06/02/23 B.Sc Part-I Zoology Hons: Dr. Pritam Kumar

CONCEPT OF PROKARYOTIC & EUKARYOTIC CELLS.

PROKRYOTIC = PRO — BEFORE & KARYON — NUCLEUS.

EUKARYOTIC = EU — TRUE & KARYON — NUCLEUS.

Q: Define cell. Give a brief account of its variable Shape and Size. Describe differences b/w Prokaryotic and eukaryotic cells.

ANS:— DEFINITION → A Cell is the smallest but Complete unit of fundamental biological organisation as well as function of living organisms, bounded by a Semi-permeable membrane and is capable of independent existence and multiplication.

THE CELL (Cellula — hollow space)

"Cell is the structural, functional and hereditary unit of life."

ROBERT HOOKE (1665):— Discovery of cell in the form of Cellula (empty space) in Cork.

SHAPE — (I) The shape of the cells may be variable or fixed.

(II) it is variable in case of Amoeba and Leucocyte

(III) The shape of the cells having a fixed shape. So cells vary greatly in their shape.

These may be categorised into following types:—

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(1.) Flattened :- Squamous epithelium

(2.) Cubiodal :- Follicles of thyroid gland.

(3.) Columnar :- Inner layer of Intestine.

(4.) Discoidal :- Erythrocytes. (different vertebrates).

(5.) Polygonal :- Liver cells, urinary bladder.

(6.) Spindle shaped :- Smooth muscles

(7.) Spherical :- Eggs.

(8.) Elongated :- Nerve cells.

(9.) Branched :- Pigmented cells.

SIZE —: Cell Size also varies greatly. The smallest cells are found in Bacteria (measuring about .15 µ to 15 µ). The smallest organism observed is pleuroneu-monia like virus mycoplasm galicseptium which causes a type of pneumonia in cattle and mes about - 0.1 µ in diameter. But viruses are not considered to be cellular in their organisation.

The most cells are microscopic and some of them are large to be seen by naked eye such as eggs of birds like duck, hen etc. The egg of ostrich mesures about six inches in diam-eter around the side and three inches when the Shell is removed.

In human body Cell Size ranges from 3-4 µ (leucocytes) to over a meter (nerve cells).

Differences b/w Prokaryotic and Eukaryotic Cells:

PROKARYOTIC CELLS	EUKARYOTIC CELLS
(1.) They lack nuclear membrane & D.NA present free in cytoplasm (nucleoid).	DNA is covered by Nuclear membrane hence nucleus is present.
(2) Membrane baunded organ-elles are absent	membrane baunded organ-elles are present.

(3). Chromosome Compound of only DNA.	Chromosome Compound of protein & DNA.
(4). Ribosomes Consist of 50S and 30S Sub units, and are of (70S) - Category.	Ribosomes Consist of 60S and 40S Subunits, and are of (80S) - Category.
(5) Respiration occurs in mes-osome plasma membrane. (Infolding structure) eg - Bacteria.	Respiration occurs in mitochondria (organelle). eg:- plants & Animals. Fungi, Algae etc.
(6) Nucleolus and mitotic apparatus are Completely absent.	Nucleolus and mitotic apparatus are present.

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