

L.2

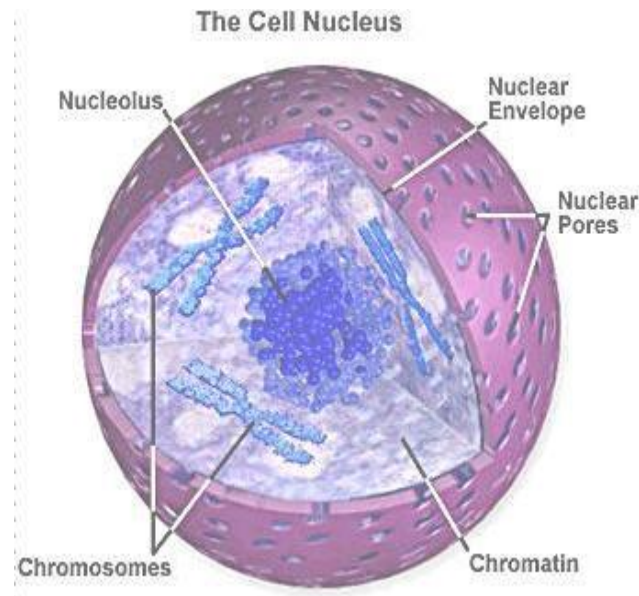
Organelles of The Cell

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Organelles do the work of cells. Each structure has a job to do. They keep the cell alive; keep you alive.

Nucleus

- The control center of the cell. It contains the DNA code for the cell coiled into chromosomes.
- The “brain” of the cell
- Controls all of the cellular activities
- DNA is inside the nucleus
- Surrounded by a membrane called the nuclear envelope
- Contains one or more nucleoli
- Contains chromatin

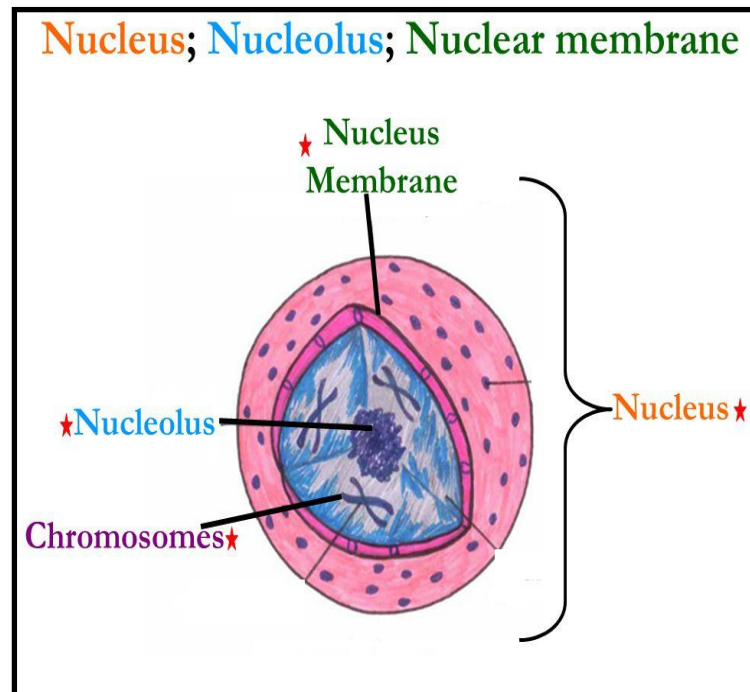
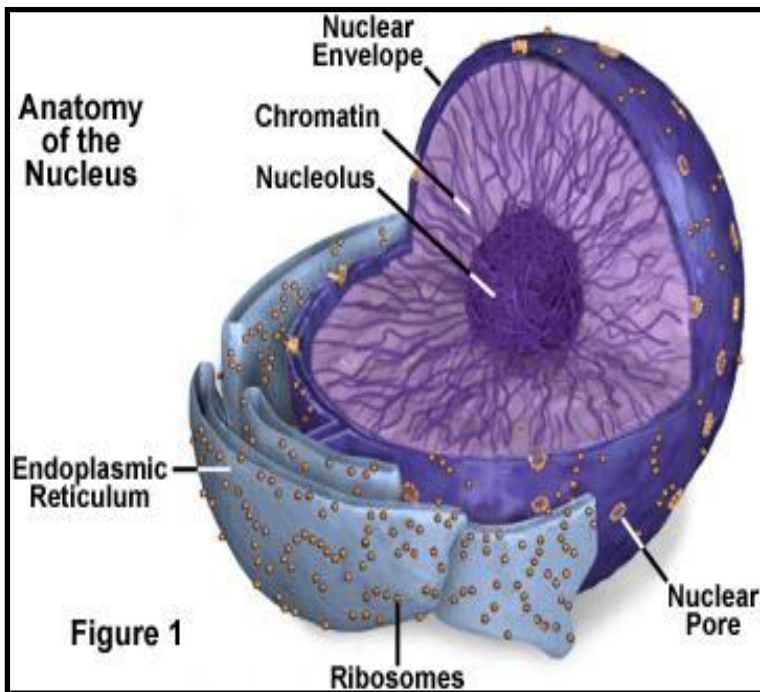


