Organelles



**Organelles**

Defines structures found in most eukaryotic cells.

http://www.ck12.org/life-science/Organelles-in-Life-Science/lesson/Organelles/



**Do brain** [**cells**](http://www.ck12.org/biology/Cells) **have the same internal structures as your other cells?**

Yes. Although brain [cells](http://www.ck12.org/biology/Cells) look quite different from your other cells, they have the same internal structures as other cells. They need the same structures because they need to perform the same tasks, such as making [proteins](http://www.ck12.org/biology/Proteins) and obtaining [energy](http://www.ck12.org/physics/Energy).

**Organelles**

Eukaryotic [cells](http://www.ck12.org/biology/Cells) have many specific functions, so it can be said that a cell is like a factory. A factory has many machines and people, and each has a specific role. Just like a factory, the cell is made up of many different parts. Each part has a special role. The different parts of the cell are called **organelles**, which means "small organs." All organelles are found in eukaryotic cells. Prokaryotic cells are "simpler" than eukaryotic cells. Though prokaryotic cells still have many functions, they are not as specialized as eukaryotic cells, lacking membrane-bound organelles. Thus, most organelles are not found in prokaryotic cells.

Below are the main organelles found in eukaryotic cells (**Figure** [below](http://www.ck12.org/life-science/Organelles-in-Life-Science/lesson/Organelles/#x-ck12-TVNMUy0wMy0wOS1ldWthcnlvdGVz)):

1. The **nucleus** of a cell is like a safe containing the factory's trade secrets. The nucleus contains the genetic material ([DNA](http://www.ck12.org/biology/DNA)), the information needed to build thousands of [proteins](http://www.ck12.org/biology/Proteins).
2. The **mitochondria** are the powerhouses of the cell. Mitochondria are the organelles where cellular [energy](http://www.ck12.org/physics/Energy) is produced, providing the energy needed to power [chemical reactions](http://www.ck12.org/chemistry/Chemical-Reactions). This process, known as **cellular respiration**, produces [energy](http://www.ck12.org/physics/Energy) is in the form of **ATP** (adenosine triphosphate). Cells that use a lot of energy may have thousands of mitochondria.
3. **Vesicles** are small membrane bound sacs that transport materials around the cell and to the [cell membrane](http://www.ck12.org/life-science/Cell-Membrane-in-Life-Science).
4. The **vacuoles** are like storage centers. Plant cells have larger vacuoles than animal cells. Plants store [water](http://www.ck12.org/biology/Water-Advanced) and nutrients in their large central vacuoles.
5. **Lysosomes** are like the recycling trucks that carry waste away from the factory. Lysosomes have digestive [enzymes](http://www.ck12.org/biology/Enzymes) that break down old molecules into parts that can be recycled.
6. In both eukaryotes and prokaryotes, **ribosomes** are the non-membrane bound organelles where [proteins](http://www.ck12.org/biology/Proteins) are made. [Ribosomes](http://www.ck12.org/biology/Ribosomes) are like the machines in the factory that produce the factory's main product. Proteins are the main product of the cell.
7. Some [ribosomes](http://www.ck12.org/biology/Ribosomes) can be found on folded membranes called the **endoplasmic reticulum** (ER), others float freely in the cytoplasm. If the ER is covered with [ribosomes](http://www.ck12.org/biology/Ribosomes), it looks bumpy like sandpaper, and is called the rough [endoplasmic reticulum](http://www.ck12.org/biology/Endoplasmic-Reticulum). If the ER does not contain ribosomes, it is smooth and called the smooth endoplasmic reticulum. Many proteins are made on the ribosomes on the rough ER. These proteins immediately enter the ER, where they are modified, packaged into vesicles and sent to [the **Golgi apparatus**](http://www.ck12.org/biology/The-Golgi-Apparatus). [Lipids](http://www.ck12.org/biology/Lipids) are made in the smooth ER.
8. The **Golgi apparatus** works like a mail room. [The Golgi apparatus](http://www.ck12.org/biology/The-Golgi-Apparatus) receives proteins from the rough ER and puts "shipping addresses" on them. The Golgi then packages the proteins into vesicles and sends them to the right place in the cell or to the [cell membrane](http://www.ck12.org/life-science/Cell-Membrane-in-Life-Science). Some of these proteins are secreted from the cell (they exit the cell); others are placed into the cell membrane.



Eukaryotic cells contain special compartments surrounded by membranes, called organelles. For example, notice in this image the mitochondria, lysosomes, and Golgi apparatus.

Also, the **cytoskeleton** gives the cell its shape, and the **flagella** helps the cell to move. Prokaryotic cells may also have flagella.