

B.Sc. II SEM: e- content

Topic ...Cell biology: Cell Organelles

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Endoplasmic Reticulum

In the cytoplasm of all eukaryotic cells is found extensive system of tubules called endoplasmic reticulum.

The term endoplasmic reticulum was coined by PORTER 1953

It is found in all eukaryotic cells except mature rbc's, embryonic cells and egg cells. Their synthesis takes place from microtubules. They are formed from cisternae or tubules and covers most of the area of cytoplasm .

Endoplasmic reticulum are of two types

ROUGH endoplasmic reticulum

SMOOTH endoplasmic reticulum

Rough endoplasmic reticulum is associated with ribosomes in cytoplasm for protein synthesis.

Whereas Smooth endoplasmic reticulum is engaged in synthesis of lipid etc.

Endoplasmic reticulum of muscles is called sarcoplasmic reticulum

Functions

Its tubules increases the surface area of cytoplasm for metabolic activities.

Space between two membranes of EPR is used for storage of product synthetised.

During cell division EPR is the source of nuclear membrane.

Protein synthesis , lipid synthesis, It forms the cytoskeleton of cell as various enzymes are associated with its surface or within the space.

Lysosomes or Suicidal bags

Lysosomes were discovered by DeDUVE in 1952 .

They are single membrane spherical bodies found in the cytoplasm of almost all eukaryotic cells except RBCs.

Granulocytes, Leucocytes are the rich source of lysosomes, their phagocytic activity depends upon the number of lysosomes they have in their cytoplasm.

Lysosomes are meant for intracellular digestion of foreign bodies as well as cells own weak cellular components.

They destroy themselves and pour their secretion on the material to be hydrolysed, hence they are called suicidal bags.

Some hydrolytic enzymes are phosphatases, hydrolases, ribonucleases etc.

Their enzymes are derived from ribosomal activity on REPR.

They are 0.5 to 0.2 micron in diameter normally ,but their shape varies hence they are polymorphic.

They are derived from secretory vesicles of golgi bodies.

Primary lysosome freshly formed lysosomes

Hetero lysosomes or secondary lysosomes which comes in contact of vacuole containing material to be phago cytised.

Autophagosomes which lysosomes their own cell organelles (Autolysis)

Residual bodies or telolysosomes in which incomplete digestion occurs due to shortage of lysosomal enzymes

Functions

Intracellular digestion

Autolysis or Autophagy

Extra cellular digestion During fertilization sperm releases enzymes to digest limiting membrane of an ovum and make passage for sperm to enter into it.

PEROXISOMES

Peroxisomes are single membrane bound organelles found in the cytoplasm of eukaryotic cells .

They contain several enzymes required for the break down of toxic materials like alcohol.

It breaks down hydrogen peroxide by catalase into hydrogen and oxygen, later hydrogen combines with oxygen to form water.

Peroxisome converts ethanol into acetaldehyde in hepatocytes.

Functions

- 1 Breakdown of fatty acids to be used for formation of membranes
- 2 Transfer hydrogen from compounds to oxygen forming hydrogen peroxide and then water finally.