CHROMOSOMES- *are found inside the nucleus*

- *carry the information that determines what traits a living thing will have*

Nucleolus

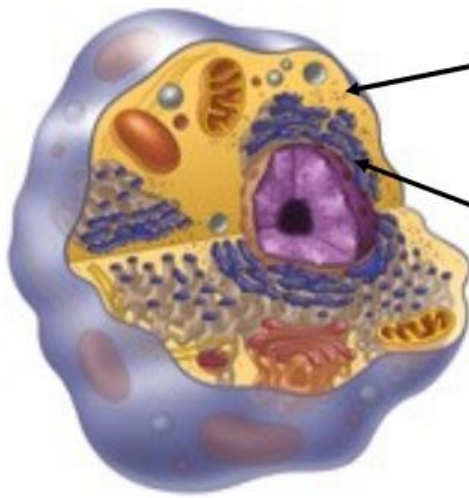
- ❖ The dark area in the nucleus
- ❖ Like a tiny nucleus inside the nucleus.
- ❖ A nucleolus is composed of ribonucleic acid (RNA), and associated proteins.
- ❖ The nucleolus produces ribosomes, which move out of the nucleus and take a positions on the rough endoplasmic reticulum where they are critical in protein synthesis.



RIBOSOMES

Ribosomes

Ribosomes are cellular machines that produce proteins, important biological molecules



*Ribosomes are
either free in the
cytoplasm or
attached to the
Endoplasmic
Reticulum*

Mitochondria

- ❖ Mito = Mighty / Power. And it is The **Power-House** of the cell
- ❖ They break down food molecules so the cell has the energy to live
- ❖ If a cell needs a lot of energy...it will have more mitochondria

Function of mitochondria

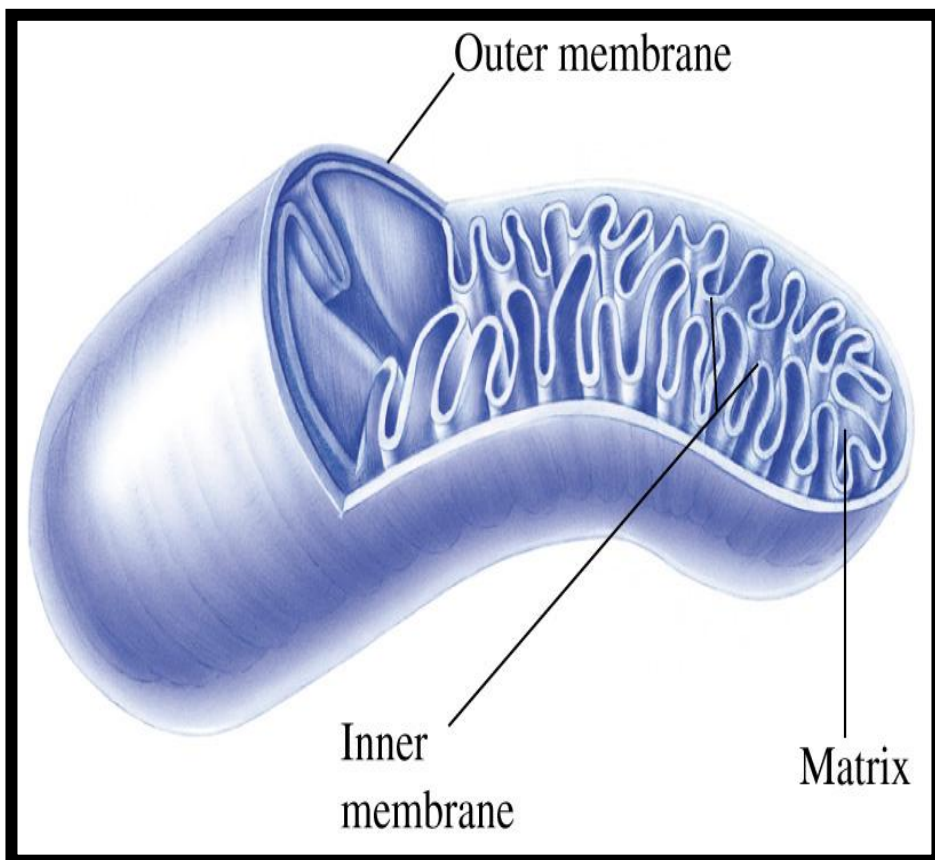
Cellular respiration

- **Generate ATP**
 - ✓ From breakdown of sugars, fats, and other fuels.
 - ✓ In the presence of oxygen
 - ✓ Breakdown larger molecules into smaller to generate energy call = **catabolism**
- ✓ Generate energy in presence of O_2 = **aerobic respiration**

