DIFFERENCE BETWEEN PROKARYOTIC CELL & EUKARYOTIC CELL

SUBMITTED BY

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DIFFERENCE BETWEEN PROKARYOTIC CELLS AND EUKARYOTIC CELLS

SYNOPSIS

- Introduction
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- Types of the cell
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All living organism whether they are small like microscopic amoeba or very big like a banyan tree or elephant are made up of one or more than one cells.

That cell is the fundamental basic unit of all living organism. This builds the body structure and carriers life function, in unicellular organism. The single cell performs all life activities.

DEFINITION OF THE CELL

- ‘’A cell is the structural and functional unit of a living body.”
- “Cell is basic unit of life.”
- ‘’The cell as a unit of biological activity surrounded by permeable membrane and capable of self reproduction in a medium free or other living system.”

DIFFERENCE BETWEEN PROKARYOTIC CELL AND EUKARYOTIC CELL

HISTORY OF THE CELL

ROBERT C. HOOKE	1653	Discovered the cell
ANTONI VAN LEEWENHOCK	1682	Seen cells and described the cell nucleus
ROBERT BROWN	1831	The cell nucleus and suggest its important in fertilization
SCHWANN AND SHLEIDEN	1839	They propose that all living things are entirely made up cells
RUDOLF VIRCHOW	1858	They propose cell division and its role in pathology.

DIFFERENCE BETWEEN PROKARYOTIC CELL AND EUKARYOTIC CELL

PROKARYOTIC CELL

- Prokaryotic cell it is the primitive type of cell.
- They do not have intracellular membrane that is no compartmentalization of the cells.
- Even the genetic material on “nucleus” is not enclosed in the nuclear membrane.
- There is the no nuclear membrane.

