Cell Model- Organelle Description

**1. Nucleus:** The nucleus is the most important organelle in a cell. It is responsible of preserving and hold the Deoxyribonucleic Acid (DNA) which contains all of the cell’s hereditary information. Furthermore, the nucleus is also responsible for carrying out all of the actions in the cell, it gives instructions to other organelles and controls them so they perform the function they are made for. A really important function the nucleus has is that it's responsible for cell division, this is really important as the cell has the divide in order to grow and spread.

**2. Mitochondria:** The mitochondria is the powerhouse of the cell, its most important function is to produce energy for the cell to use. The mitochondria produces this energy through the process of cellular respiration by taking in nutrients from the other organelles of the cell, breaking it down and turning those nutrients into energy. This energy now can be transported and used to carry out different function in the cell. The number of mitochondria in a cell can vary, it depends on how much energy the cell needs to function.

**3. Vacuole:** Vacuoles are the storage place for organic and inorganic molecules and water of the cell. Vacuoles act as a storage system by storing nutrients and food for the cell to consume later and also the waste products of the cell to protect the cell from contamination. Vacuoles also create a stable pressure inside the cell, this helps the cell stay together and during cell division supports the cell through the process.

**4. Lysosome:** This organelle is similar to the vacuole in many ways. This organelle uses and stores enzymes which are created inside it to break down and digest macromolecules such as lipids, proteins, carbohydrates which the other organelles in the cell can use. However, if the cell has no more nutrients for the Lysosome to digest the Lysosome will digest the cell’s organelles for nutrients. The lysosomes also the lipids and proteins for themselves, there is a membrane on the inside which keeps the organelle’s enzymes from digesting itself.

**5. Cell Membrane:** The cell membrane is a “semi-permeable” barrier meaning that it only allows certain molecules or chemicals to pass through it. The main purpose of a cell membrane is to add a little protection and support to the cell and keep the cell in one piece. However its secondary purpose is to regulate the flow of the molecules so as to remove waste and bring in nutrients. The cell membrane is made up of proteins and other materials which form a wall around the cell.

**6. Smooth Endoplasmic Reticulum:** The Smooth Endoplasmic Reticulum is named that for its lack of ribosomes compared to the Rough Endoplasmic Reticulum. The Smooth Endoplasmic Reticulum is responsible for creating and storing the chemicals known as lipids. This organelle can also be used for a detoxification effect by converting chemicals into safewater products.

**7. Rough Endoplasmic Reticulum:** The Rough Endoplasmic Reticulum main function is to synthesize proteins and amino acids.The Rough Endoplasmic Reticulum differs from the Smooth because it does contain Ribosomes. This Ribosomes are attached to the membrane of this organelle and create proteins for the Rough Endoplasmic Reticulum to function.

**8. Golgi Apparatus:** The Golgi Apparatus is located close to the nucleus and is next to the Rough Endoplasmic Reticulum. The Golgi Apparatus is responsible for transporting and modifying proteins that originated from the Rough Endoplasmic Reticulum. This organelle will contain between 4 to 8 cisternae which are the long narrow pouches seen in the model. Animal cells tend to only contain one however plant cells can contain hundreds of Golgi Apparatus.

**9. Ribosomes:** Ribosomes can be found either on the Rough Endoplasmic Reticulum or free floating in the cytoplasm. The Ribosomes main function is to produce proteins that the cell will use later. The Ribosome does this by synthesizing amino acids into long chains to make these proteins which can be used for later. If a Ribosome is free floating then it will generate proteins for use only within the cell itself. However if a Ribosome is attached to the Rough Endoplasmic Reticulum then the protein can be used within or outside of the cell.

**10. Cilia:** Cilia is an organelle in the cell that resembles that of a human hair. The Cilia sits outside of the cell and can be broken into two different group motile and nonmotile. Motile Cilia move in a sort of wave motion, they can be found in the lungs and the respiratory tract. The Cilia when it moves help keeps the area clear of mucus in the respiratory tract to prevent irritation of the respiratory system or problems breathing. Non-motile Cilia have many function however some act as sensors, for example in the Kidney Cilia will send a signal to the rest of the cell to tell it of urine flow to protect the cell.

**11. Cytoplasm:** Cytoplasm is an extremely important part of the cell. Cytoplasm is a mostly transparent liquid which keeps all the organelles of the cell afloat and carries material between the organelles through the fluid. If Cytoplasm did not exist in the cell it could not function. The organelles of the cell would fall with gravity and possibly pierce the cell membrane. The lack of a cytoplasm would render the cell useless because the cells could not transport signals or material between them so all the organelles would effectively become useless since they rely so heavily on one another.

**12. Peroxisome:** Peroxisome is a very similar organelle to the lysosome in many ways. Whereas the Lysosome will break down macromolecules the Peroxisome’s main function is to get rid of toxic substances. The main chemical this organelle attempts to dispel of is H2O2 also known as Hydrogen Peroxide which can be dangerous to the cell. The Peroxisome does this by converting Hydrogen Peroxide into its safer Hydrogen Dioxide counterpart also known as water. For this process, the organelle requires a lot of oxygen to convert the Hydrogen Peroxide into Hydrogen Dioxide.