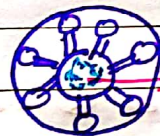


① Peroxisome

- named so because it is involved in H_2O_2 formation and break down by catalase
 - by urate oxidase, glycolate oxidase,
 - marker enzyme of peroxisome.
- occurrence → plant cells + animal cells.
 - metophyll cells → liver cell, kidney cell
 - 70-100 per cell
 - performs photorespiration in C_3 plants only
- possess special proteins called peroxin.

② Sphaerosome (spherosome)

- spherical
- occurrence → endosperm cells of oil seeds.
- consists of half unit membrane.
 - lipid monolayer
 - stabilized by cleosin protein



(Sphaerosome)

- function → synthesis and storage of lipid. (fat)
- may contain hydrolytic enzymes → They (Sphaerosomes) are believed to be plant lysosomes.

③ Glyoxysome

- special peroxisome.
- discovery → Tolbert, Beever.
- occurrence → germinating oily seeds like castors, groundnut.
- function → performs glyoxylate pathway (gluconeogenesis)
 - lipid (water insoluble) → sugar (glucose) (water soluble)

- In animals gluconeogenesis is absent due to absence of glyoxysome
 - ↳ from lipid \rightarrow glucose

Note: liver cell \rightarrow gluconeogenesis \rightarrow +ve

Cytoskeleton

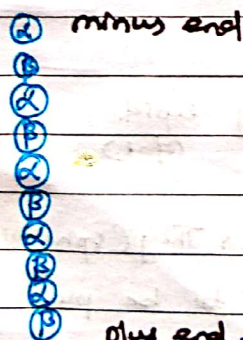
- elaborate network of proteinaceous filaments
- present in cytoplasm (in nucleus also)
 - ↳ NCERT.
- occurrence \rightarrow PK \rightarrow -ve
EK \rightarrow +ve.

- functions \rightarrow SMS \rightarrow
 - mechanical support
 - motility
 - shape.

- types \rightarrow microtubule, microfilaments, intermediate filament

① Microtubule (MT)

- polaw, unbranched, noncontractile, hollow, cylinder
- made of tubulin protein
 - globular protein
 - binds to GTP, Ca^{2+}
 - 2 types \rightarrow α , β
 - alternate chain of ② and ③



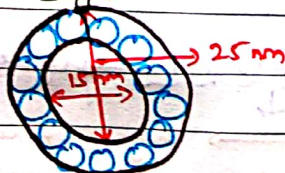
↓ forms
protofilament
↓ forms
MT.

plus end \rightarrow rate of assembly and disassembly is more than at minus end.
 (fig: protofilament) (PF) polymerisation depolymerisation

- 13 PF \rightarrow 1 MT

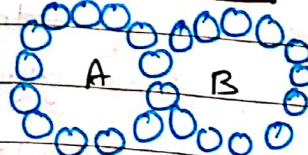
Types of MT

① Single MT



- 13 PF (complete)

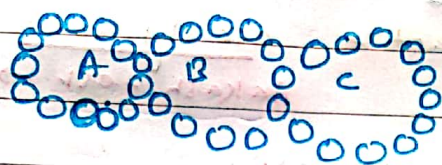
② doublet MT



- A \rightarrow 13 PF (complete)

- B \rightarrow 10/11 PF (incomplete)

(iii) Triplet MT



A \rightarrow 13 PR (complete)
B \rightarrow 10/11 PR (incomplete)
C \rightarrow 10/11 PR (incomplete)

- diameter of MT \rightarrow 25 nm (core \rightarrow 15 nm)

Functions of MT

- structural component of astrosal rays, spindle fibres, cilia, flagella, centrosome (centriole)
 - \hookrightarrow cell division
 - \hookrightarrow separation of chromosomes
 - \hookrightarrow motility
 - \hookrightarrow cell division
- determines the position of future cell plate
 - \hookrightarrow i.e. help in cytokinesis in plant cells
- provides rigidity and shape to cell.
- intracellular transport of ions and nutrients.

(iv) Microfilament (MF)

- also k/a actin filament.
- polar, unbranched, solid, contractile, rod like structure with indefinite length.
- made of actin protein
 - binds to ATP
 - 2 types \rightarrow G-actin (globular), F-actin (filamentous)
- chain of G-actin form F-actin
 - \hookrightarrow has (+) end and (-) end
- 2 F-actins form MF.
- MF diameter \rightarrow 6-8 nm

Functions of MF

- Support to PM
- pseudopodia formation
- cytokinesis in animal cell.
 - \hookrightarrow cell furrow formation.
- cyclosis (cytoplasmic streaming)
 - \hookrightarrow movement of cytoplasm.

③ Intermediate filament (IF)

- nonpolar, noncontractile, nearly solid
Alkaline test → hollow.

- made of acidic protein.

↳ e.g. lamin A, lamin B.

- occurs only in multicellular euk.

- (MT, MP → both unicellular, multicellular)
euk.

Functions

↳ acts as scaffold for chromatin
(support)

↳ forms nuclear lamina.