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CELL SHAPE

CELL (ULTRA STRUCTURE)

There is a great amount of variability in cells with respect to the cell shape. Some cells like amoebae and leukocytes change their shapes frequently. Other cells have a typical shape. For instance, some bacteria are rods, spiral and even comas. Various algae like diatoms and desmids take up varied shapes. Another important single-celled alga is Acetabularia, which consists of a stalk and a cap making upto 10 cm in height.

In multicellular organisms the shape is partly controlled by the pressure the cells exert against each other so that when isolated in a liquid these cells may become spherical according to the laws of surface tension. Confirming to this, leukocytes are spherical in circulating blood, but in other conditions may produce pseudopods and thus may become irregular in shape. Cell shape also depends upon the function, a cell has to perform. For instance, cells ~~the~~ like glandular hairs on a leaf, the guard cells of stomata, and root hair cells have their special shapes. Stability to the cells shape is provided by the cytoskeleton associated with the inner surface of

the plasma membrane of the cell. This is described as "membrane skeleton".

Cell Size: cell size varies greatly in various plants and animals. The smallest cells are found in bacteria (cell diameter: 0.2 μ – 5.0 μ). This size is perhaps the limit of resolution of the light microscope. The largest cell is the egg of an ostrich which can measure as much as 6 inches in diameter around the outside and 3 inches when the shell is removed. The largest cell, therefore, is about 75,000 times bigger than the smallest bacterial cell. The bacteriophage or viruses are still smaller in size, but they are not considered to be cellular in their organization.

The cell size also depends in many cases on the size and the number of chromosomes. In many cases it has been proved that when the chromosome number is artificially doubled, the cell size automatically increased.

It has been emphasised that the cell size remains constant during evolution

characters may change. One of the possible reasons for this could be that when the cell size increases, the increase in the volume of the cell is much more than the area of cell surface (volume increase as cube of radius, while surface area increases as square of radius). Due to disproportionate increase in cell volume and surface area, adequate area for exchange of material for the increased volume may not be available. It is for this reason that metabolically active cells tend to be smaller in size.

In human body, with the exception of some nerve cells, the cell volume ranges from 200 μ^3 to nerve cells, the cell volume ranges from 200 μ^3 to 1,500 μ^3. In general the cell volume is constant for a cell type and does not depend on the organism. For instance, kidney cell in bull, horse or mouse are of same size and the difference in size organisms depends on the cell number only. This is sometimes called the law of constant volume.