STRUCTURE OF PROKARYOTIC CELL

E.g.--- BACTERIA

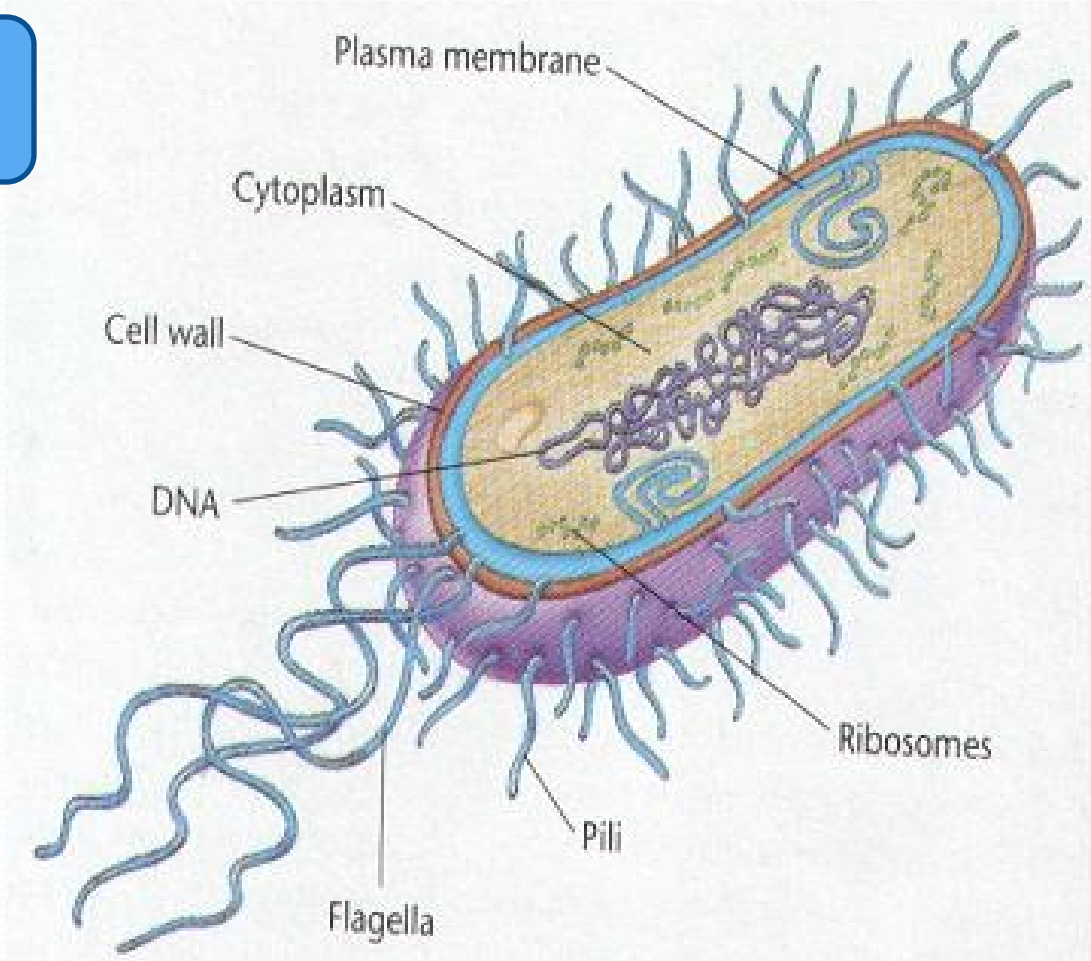

Fig --- 1

Capsule

- It is made up of polysaccharides and polypeptides.
- Capsule protects bacteria from phagocytosis.
- Slime layers can also be used as a food reserve the cell.

Cell wall

- With very few exceptions all bacteria have cell wall found just outside the cell membrane.
- Cell wall gives prokaryotes shape and protection.

plasma membrane

- Selectively permeable barriers, mechanical boundary of cell nutrient and waste transport.
- Location of many metabolic process (respiration, photosynthesis

Flagella

- By the flagella bacterial cell doing movement.
- They are made up of contractile protein called flagellin.
- Bacterial cells have hair like structure called flagella.

Pili

- Straight stiff projection from cell found in some bacteria.
- Sex related function. Bacterial sex called conjugation. And bacterial tube between to bacterial cells.

ARCHAEA BACTRIA

ARCHAEA

- These are also called ‘’ancient bacteria’’ or’’ living fossils’’
- There cell wall is unique. It consists of protein and polysaccharides.
- It tolerates extreme heat or pH.

It is classified into three main groups

- Methanogens
- Halophiils
- Thermoacidophiles

Halophiles

- These anaerobic salt lovers which occurs in extreme saline environments such as salt lakes, salt pans, salt marshes.
- some halophiles occur in deep sea volcanic vents at 110c, a tempeture at which the water remains liquid because of extreme hydrostatics pressure.

Methanogens

- The methanogens can be found in the anaerobic environments rich in organic matter.
- It is also responsible for production of methane in biological plants.

Thermoacidophils

- These archaeobacteria live where it is both hot and acidic, such as hot springs where tempeture remains around 80c and ph around 2(highly acidic)
- Under aerobic condition these organisms oxidize sulphur to sulphuric acid.

DIFFERENCE BETWEEN PROKARYOTIC AND EUKARYOTIC CELL

EUKARAYOTIC CELL

- The eukaryotic cells have well developed nucleus.
- Animals and flowering plants having definite nucleus in their cells are known as eukaryotic cell.
- There cell contain nuclear membrane which surrounds the genetic material to form nucleus.
- Typical eukaryotic cells consist of jelly like translucent protoplasm enclosed in plasma membrane.
- The eukaryotic cell has well developed organelles' like mitochondria, golgibody, endoplasm reticulum, ribosome, lysosoms etc.
- Nucleus is the controlling centre of cell.

