**Name:** **Date:** **Block:**

**The Purpose of the Cell:**

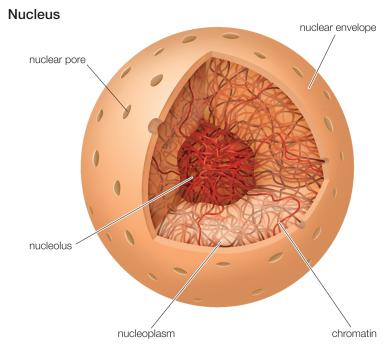
* The cell is complex and has many components.
* These components work together to create a “product” just like a factory.
* The main product of the Cell Factory is !
* Each component of the cell has a specific and specialized role to play in the production of proteins.

**Eukaryotic Organelles:**

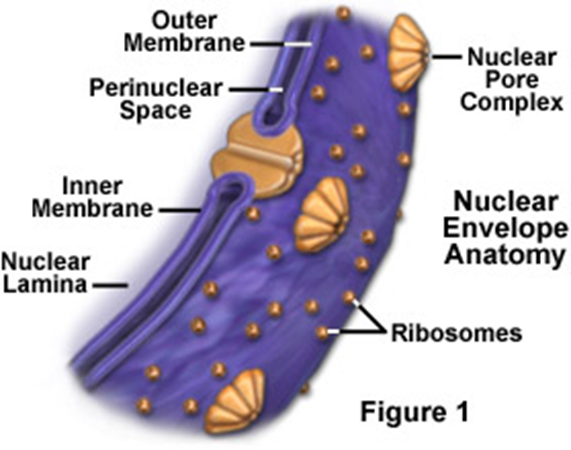
* Eukaryotic cells have specialized structures called .
  + Organelles= “little organs”
* All of the organs in your body are specialized to perform a specific role to keep you functioning and alive…so are the “little organs” of a cell.

**The Cytoplasm:**

* Cell biologist divide the eukaryotic cell into major parts: the and the .
* The cytoplasm is the
* Found in… plants animals both

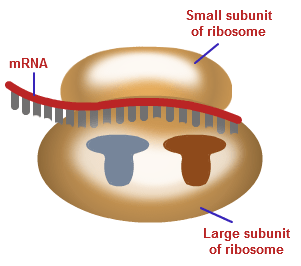
**The Nucleus:**

* In the same way that the main office controls a large factory, the is the control center of the cell.
* The nucleus contains nearly all of the cell’s (and with it, the coded instructions for making proteins!) Anything in the cell that is not in the nucleus is considered the .
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**Components of the Nucleus:**

* The nucleus contains a small dense region called the . The nucleolus makes ribosomal RNA (rRNA), which is used to build ribosomes.
* The nucleus is surrounded by a , composed of two membranes. The nuclear envelope is dotted with thousands of which allow material to move in and out.
* When the cell isn’t dividing, the nucleus is full of . Chromatin is DNA that is .
* When the cell is about to divide, the chromatin condenses to form chromosomes.
  + **Chomatin=**
  + **Chromosomes**=

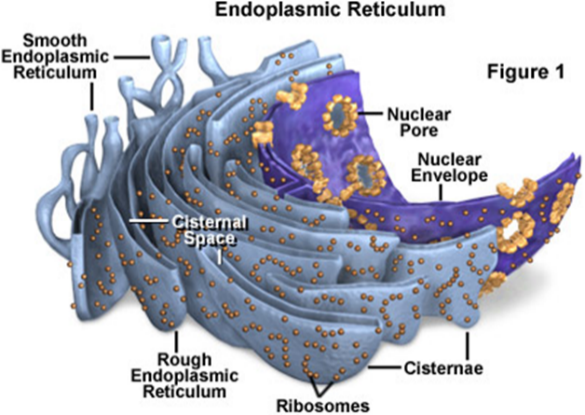
**Ribosomes:**



* If the job of a cell is to make proteins, then are where the magic happens.
* Ribosomes are
* Ribosomes produce proteins by following the instructions given by the nucleus.
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**Endoplasmic Reticulum:**

* The ER is an internal membrane system.
* There are **two** types: and
* The endoplasmic reticulum is the site where lipid components of the cell membrane are assembled, along with proteins and other materials that are exported from the cell.
* Found in… plants animals both

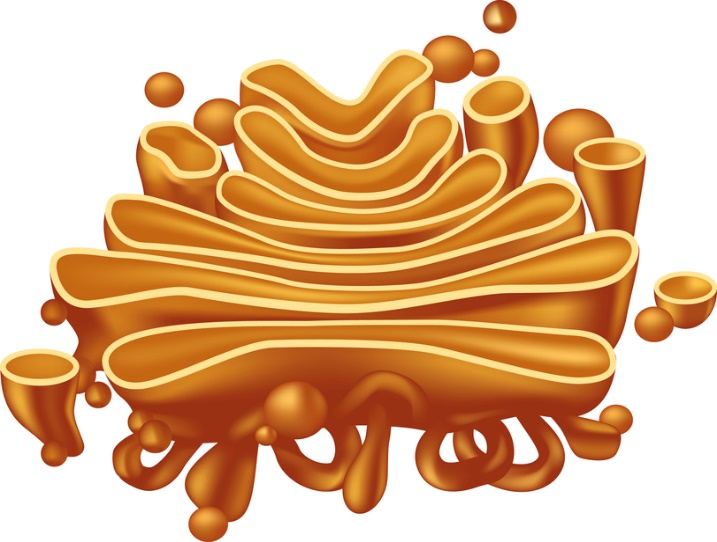
**Rough Endoplasmic Reticulum:**

* It is considered rough because it is
* Rough ER is involved in the . Proteins leave the ribosomes and enter the endoplasmic reticulum where they are modified and transported.
* Rough ER produces all of the proteins that will be transported outside of the cell.

