Cells Notes

The cell is the basic structural and functional unit of all known living organisms. It is the smallest unit of life that is classified as a living thing, and is often called the building block of life. Organisms can be classified as unicellular (consisting of a single cell) or multicellular (consisting of many cells). Cells take in raw materials, process it into new molecules and make use or transport the raw materials to other parts of the body.

The prokaryote cell is simpler and smaller than a eukaryote cell, lacking a nucleus and most organelles. It exists singly as an independent organism, showing all the characteristics of life. E.g. of prokaryotes are bacteria and archaea. The nuclear material of prokaryotic cell consists of a single chromosome that is in direct contact with the cytoplasm. Plants, animals, fungi, slime moulds, & algae are all eukaryotic. These cells are about 15 times wider than a prokaryote and can be as much as 1000 times greater in volume. They are modified to perform a specific function in the organism. The major difference between prokaryotes and eukaryotes is that eukaryotic cells contain membrane-bound organelles in which specific metabolic activities take place.

The protoplasm is the living matter of a cell that is surrounded by a plasma membrane (cell membrane).

Cell Parts

- Nucleus- The cell nucleus is the most noticeable organelle found in a eukaryotic cell. The nucleus controls cell activities and repairs worn-out parts. It houses the cell's chromatin and is where cell division occurs. Each chromatin is made up of proteins and deoxyribonucleic acid (DNA), where hereditary information is stored. During cell division, the chromatin threads condense and become called chromosomes, which are thick rod-shaped structures. The nucleus is spherical and separated from the cytoplasm by a double membrane, called a nuclear envelope, which isolates and protects the nucleoplasm, which contains a cell's DNA, from various molecules that could accidentally damage its structure or interfere with its processing. The nucleolus, which is the core of the nucleus, produces proteins in the cell. In prokaryotes, DNA processing takes place in the cytoplasm.
- Cytoplasm- It is cytosol (gel-like substance) residing between the cell membrane holding all organelles. All the contents of prokaryotes (which lack a nucleus) are contained within the cytoplasm. The cytoplasm is 80% water and usually clear in colour. It is within the cytoplasm that most cellular activities occur.
- Cell membrane- It is a biological membrane that separates the interior of all cells from the outside environment. The basic function of the cell membrane is to protect the cell from its surroundings. Cell membranes are also involved in cellular processes, e.g. cell adhesion, ion conductivity and cell signalling (Interaction with the environment and other cells around them. It detects signals with cell receptors and the signalling molecule binds to the receptor as its shape