Continuity Of Life

Mitosis

(i) Interphase - The interval inbetween the end of cytokinesis and beginning of prophase of next round of mitosis is called interphase. It involves all the synthetic anabolic activities so that a daughter cell could gradually grows into a mother cell. to take part in cell division. Though the cell grows, There is no choromosomal changes found. Hence it is called resting phase. Nucleus in interphase stage is called metabolic nucleus.

(a) G_1 Phase -

(i) It lies inbetween the end of cytokinesis and S phase.

(ii) Huge amount of ATP, RNA and enzyme protien which are involved in RNA replication are synthesised actively

(iii) Longest phase of cell cycle

(iv) Somewhere in cell cycle, in middle of G_1, cell has to take three decision 1) wheather a cell would take part in further cell division without dead 2) Cell would take temporary recess from cell cycle. and enter

into temporary G_0 phase. 3) Cell would permanently enter into G_0 phase.

(b) S phase -

(i) It lies in between G_1 and G_2 phase. It involves replication of DNA so that single stranded chromosome become double stranded

(ii) It also involves duplication of centriole and synthesis of histone protein

(c) G_2 phase -

(i) It lies in between end of S phase and beginning of ~~of~~ prophase.

(ii) It involves synthesis of ATP, RNA, structural protein including tubuling (protine of microtubule)

Prophase. It is the longest phase in M phase.

Events :-

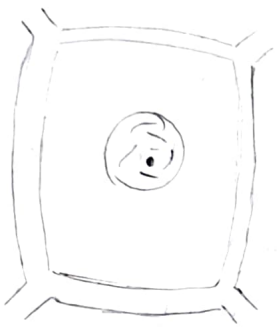
1) Chromatic reticulum becomes condensed and thickened by dehydration. They gradually become uncoeled.

2) Spiralization of chromosome takes place and they become conspicious under the ~~microscope~~ microscope.

3) With more dehydration each chromosome Longitudinally splits up into two sister chromatids that remain attached with one another along the centromial

4) In an animal cell two centrioles experience a force of repulsion but they remain connected by some microtubules. A few microtubles radiate from centriole, radiate from like the spokes of a wheel they are called as aster or astral rays

5) The neucleolus and nuclear membrane dissapear, scattering the chromosome and cytopl



Metaphase It is formed by spindal formation and allignment of chromosome.

i) Spindle formation is the most important event in this stage.

In animal cell, the two centriole migrate apart and many microtubules link between the centrioles. As a result the whole

structure takes the shape of spindle. It is called bipolar spindle.

In plant cell (higher plant) the bipolar spindle is directly formed by the cellular tubulin.

2) The region of the cell where the spindle fibre converge are regarded as poles, while the central part of the spindle forms the equator also known as equatorial plate or metaphasic plate.

3) Chromosomes now assembles at the metaphasic plate and each chromosome is attach from the spindle fibre with the help of centromial.

4) The chromosomes are more conspicous and the chromosome number in a cell is determine at the stage.

Anaphase : It is marked by the pole ward movement of chromosomes (sister chromatids)

Events

1) ALL the centromials lie attach to the spindle fibre get divided and each half is shared by sister chromatids of chromosome

2) All the chromatids are now regarded as daughter chromosome, start a pole ward journey by the gradual shrinking of spindle fibres.

3) Thus an equal set of chromatide slowly moves towards the respective pole.

Telophase : It is marked by the formation of two daughter nuclei at the two poles of the cell and all the changes occured during prophase are reversed.

1) After all the chromosome reached the poles they begin to rehydrated

2) A new nuclear membrane a nucleolus occur at each pole when the membrane covered the chromosome.

3) Desingration now occurs in spindle apparatus.

4) At the end of telophase, each pole houses a new nucleus with nucleolus, nuclear reticulum, nuclear membrane and nucleoplasm.

Cytokinesis In plant cell

1) In plant cell some microvesecles of golgi body assemble at the equatorial plate.
2) The vesecles then fuse together to form fragmoplast that appear as a dark plate along the equator which is called cell plate
3) It begins to formed from the centre and gradually eatends towards the periphery.
4) The cytoplasm of the mother cell now divide along the cell plate which forms the

middle lamella of the daughter cell.

5) Celulose and pectin deposits along the cell plate to form cell wall of the daughter cell.

Cytokinesis in Animal Cell.

1) The cell membrane invagenates around the equatorial plate and the invagenation deepens towards the centre of the cell.

2) Ultimately the invaginations meet at the centre and the cytoplasm is cleaved into two equal halves by the the process called cleavage.

3) Each half of the cytoplasm sharing a nucleus in it forms a daughter cell.

Why is mitosis called equational division ?

1) The numerical quantity and genetic quality of chromosome remain unchanged in a pair of daughter cell as compare to that of parent cell.

2) The cytoplasm along with cell organell in the mother cell gets evenly distributed in the two daughter cell.