

Findings in biomedical sciences



Abstract

The cell is the basic unit of living organisms; while some organisms are made up of a single cell (bacteria, protozoa) others are made up of many cells, organized into tissues and organs that perform specific functions. Individual cells in humans and other eukaryotic organisms are organized into functional areas-organelles-that perform a specific function. Cells usually divide by mitosis to produce identical daughter cells to allow the development of tissues or the replacement of dying cells. However, for reproduction, they divide by meiosis in which the daughter cells each possess half a full set of chromosomes. In developed tissues, mitosis occurs to replace those cells that have become damaged; if such cell division occurs in an unregulated fashion, cancer may result.

The cytology or cell biology is a biological science that deals with the study of cells from morphological, biochemical, physiological, developmental, generically, pathological, and evolutionary points of view. Recently, it has shown rapid progress and has become fundamental in the study of the structure and function of a living organism and the anatomic and physiologic substrates of biological phenomena. In its morphological aspect, modern cell biology has gone beyond a simple description of structures visible to the light microscope; by the application of new methods, an analysis has been started of sub-microscopic organizations-the architectural arrangements of the molecules and miscalls comprising living matter.

In the functional aspect, it has transacted the stage of the pure description of Physiologic changes and seeks an explanation of them in the intimate physico-chemical and metabolic processes of protoplasm.

Keywords: Organisms, mitosis, phospholipid bilayer, haploid medicine, biomedical cells

Description

■ Structure and function

A cell contains specialized regions that take on specific functions. These organelles are discussed below however, the biochemical interactions that occur are discussed in more detail. The cell membrane is a phospholipid bilayer that surrounds the cell, defining its boundaries. The membrane contains many specialized molecules embedded within it, for the transport of molecules across it, as well as regulating the properties and behavior of the membrane itself.

■ Cell division and cell cycle

Everyone develops from a single zygote as a result of cell division, differentiation, and cell death. During the proliferation required for this development, cells divide to produce two daughter cells that contain the full complement of chromosomes-diploid cells. This form of cell division is named mitosis.

During reproduction, a sperm and an ovum, which express only one copy of each chromosome, must fuse to produce a zygote that

bears a full complement of 46 chromosomes. The production of the haploid cells that contain only one copy of each chromosome is essential for reproduction and occurs by meiosis.

Some cells are constantly replenished throughout an individual life as a result of cell division, e.g. epithelial cells are constantly sloughed off as a result of wear and tear and must be replenished by the division of stem cells and their differentiation. Finally, we can say that modern cytology or cell biology is attempting to interpret and explain the phenomena of metabolism, biosynthesis, heredity, sex, variation, mutation, and evaluation of living organisms in terms of molecules or macromolecules such as protein, Ribonucleic Acids (RNA) and Deoxyribonucleic Acid (DNA).

Modern cell biology involves the weaving together of three distinctly different strands into a single cord. Each of the strands has its historical origins and most of the investigating had occurred only within the last 75 years. Each strand should be appreciated in its own right because each makes its own unique and significant contribution.

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