| * **http://www.mhhe.com/micro_prep/cem2s3_1.jpgNucleus** - The distinctive organelle of a eukaryotic cell, consisting of a membranous envelope in which the chromosomes reside
* **Endoplasmic Reticulum** - Membranous system of tubules, vesicles, and sacs in cells, sometimes having attached ribosomes. Rough ER has ribosomes; smooth ER does not. Assembles proteins
* **Mitochondria** - Membranous organelle in which aerobic cellular respiration produces the energy carrier ATP.
* **Golgi apparatus** – Stacked set of membranes that modifies, transports, and packages materials for export
* **Lysosomes** – breakdown and recycles macromolecules
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http://classes.midlandstech.edu/carterp/Courses/bio101/labquiz2/prokaryote.jpg |

**Prokaryotic Cell**

* **Flagella** – Whip-like tails that allow bacteria to move quickly through liquid surroundings
* **Nucleoid** – Region that contains the DNA. Not enclosed in a membrane
* **Plasmid** – Small circular piece of DNA

**Organization of Life**

Life is organized in ways from the simplest to the complex. At the multicellular level, specialized cells develop in such a manner where they structure (shape) helps them better perform a specific function (their job).