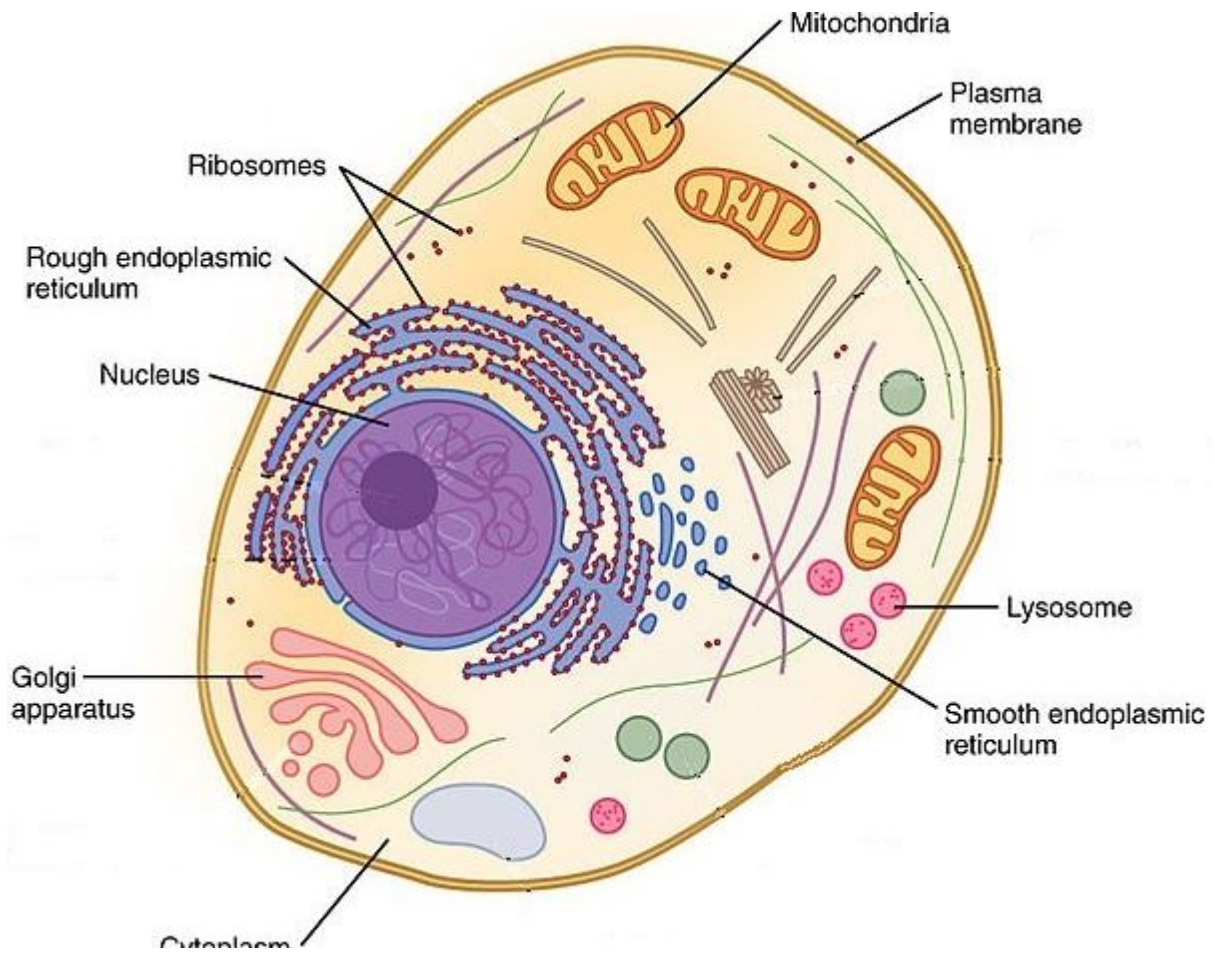


EUKARYOTIC CELL



| Organelle | Function | Factory part |
|------------------------------------|--|--|
| Nucleus | DNA Storage | Room where the blueprints are kept |
| Mitochondrion | Energy production | Powerplant |
| Smooth Endoplasmic Reticulum (SER) | Lipid production; Detoxification | Accessory production - makes decorations for the toy, etc. |
| Rough Endoplasmic Reticulum (RER) | Protein production; in particular for export out of the cell | Primary production line - makes the toys |
| Golgi apparatus | Protein modification and export | Shipping department |
| Peroxisome | Lipid Destruction; contains oxidative enzymes | Security and waste removal |
| Lysosome | Protein destruction | Recycling and security |

