



## “Cell Factory”

**Cell Membrane-** The Cell membrane is the outer layer of the cell. The basic function of the cell membrane is to protect the cell from its surroundings. It is also called “fence” or the “international border” because it keeps the “citizens”(the cells components) safe inside and keeps the “foreigners” (unnecessary organisms) away.

**Transmembrane Protein-** The Trans membrane is also a layer that spans the entire cell, its purpose is to act as a gateway to permit the transportation of certain substances across the biological membrane. Some people call it the “Guard shack or Security detail” or “Border crossing”, like in the United States we have border patrol, and so does a cell.

**Nucleus-** The Nucleus hold most of the genetic material; DNA, molecules, along with a variety of proteins, to form chromosomes. Its second and third names are “Head office” or “City Hall”, it is in charge of the most important substances, and holds the key to life; DNA.

**Nuclear Membrane-** The Nuclear Membrane is the protective layer of the Nucleus; it is made up of a double lipid bilayer. Its main function is to encase and protect the important genetic material inside the Nucleus, this is why it’s sometimes called “Office security” or “City Hall fence/Police”, just like the office security would protect the President.

**Nucleolus-** The Nucleolus is an organelle which stores hereditary material and rewrites RNA. Some people refer to the Nucleolus as the “CEO’s office” or “Mayor’s office”, much like in the real world the Mayor or CEO holds the important information tightly to him or her.

**DNA-** DNA, also known as Deoxyribonucleic acid, is a nucleic acid that contains the genetic instructions for the development and function of all living things. Its function is to store and hold the specifics for building life, which is why it is sometimes called “Parts list or blueprints” or “City planning dept.” because without DNA nothing can be built.

**mRNA (Messenger RNA)-** When a specific protein is needed, our cells make a copy of the DNA, called messenger RNA or mRNA. It is also sometimes referred to as the “Post-It Notes or delivery orders” or “Blueprints” because it reminds the other organisms of the genetic material.

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**tRNA (Transfer RNA)**- Transfer ribonucleic acid is a type of RNA molecule that helps decode a messenger RNA sequence into a protein. It is also called the “Parts handling machines or ‘jigs” or “Construction workers” because like in the real world construction workers decode the blueprint and then build the creation.

**Cytoplasm**- Cytoplasm is the jelly-like substance that fills the cell. It functions as the way for the organelles to float and holds some of the materials for growth in it. Some people refer to it as “factory floor” or “environment”, which seems fitting since it is the place for all the organelles to live.

**Mitochondrion**- Mitochondrion is known as the powerhouses of the cell. The most prominent roles of mitochondrion is to produce the energy currency of the cell, which is why it is also called the “power plant”.

**Chloroplasts (in Plants)**- Chloroplast is an organelle unique to plant cells that contains chlorophyll, which is what makes the plant the color green, and is responsible for enabling photosynthesis to occur so that plants can convert sunlight into energy. Some people refer to it as “solar panels”, because it draws in energy and converts it to electricity, in a sense.

**Endoplasmic reticulum**- The endoplasmic reticulum is responsible for folding protein molecules in sacs and transporting synthesized proteins in vesicles to the Golgi apparatus. It is sometimes referred to as the “Assembly area or Shop floor” or “Construction jobsite”, because it is the assembler and constructor.

**Ribosomes**- Ribosome is a cell structure that makes protein. Some people call it the “work bench” or “work station”, because it makes and constructs the important parts of protein.

**Golgi Apparatus**- The job of the Golgi apparatus is to process and bundle macromolecules like proteins and lipids as they are synthesized within the cell. A common reference to the golgi apparatus is “Packaging & shipping dept.” or “Post Office or UPS/Fedex”, like these business ship letters the golgi ships proteins and other substances.

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**Lysosomes-** The lysosomes functions as removing waste, and acts as the digestive system. It is also called “Janitorial dept.” or “Recycling plant” because it acts as the cells waste department.

**Vacuoles & vesicles-** After the Golgi does its work on the molecules inside the sac, a vesicle is created and released into the cytoplasm. From there, the vesicle moves to the cell membrane and the molecules are released out of the cell. Some people refer to it was the “Shipping containers” or Railroad car”, because it is the shipping container for substances.

**Centrosome-** The main purpose of a centrosome is to organize microtubules and provide structure for the cell, as well as divide the cell. It is sometimes called” Road building dept.” because it is the roadway for moving cellular molecules

**Microtubules-** Microtubules are conveyer belts inside the cells. They move vesicles, granules, organelles like mitochondria, and chromosomes by special attachment proteins. Some people refer to it as the “highway”, which it fitting since it is the way for the molecules to move to and fro.

**Motor proteins-** Motor protein also called the “Delivery truck”, it is the motor used for ATP hydrolysis to move along cytoskeleton filaments within the cell.