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Concept of Prokaryotic & Eukaryotic Cell.

Cell Biology or Cytology is one of the youngest-branches of Life Science.

- It deals with the study of cells from Morphological, Biochemical, Physiological, Developmental, Genetical, Pathological, & Evolutionary point of views.
- Robert Hooke (1665) was first to coin the term 'Cell' for the empty compartments, which he observed in a thin section of dead cork under compound-microscope.
- Leeuwenhoek (1674) was first to observe cells. eg. Bacteria, Protozoans, Blood cells, Sperm etc under microscope.
- Schleiden & Schwann (1839) proposed 'Cell-Theory', i.e. all living organisms (Plant or Animals) are composed of cells. Thus cell may be defined as; "Smallest structural and functional organized unit of all living organisms & capable of independent existence, growth & self reproduction in a medium free of other living systems."

Size - Smallest - smallest - 0.1 μ of PPLO (Parvovirus-like organism) or Mycoplasma, to largest - 17.5 cm of Egg of Ostrich. Certain Giant algae cell are 10 cm long.

- Minimum size of true cell has been theoretically calculated to be 0.05 μ . The resolving (distinguishing) power of unaided human eye is 0.1 mm or 100 μ (mm).

- Shape - dts of two types: ① Changing - Amoeba, & Leucocytes.

② Fixed - Most plant & animal cells have a definite shape. Fixed cells are of variable shape flattened, cuboidal, columnar, spherical, discoidal, oval, spindle-shaped, tubular, elongated,

Prokaryotic cellEukaryotic cell.

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|---|---|
| <ul style="list-style-type: none"> - Genetic Material (DNA) consists of circular DNA. free from histones protein <u>histones</u> (nucleoid) | <ul style="list-style-type: none"> - DNA is associated with basic proteins called - |
| <ul style="list-style-type: none"> - Its respiratory enzymes or enzymes of ETS are associated with P.M. | <ul style="list-style-type: none"> - Its respiratory enzymes are found in mitochondria membrane. |
| <ul style="list-style-type: none"> - DNA lies in cytoplasm. | <ul style="list-style-type: none"> - DNA lies in nucleoplasm. |
| <ul style="list-style-type: none"> - Cell wall (C.W) has Amino-sugars & <u>Chromic acid</u>. | <ul style="list-style-type: none"> - Cell wall lacks of-sugars & <u>Chromic acid</u> (Amino) |
| <ul style="list-style-type: none"> - It has no mitotic apparatus | <ul style="list-style-type: none"> - Mitotic apparatus is present. |
| <ul style="list-style-type: none"> - Its characteristic of Blue green algae, & <u>Bacteria</u> (Smallest 0.1 μ to largest 15 μ, of <u>spiroillum volutans</u>, <u>Bacterium</u>. | <ul style="list-style-type: none"> - It is characteristic of all animals & plants, except - Blue green algae & Bacteria, (Smallest - 1 μ to largest - 175 μ of <u>egg of ostrich</u>, <u>Crab</u> - these cells are 1.5 cm long. |