NUCLEUS

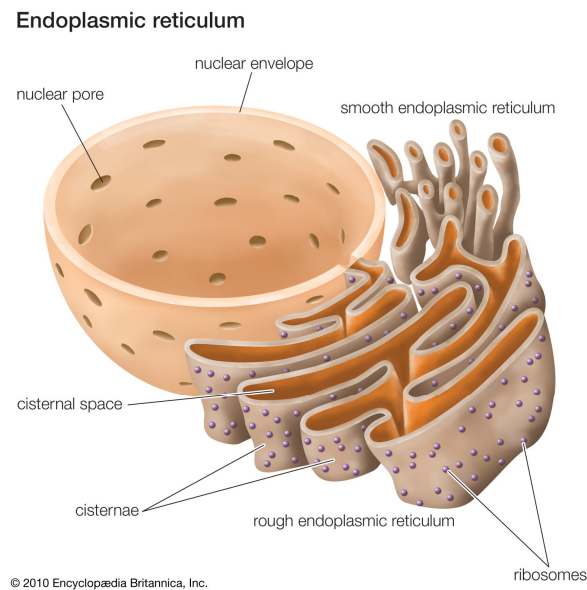
Known as the cell's "command center," the nucleus is a large organelle that stores the cell's DNA (deoxyribonucleic acid). The nucleus controls all of the cell's activities, such as growth and metabolism, using the DNA's genetic information. Within the nucleus is a smaller structure called the nucleolus, which houses the RNA (ribonucleic acid). RNA helps convey the DNA's orders to the rest of the cell and serves as a template for protein synthesis.

RIBOSOMES

Ribosomes are the protein factories of the cell. Composed of two subunits, they can be found floating freely in the cell's cytoplasm or embedded within the endoplasmic reticulum. Using the templates and instructions provided by two different types of RNA, ribosomes synthesize a variety of proteins that are essential to the survival of the cell.

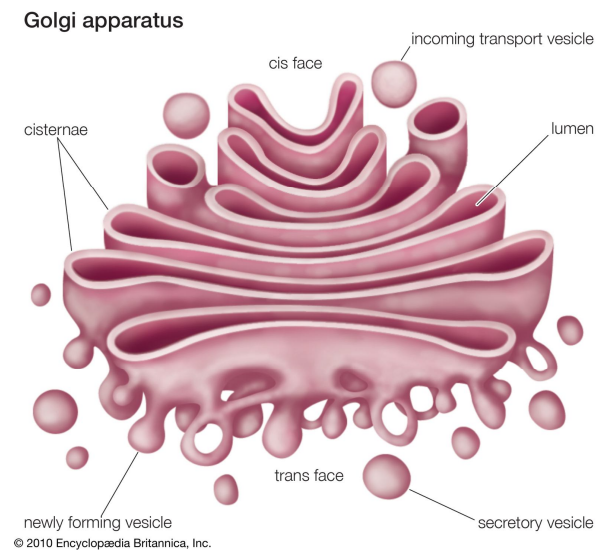
ENDOPLASMIC RETICULUM

The endoplasmic reticulum (ER) is a membranous organelle that shares part of its membrane with that of the nucleus. Some portions of the ER, known as the rough ER, are studded with ribosomes and are involved with protein manufacture. The rest of the organelle is referred to as the smooth ER and serves to produce vital lipids (fats).



GOLGI APPARATUS

If the proteins from the rough ER require further modification, they are transported to the Golgi apparatus (or Golgi complex). Like the ER, the Golgi apparatus is composed of folded membranes. It searches the protein's amino acid sequences for specialized "codes" and modifies them accordingly. These processed proteins are then stored in the Golgi or packed in vesicles to be shipped elsewhere in the cell.



MITOCHONDRIA

The "powerhouses" of the cell, mitochondria are oval-shaped organelles found in most eukaryotic cells. As the site of cellular respiration, mitochondria serve to transform molecules such as glucose into an energy molecule known as ATP (adenosine triphosphate). ATP fuels cellular processes by breaking its high-energy chemical bonds. Mitochondria are most plentiful in cells that require significant amounts of energy to function, such as liver and muscle cells.