The Mitochondria structure has three main parts:

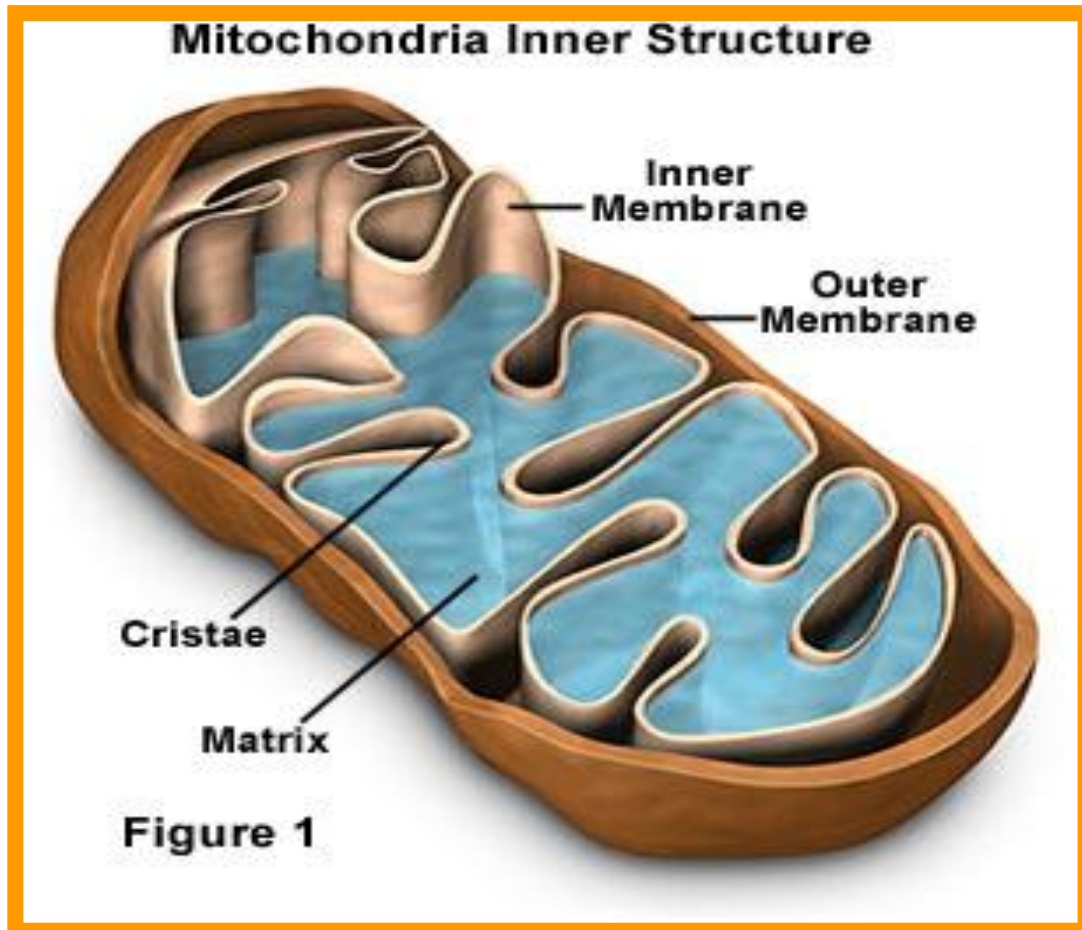
OUTER MEMBRANE: covers the mitochondria

INNER MEMBRANE: folds many times to increase the surface area because chemical reactions (glycolysis) occur here So, the more space it has the more energy it can create.



MATRIX: a fluid that has water and proteins all mixed together (like a solution)

- **The proteins:** Take the food molecules in and combine them with Oxygen to release the energy.
- **Cristae:** Folds created by the inner membrane.