**Smooth Endoplasmic Reticulum:**

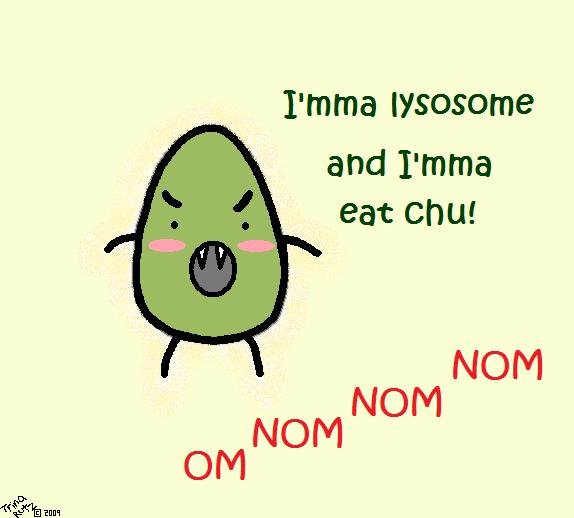
* Smooth endoplasmic reticulum has !
* Smooth ER has a collection of enzymes that help detoxify the cell.
* **It makes**  .
* Liver cells, which do a lot of detoxifying for your body, have a lot of smooth endoplasmic reticulum.

**Golgi Apparatus:**

* ****Proteins that are produced in the rough ER move next to the
* The Golgi will , , , and proteins from the rough ER for storage in the cell or secrete it to the outside of the cell.
* From the Golgi, the proteins are shipped outside of the cells using
* Found in… plants animals both

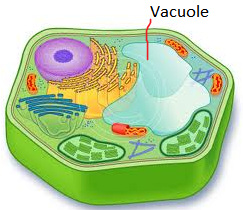
**Lysosomes:**

* Also known as the “clean up crew”

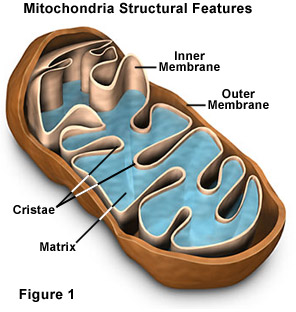


* L : are small organelles filled with enzymes.
* Lysosomes function in digestion or breakdown of macromolecules, like lipids, carbohydrates, and proteins that are worn out or no longer needed.
* Their “recycle” the junk by breaking them down into small particles that can be used as new building materials by the cell.
  + For example: !
* If lysosomes did not perform their important function, broken machinery (like organelles) and other components that have out lived their usefulness would build up in the cell.
* A number of serious human diseases, including disease can be traced to lysosomes that fail to function properly.
  + “Trash” builds up in the cells (lipids, in the case of Tay-Sachs) causing them to stop functioning. The body progressively shuts down, drowned by its own garbage.
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**Cell Vacuole:**

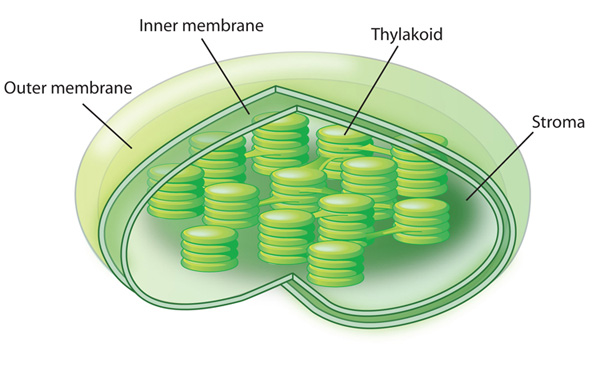
* Every factory needs a place to store things, and vacuoles are that .
* V : are empty sacs that store material like water, salts, and carbohydrates.
  + In plants: the vacuole is typically large
  + In animals: they are small, or no vacuoles.
* Plant cells have a filled with liquid. Single celled eukaryotic organisms (like protest) have vacuoles that maintain homeostasis.

**Mitochondria:**



* All living things ! Factories get that energy from power plants…but what about cells?
  + Cells get their energy from or the
* M : are organelles that convert the chemical energy from food into energy for the cell. The POWERHOUSE of the cell.
  + Contains 37 genes (16,000 base pairs) and is solely inherited from your mother.
* Found in… plants animals both

**Chloroplast:**

* C : are organelles that capture energy from the sunlight and convert it into chemical energy in a process called
* Both and are surrounded by two membranes, have their own DNA, independent of the DNA in the nucleus, and replicate themselves. This has led to the theory that WAY back in the day when everything was still single- celled, chloroplast and mitochondria were their own organisms that were engulfed by other cells and not digested. This was called…The .
* Found in… plants animals both

**The Cytoskeleton:**

* Like the steel or cement beams that provide structure, shape, and support to a building, the cytoskeleton gives the cell .
* Helps with cell movement
  + The elements of the cytoskeleton are and
  + C (an element of the microtubules) help organize cell division.

**Flagella & Microvilli:**

* F : a whip-like structure that allows the cell to move, and often functions as a sensory organelle.
  + Prokaryotic and eukaryotic flagella differ greatly in protein composition, structure, and mechanism of propulsion.
* M : microscopic cellular protrusions that increase the surface area of cells and minimize any increased volume. Have a variety of functions including absorption, secretion, and cellular adhesion to name a few. (Seen more in animal tissue.)