DIFFRENCE BETWEEN PROKARYOTIC AND EUKARYOTIC CELL

STRUCTURE OF PLANT CELL

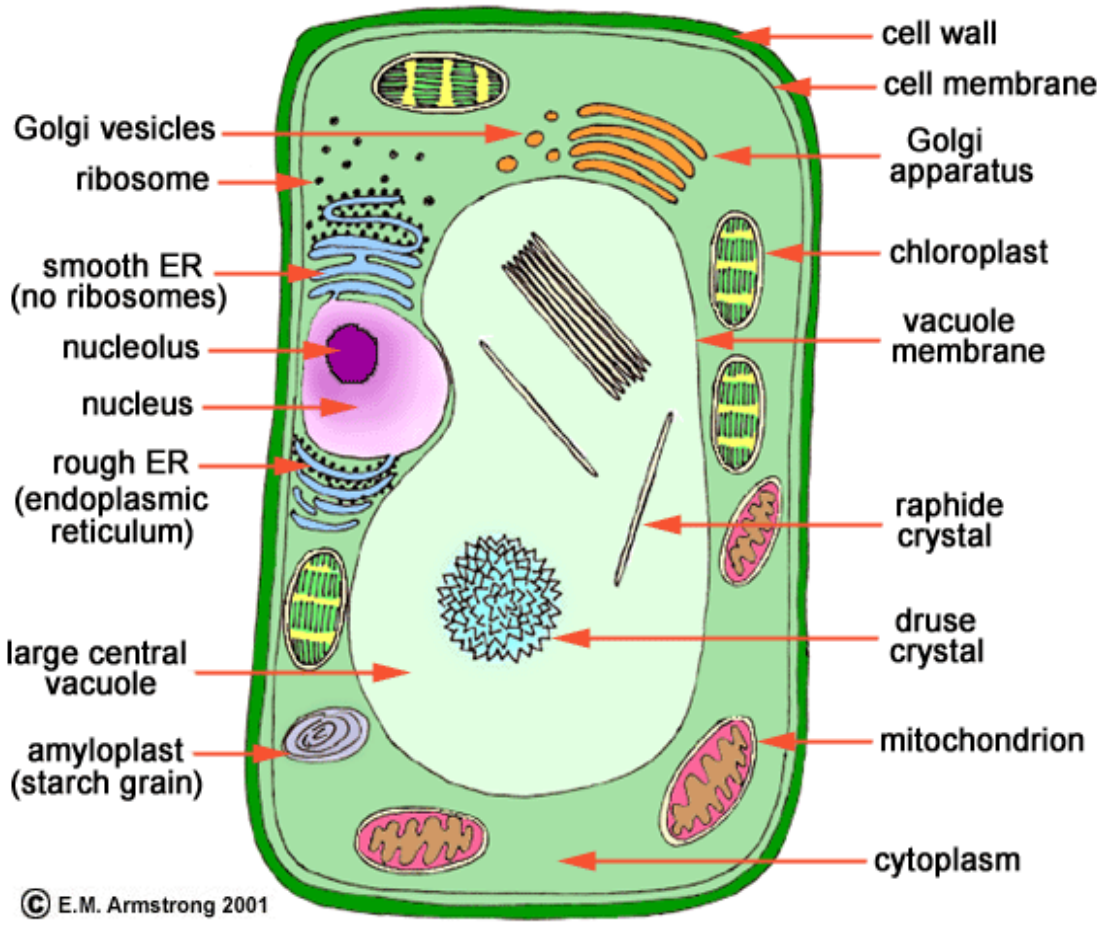

Fig --- 2 structure of plant cell

Nucleus

- It is supposed to be the most important organelle.
- It carriers the genetic information.

Cytoplasm

- The cytoplasm of a cell is the ground substance or matrix which is jelly like material out side of cell
- Cytoplasm is a colorless, semi- transparent, thick and sticky liquid.

Cell membrane

- Similar to a nuclear membrane, the main cell membrane function is to give the cell an appropriate shape and size.
- This thin membrane is made up of cellulosic fibres and proteins.
- Its main function is transport of material through cells.

