

1. Anatomy of the Cell. The cell is of varying shape and size in accordance with its specialized function or location. It is bounded by a protoplasmic film called the plasma membrane and it may have a non-protoplasmic, true membrane or wall. Contained within the membrane are the two important parts of the cell--cytosome and nucleus.

a. Protoplasm is that peculiar material which possesses the properties the sum total of which is L-I-F-E. Chemically it is a complex mixture of proteins, lipoids or fatty bodies, carbohydrates, inorganic salts, and water. Physically it displays the properties of a complex colloidal system and behaves as a viscid liquid, sometimes colored, but often practically colorless. The cytosome and nucleus are composed of various kinds of protoplasm. "Cytoplasm" and "nucleoplasm" express this fact.

b. Cytosome

Within this protoplasm (cytoplasm) are a number of organized, visible structures some of which participate in cell division while others are either formed anew by each cell or are inclusion bodies only.

c. Nucleus is usually surrounded by the cytosome and varies in shape. It always contains a peculiar protein material known as chromatin believed to be the specialized vehicle which transmits hereditary characteristics.

(1) Chromosomes. Within the nucleus the tiny granules of chromatin are arranged in units called chromosomes. These are the units of mechanism for the transmission of life in accordance with the laws of heredity.

(2) Function and Number of Chromosomes. The cells of various species have a characteristic and fixed number and variety of chromosomes. This number is spoken of as "diploid." The human fertilized ovum has 48 and every resultant cell has 48 chromosomes.

When a new individual is to appear, the germ cell of each parent loses one half of its chromosomes and contributes the other half to the union. By this means heredity goes back through the ages to the beginning of life.

2. Physiology of Cells.

"Physiologically, we note that, in general, all cells exhibit (a) synthetic functions, that is, anabolic or constructive functions, that are performed chiefly by or because of the nucleus; and (b) dissociative functions, that is to say, destructive or katabolic functions that are performed chiefly by the cytoplasm. Thus the nucleus is chiefly an organ of growth, construction, repair, reproduction, and heredity. The cytoplasm is chiefly an organ of power-production and dynamic service through energy transformations."--Thomas A. Storey "Principles of Hygiene."