

Topic: Cell Structures

Learning Objective/Outcome: describe the structures and functions of cell organelles.

Keywords/Questions	Notes
Describe plasma membrane and its function.	The plasma membrane surrounds the cell to contain its fluids (cytoplasm) and organelles. The plasma membrane regulates interactions between the cell and the environment; allowing nutrients to enter and wastes to exit
What is phospholipid bilayer?	The plasma membrane is made of a phospholipid bilayer. A single phospholipid has a hydrophilic head and a hydrophobic tail. A phospholipid bilayer contains two connected layers of phospholipids with the tails of each layer meeting.
How do plasma membranes work?	The hydrophilic heads attract water into the membrane and are then propelled away by the hydrophobic tails. Lastly the water is pulled across the membrane by the 2 nd hydrophilic head.
Describe the difference of hydrophilic and hydrophobic.	Hydrophilic means water loving and attracts water molecules while hydrophobic means water fearing and pushes water molecules away.
What does cytoplasm consist of?	Cytoplasm refers to the contents inside cells which consists of three things: cytosol, cytoskeleton, and organelles.
Describe cytosol and cytoskeleton.	Cytosol is a gel-like fluid that fills the cell, holds organelles in place, and aids in waste break down and energy transformation (metabolism). The cytoskeleton is a vast network of proteins ("microtubules") that support the cell's shape like a skeleton and serves as roads for organelles to travel along.
What is an organelle?	Organelles are specialized subunits within cells that perform specific functions. They can be thought of as "Little Organs" within the cell
Describe a cell nucleus and its function.	A spherical membrane-bound organelle that holds the cell's genetic material (DNA) and acts as the cell's "brain", as it tells the rest of the cell how to function and what to do.
What is chromatin?	Chromatin is a mass of genetic material composed of DNA and proteins that condense to form chromosomes. This is found inside of the nucleus and acts as the instruction manual for the cell.

Describe the function of the nucleolus in the nucleus.	The nucleolus is a dense, protein-rich region within the nucleus that produces subunits to form ribosomes. It is visibly darker than the rest of the nucleus
What is the function of ribosomes?	Ribosomes are non-membrane bound structures which receive directions from the nucleus on how, when, and in what order to make specific proteins. They are free floating in the cytosol or bound to the Endoplasmic Reticulum
Describe endoplasmic reticulum.	The Endoplasmic Reticulum is a series of folded membranes which process proteins and sends them to the cell membrane to be exported.
What are the two types of endoplasmic reticulum and their functions?	There are two types: Smooth ER has no ribosomes and processes substances like lipids Rough ER is studded with ribosomes located next to the nucleus proteins created here are pushed into the sacs for processing
What is Golgi apparatus?	Also known as the <i>Golgi Body</i> or <i>Golgi Complex</i> , are stacked, flattened membranes which process and modify proteins that are then packaged into vesicles.
Describe vesicles.	Vesicles are small membrane-bound sacs that carry products across the cell
What is the function of mitochondria?	Mitochondria are oval-shaped structures with folded internal sides giving them a large internal surface area. The site of respiration which is the conversion of chemical energy stored in food (primarily glucose) into ATP (the cell's energy source), CO ₂ , and H ₂ O.
What is the function of lysosomes?	Lysosomes are fluid-filled 'bags', containing digestive chemicals for breaking down food molecules, cell wastes, and worn-out cell parts. Some materials are recycled and reused by the cell others are removed from the cell. They also defend against infection.

Summary

The cell is a complex structure that has many different responsibilities. Each of these responsibilities are delegated to a different structure and are specialized to ensure for maximum efficiency. These structures are crucial to the proper function of the cell and therefore to our whole bodies. Understanding their role and importance is necessary in order to move on to more complex structures within the biological sphere.