Plastids

- Another peculiar organelle present in plant cells are the plastids.
- plants prepare their own food with a unique process called photosynthesis with the aid of these plastids.
- The plastids consist of pigments which absorb light and make food.
- The most common plastid is chloroplast containing the green pigment chlorophyll.

Mitochondria

- Mitochondria are among the largest cell organelles known as the engine house or the energy house of the cells These organelles also known as the cells.

Ribosome

- Ribosome's is the main site for protein synthesis since these are rich in ribonucleic acid.
- These organelles could be bound to the endoplasmic reticulum or free folding in the cytoplasm.

Golgi apparatus

- Golgi membranous sacs associated with endoplasmic reticulum release protein chains after processing them.
- the proteins formed and bounded by endoplasmic reticulum need to be

Vacuoles

- Plant cellar characterized by larger and lesser numbers of vacuoles and mainly responsible for maintaining the fullness of a cell.
- The alternative function of these is to store ions, sugars and secondary metabolites

STRUCTURE OF ANIMAL CELL

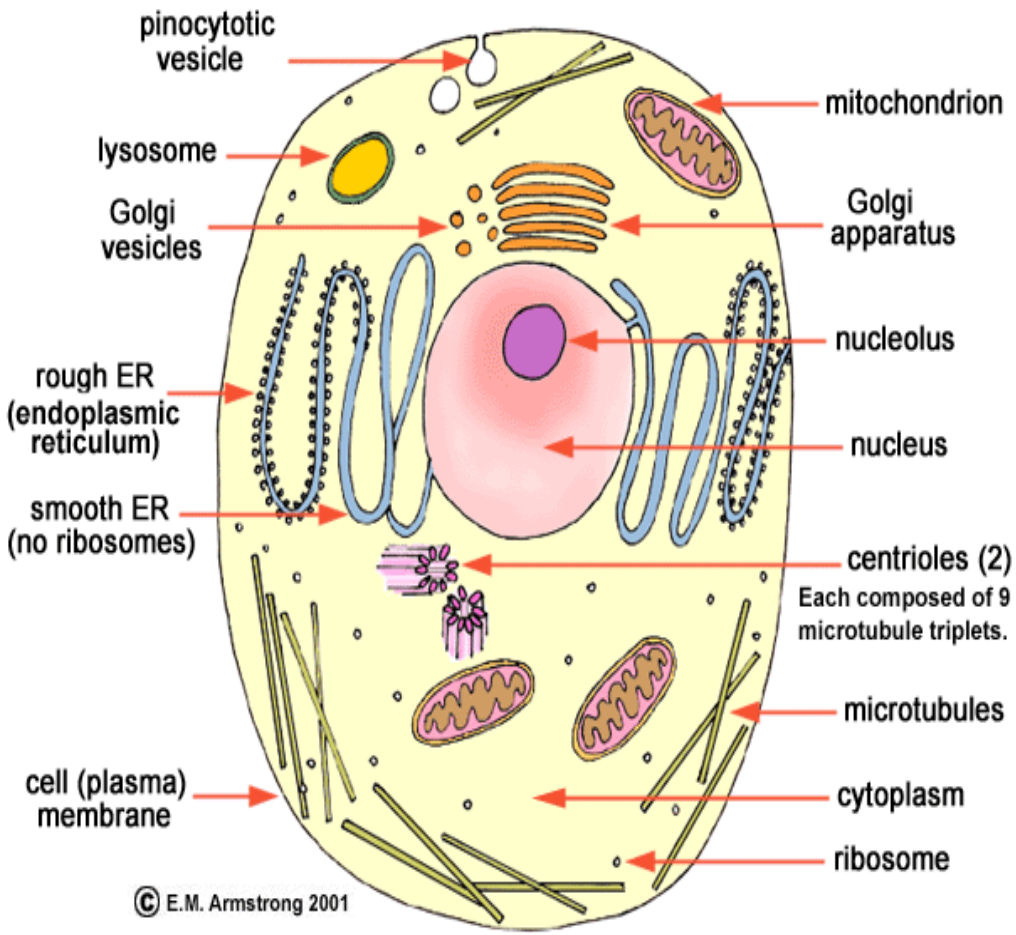

Fig--- 3 structure of animal cell

Plasma membrane

- Each animal cell remains surround by a very thin transparent membrane, which is called plasma membrane Or cell membrane.
- It is made up of double layer of protein and lipid molecules.
- It is differential permeable membrane.