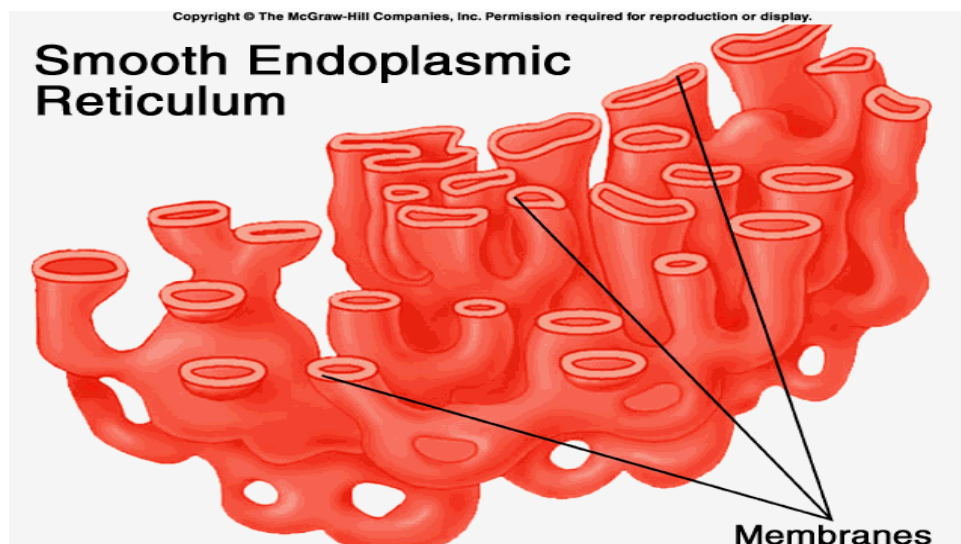


Endoplasmic Reticulum

- ❖ also known as the “ER”
- ❖ it is an organelle inside the cell that is made up of **membranes** that are in the CYTOPLASM of the cell
- ❖ There are two different
 - ✓ Smooth ER
 - ✓ Rough ER

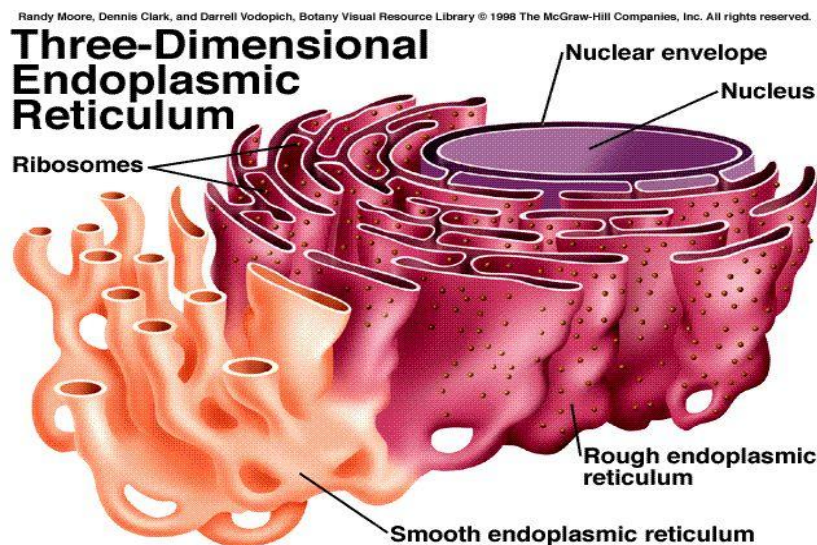
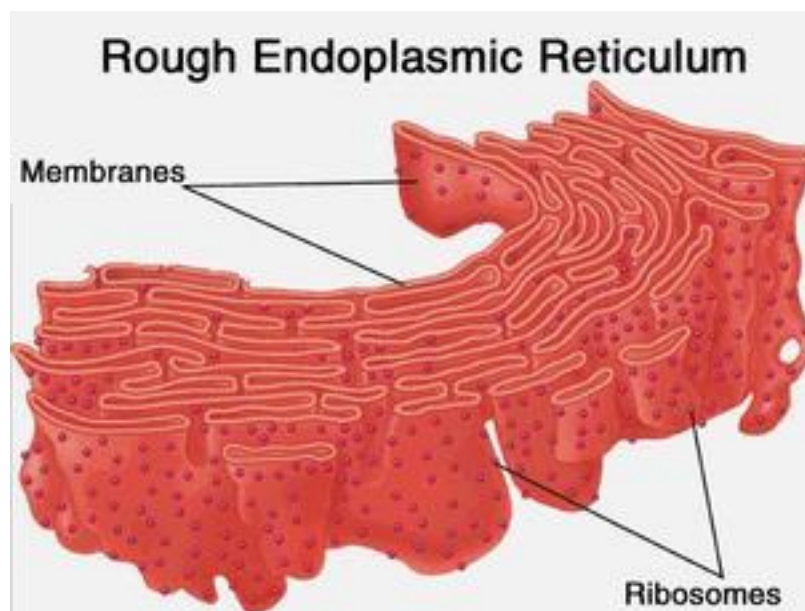
SMOOTH ER

