

Organelles of prokaryote and eukaryote cells



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Prokaryote Organelles:

Nucleoid Region: The region in a prokaryotic cell consisting of a concentrated mass of DNA. (The “ nucleus” of a prokaryotic cell) The nucleoid instructs all the organelles on what to do.

Ribosome: A cell organelle consisting of RNA and protein organized into two subunits and functioning as the site of protein synthesis in the cytoplasm. The ribosomal subunits are constructed in the nucleolus. (Make proteins from amino acids) The nucleoid controls the ribosomes and specifies which proteins to make.

Plasma Membrane: The thin layer of lipids and proteins that sets a cell off from its surroundings and acts as a selective barrier to the passage of ions and molecules into and out of the cell; consists of a phospholipid bilayer in which are embedded molecules and protein cholesterol. (“ skin” of a cell) The membrane surrounds the organelles and serves as a filter, allowing certain chemicals in and out of the cell.

Prokaryotic Cell Wall: A fairly rigid, chemically complex wall that protects the prokaryotic cell and helps maintain its shape. (“ armor” of a cell)

Capsule: A sticky layer that surrounds the bacterial cell wall, protects the cell surface, and sometimes helps glue the cell to surfaces. (outer “ clothes” of a cell)

Pili: Short projections on the surface of the prokaryotic cells that help prokaryotes attach to other surfaces. (“ feet” of a cell)

Prokaryotic Flagella: A long surface projection that propels a prokaryotic cell through its liquid environment; totally different from the flagellum of a eukaryotic cell. (“ Motor” of a cell)

Eukaryot Organelles

Nucleus: The genetic control center of a eukaryotic cell. (Brain) Controls all the cell’s action and stores the DNA information. The nucleus is where the ribosomes are made.

Endoplasmic reticulum: ER membranes partition the cell into separate parts.

- **Rough ER:** A network is a network of interconnected flattened sacs with two main functions: To make more membrane material; To make proteins for antibodies using a molecule called glycoprotein.
- **Smooth ER:** A network of interconnected tubules that lack ribosomes. Synthesizes lipids such as fatty acids, phospholipids and steroids. The smooth ER in the liver also regulates the amount of sugar released from liver cells and also detoxifies drugs. Additionally the smooth ER stores calcium ions in muscle cells.

Golgi Apparatus: A set of separate flattened sac responsible for secreting proteins. (the factory) The ER prepares the raw material, glycoprotein, which is then sent to the Golgi Apparatus for chemical processing. The Golgi Apparatus then makes the chemicals it needs and sends them in little membrane sacs into the membrane, either to be exported out of the cell or to be used by another organelle.

Lysosomes: produced by the rough ER and Golgi Apparatus. The lysosomes consist of digestive enzymes enclosed in a membrane sac. (the stomach) These lysosomes travel the membrane and digest incoming food. Additionally,

they destroy foreign bacteria and digest damaged organelles without harming the cell.

Vacuoles: Membrane sacs, larger than carrying vesicles. (tote bags) Vacuoles can function as large lysosomes. The central vacuole can also help a plant cell grow in size by absorbing water. Sometimes plant vacuoles contain poison or attractive scents for insects.

Chloroplasts: The photosynthesizing organelles of plants and protists. (solar battery) The chloroplast is made of three compartments: Stroma, granum and membrane.

Mitochondria: Organelles that convert energy from one chemical form to another. (converters) They carry out cellular respiration. The chemical energy of foods is converted to the chemical energy of a molecule called ATP, which is the main source of a cell's energy.

Cytoskeleton: A meshwork of fine fibers which extend throughout the cytoplasm. These fibers provide skeletal support, involve in the cell's movement and transport command signals throughout the cell.