Dr.Md Saifullah Fahim

Asst.Professor & Head Deptt.of Botany,AL-Hafeez college ,Arrah

B.Sc Part 1 Paper 2

Historical background of cell Biology

Cell is the fundamental structure and functional unit of all living organism,also known as the basic unit of life.

Every cell is capable of forming the whole individual. The potential of forming the individual is called Totipotency.

Life exists only in the form of cells.

Father of Cytology- Robert Hook.

Father of Indian Cytology- Arun kumar Sharma

Father of modern Cytology - Swanson.

Cytology - Cytology is a branch of biology that studies the structure and function of plant and animal cells.

Father of cell Biology- Laureate George Palade

These days cytology has been replaced by cell biology.

Cell Biology is a branch of biology that deals with the study of structure, biochemistry, physiology, reproduction,evolution and function of the cell.

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A number of biochemical technique are used in the study of cell biology

The Cell theory states that all organisms are composed of similar units of organization, called cells.

The concept was formally articulated in 1839 by Schleiden & Schwann and has remained as the foundation of Modern Biology.

First Cells Seen in Cork

The term cell was introduced by an English scientist Robert hook in his book Micrographia published in London 1665.with this he launched the study of microscopic anatomy.

He examined thin slice of cork under a primitive microscope he had assembled.

He saw tiny empty compartments in the slices of cork. He called them cellulae or cell.

(Greek word cella = small hollow space or chamber)

Hooke's description of these cells was published in *Micrographia.*

The cell walls observed by Hooke gave no indication of the nucleus and other organelles found in most living cells.

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The first man to witness a live cell under a microscope was Anton van Leeuwenhoek, who in 1674 described the algae Spirogyra.

Van Leeuwenhoek probably also saw bacteria.

Formulation of the Cell Theory

The botanist M.J Schleiden and the zoologist Theodor Schwann first proposed the cell theory in 1839 out of their parallel and independent studies of the tissues of plant and animals

He summarized his observations into three conclusions about cells:

1. The cell is the unit of structure, physiology, and organization in living things.
2. The cell retains a dual existence as a distinct entity and a building block in the construction of organisms.
3. Cells form by free-cell formation, similar to the formation of crystals (spontaneous generation).

We know today that the first two tenets are correct, but the third is clearly wrong.

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The correct interpretation of cell formation by division was finally promoted by others and formally enunciated in Rudolph Virchow's(1858) powerful dictum,

Omnis cellula e cellula,: ""All cells only arise from pre-existing cells.

Modern Cell Theory or Cell doctrine-

1. All known living things are made up of cells.Cells are unit of structure or building blocks of the body of all living organism.
2. The cell is structural & functional unit of all living things.
3. All cells come from pre-existing cells by division. (Spontaneous Generation does not occur).
4. Cells contains hereditary information which is passed from cell to cell during cell division.
5. All cells are basically the same in chemical composition.
6. All energy flow (metabolism & biochemistry) of life occurs within cells.
7. Due to presence of complete genetic information, each cell is totipotent or capable of forming whole organism.
8. Cells maintain homoeostasis and their own internal environment.

To be Continue Lecturer.....