- ❖ Main function is to collect, maintain & transport things
- ❖ Synthesizes lipids such as fatty acid and steroids
- ❖ Detoxifies molecules such as alcohol, drugs, and metabolic waste products
- ❖ Shaped slightly tubular and called smooth because has no ribosomes on its surface
- ❖ Stores Ions for the cell to keep nutrients balanced



Rough ER

- ❖ It has bumps (**ribosomes**) all over it giving it a “rough” appearance
- ❖ Bumps are called **RIBOSOMES**
- ❖ ER collects the proteins (built by the ribosomes) and creates a bubble around them
- ❖ **VESICLE**- is formed when the ER pinches off a part of its membrane



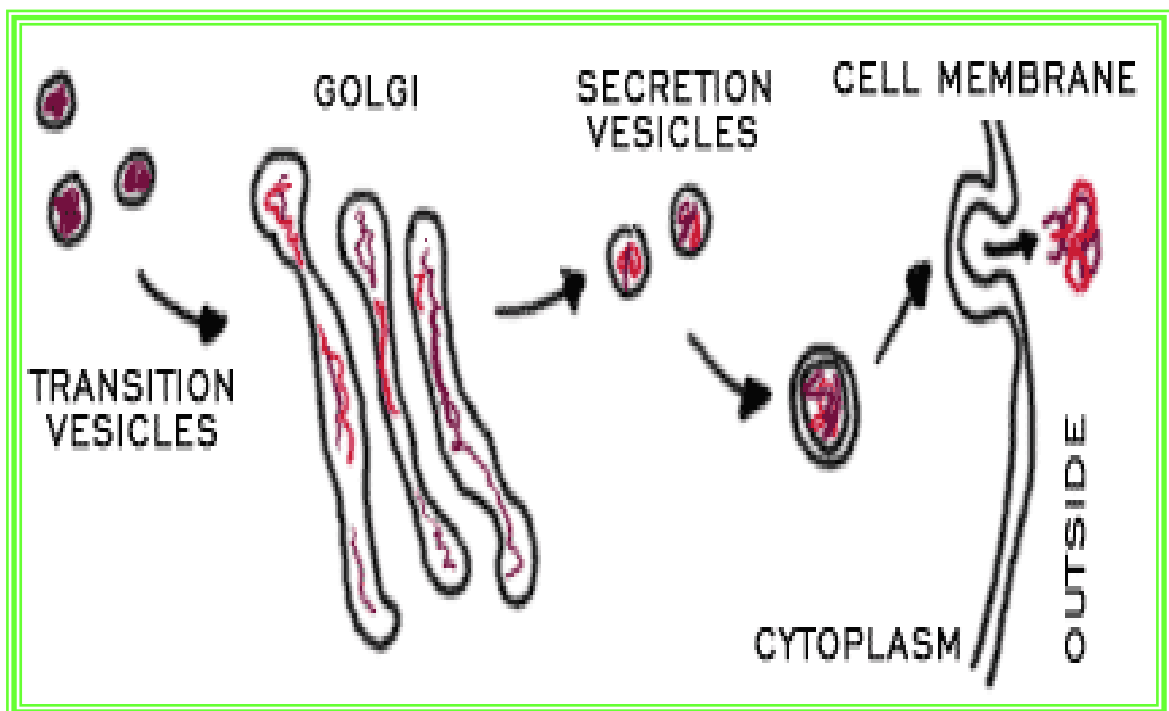
Golgi Apparatus (Complex)

- The protein packaging and transport center of the cell.
- **Transport** of lipids, **creation** of lysosomes and polysaccharides.
- It is made up of a stack of flattened out sacs, like a loose stack of pancakes.
- Has incoming and outgoing vesicles.

WHAT DOES IT DO?

- 1) It takes simple molecules and combines them to make larger molecules.
- 2) Takes those larger molecules and puts them into packs called GOLGI VESICLES.

Think about building a model of a ship (that's the molecule). Then take that model and put it in a bottle (that's the vesicle).



GOLGI APPARATUS

Golgi apparatus

*membranous compartment
of flattened sacs*

*packages, sorts, and sends off
proteins from the rough ER*