Cytoplasm

- The space present between the cell membrane and nucleus is filled with a translucent jelly like fluid, which is called as cytoplasm.
- The cytoplasm is the fundamental substance of the cell.
- Cytoplasm is the colorless, semi transparent, thick and sticky liquid.

Endoplasmic reticulum

- It is absent in all type of mammals eggs and embryonic cells.
- The endoplasmic reticulum is two types.
- There is no ribosome's attached to its smooth endoplasmic reticulum it.

Mitochondria

- Mitochondria are among the largest cell organelles known as the engine house or the energy house of the cells. These organelles also known as the cells.
- These organelles provide the energy required for all the cellular activities by breaking down complex.

Nucleus

- it is the most important part of the cell
- it controls the cell activity and contain all the genetic material.
- Nucleus is the control room of the cell.
- It was discovered by the Robert hook (1653) in orchid cell.

Nucleolus

- It is involved in the synthesis of ribosomal RNA.
- It is dark body inside the cell.

Ribosomes

- Ribosome play in imp role in protein synthesis.
- Ribosome's are found in the form of polysomes. Thus the protein synthesis occurs at higher rate
- Ribosome's are called as the protein factory of the cell.

Golgibody

- It is a apparatus or complex store and package cellular.
- secretion for export out of the cell usually through there vacuoles.
- Lysosomes are formed from Golgi bodies.

Lysosomes

- It digest and remove the extracellular particles like foreign particles, proteins bacteria, and viruses.
- They vacuoles filled with digestive enzyme.

Centrioles

- It found in all animals cell except mature mammalian RBCs.
- They are composed of microtubules and are found in only animal cells.

DIFFERENCE BETWEEN PROKARYOTIC CELL AND EUKARYOTIC CELL

DIFFERENCES

CHARACTER	EUKARYOTIC	PROKARYOTIC
NUCLEUS	present	absent
NUMBER OF CHROMOSOME	More then one	One but not true chromosome
CELL TYPE	multicellular	unicellular
TRUE MEMBRANE BOND NEUCLEUS	present	absent
EXAMPLE	Animals and plants	Bacteria and Archaea
LYSOSOMES	present	absent
MICROTUBULES	Present	Absent

DIFFERENCE BETWEEN PROKARYOTIC AND EUKARYOTIC CELL

DIFFERENCES

ENDOPLASMIC RETICULUM	present	absent
MITOCHONDRIA	present	absent
RIBOSOMES	larger	smaller
VESICLES	present	present
GOLGI APPARATUS	present	absent
CELL SIZE	10-100µm	1-10µm
CHLOROPLAST	Present in plant cell	absent
CELL WALL	Only in plant cell	Usually chemically complex

SUMMARY

- The plant body is composed of cells and their products.
- All plants cells are surrounded by a rigid cell wall that is produced by the cell, Inside the cell membrane. Which selectively regulates the movements of materials into and out of the cells.
- Plant cells are compartmentalized into organelles that are structurally organized to support their function, the nucleus, chloroplast, ribosome's and vacuole are example of plant cell organelles.

CONCLUSION

- In conclusion, cells are the basic building blocks of life.
- They have been linked to the development of life on planet earth even before there were animals or humans.
- Cells make us who we are and how we operate day to day function. The definition of biology is the study life of living of organisms structure ,function,growth and evolution.

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THANKYOU