Table: Cell division

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| Mitosis/Mitotic division/Equational cell division | | |
| **Stages of mitosis** | | **Major sequence of events observed during mitosis**  (As observed via electron microscope) |
| **Interphase** | | Nuclear membrane and nucleolus are distinct  Network of chromatins appear within the nucleus  Cytoplasm is visible |
| **Karyokinesis** | **Prophase** | Nuclear membrane and nucleolus disappear  Chromatins condense to form chromosomes which appear to have two chromatids joined by centromeres.  Start forming spindle fibre |
| **Metaphase** | Metaphase chromosomes get attached to the spindle fibres by their kinetochores/centromeres  Metaphase plate is observed |
| **Anaphase** | Centromere divides and separate sister chromatids  Sister chromosomes moves to opposite poles of the cell |
| **Telophase** | Chromosomes uncoil and form network of chromatin  Nuclear membrane and nucleolus reappear  Two nuclei are seen within a cell |
| **Cytokinesis** | | In animal cell, furrow/constriction in plasma membrane deepens and joins in the center to divide cytoplasm into two, eventually forming two daughter cells.  In plant cell, cell wall formation begins with cell plate formation at the center of parent cell where Golgi bodies assemble, eventually forms two daughter cells |

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| **Meiosis/Meiotic division/Reductional division** | | | |
| **Stages of meiosis** | | **Major sequence of events observed during mitosis**  (As observed via electron microscope) | |
| Meiosis I | **Prophase I**  *(Further subdivided into five phases based on chromosomal behaviour)* | **Leptotene/Leptonema** | Compact chromosomes are visible.  Homologous chromosomes start pairing |
| **Zygotene/Zygonema** | Synapsis (*Process of association of chromosomes*) of chromosomes occur accompanied by formation of synaptonemal complex.  *Complex formed by a pair of synapsed homologous chromosomes is called bivalent or tetrad.* |
| **Pachytene/Pachynema** | Bivalent chromosomes appear as tetards.  Appear recombination nodules (sites at which crossing over occurs between non-sister chromatids of the homologous chromosomes)  Occurs crossing over  Crossing over/Recombination is the exchange of genetic materials between two homologous chromosomes. Crossing over is recombinase mediated process leading to recombination of genetic materials on the two chromosomes. |
| **Diplotene/Diplonema** | Dissolution of the synaptonemal complex  Appear chiasmata formed by homologous chromosomes  Recombined homologous chromosomes of the bivalents separated from each other except at the sites of crossing overs. These X-shaped structures are known as Chiasmata  In oocytes of some vertebrates, diplotene can last for months or years. |
| **Diakinesis** | | Termination of chiasmata  Chromosomes condense fully  Assemble meiotic spindle to prepared the homologous chromosomes for separation.  By the end of diakinesis, the nucleolus disappears and the nuclear envelope also breaks down.  Diakinesis represents transition to metaphase. |
| **Metaphase I** | | The bivalent chromosomes align on the equatorial plate  The microtubules from the opposite poles of the spindle attach to the pair of homologous chromosomes. |
| **Anaphase I** | | The homologous chromosomes separate and move to opposite poles of cell, while sister chromatids remain associated at their centromeres. |
| **Telophase I** | | Nuclear membrane and nucleolus appear |
| **Cytokinesis** | | Follows telophase I and this is called as dyad of cells |
| **Interkinesis** | | | Short lived stage between Meiosis I and Meiosis II |
| Meiosis II | **Prophase II** | | The nuclear membrane disappears by the end of prophase II  The chromosomes again become compact. |
| **Metaphase II** | | Chromosomes align at the equator by getting attached to the spindle fibre to the kinetochores of sister chromatids. |
| **Anaphase II** | | Division of the centromere of each chromosome  Separated chromosomes move towards opposite poles of cells |
| **Telophase II** | | Nuclear envelope encloses chromosomes and cytokinesis follows. |
| **Cytokinesis** | | Results in the formation of tetrad of cells i.e., four haploid daughter cells are formed. |