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16 December 2022
                                     11:09
  3.1
  1. Cell cycle definition? The complete sequence of events in the life of an individual diploid cell.
                              Cell cyle
              longest
                                                                  kanyokinesis
                                          Mitotic phase (M) 1
                     Interphase
                                         - Mitosis (nuclear division)
                  - G, Ist gap
                                                                                                                                                     uncoiled
                                                                                                                                                                        condensed
                   - S synthesis
                                        - Cytokinesis (division of
                                                                                                                                                                        chromatid
                                                                                                                                                    chomatin
                  - G2 2nd gap
 3. G, phase
                                                                                                 form spindle fibre
                                      S phase (synthesis) | G2 phase
                                                                                                                                                                                                 4 centromeres = 4 chromosomes
                                                                 - synthesis of microtubules
                                    -DNA replicates
    -longest
                                                                 - centrosomes & centrioles replicate
                                    - Importance?
    - cell growth
    - no. of organelles T
                                                                                                                                                                                             · 8 DNA molecules
                                          \begin{cases} 
                                                                                                                                                         sister
                                                                                                                                                       chromatid
               IMG_2022...
 4. Human somatic cells -> 46 chromosomes
      Human reproductive cells > 23 chromosomes
                         Cell Division
  5.
                                       Meiosis
            Mitosis
                                                                                                  (S-phase)
                                    -primordial germ cell
       - Somatic
      - produce 2 daughter - produce 4 daughter cells
      - no. of chromosomes in - no. of chromosomes in daughter cells
                                                                                                                                      Check for
         daughter cell =
                                       = 1 no. of chromosomes in parental cells
                                                                                                                                                    - Adequate cell size
        no. of chromosomes in
                                                                                                                                                > - Sufficient nutrient
         parental cell
                                                                                                                                                    - no DNA damage
   6. Cell cycle control at G, and M checkpoints.
          xgo-ahead signal, cell exits cell cycle, enters Go (non-dividing state)
          go-ahead signal, cell continues on in the cell cycle.
        In cancerous cells,
        - X normal signals
        - ignore signals that cause them to stop dividing.
        - cell divides continuously.
     3.2
1. Definition of mitosis?
        A division of somatic cell to produce 2 genetically identical and daughter cells with each cell having the same number of chomosomes as the parental cell
           chomosomes as the parental cell.
                                                                                                       Anaphase
     2. Prophase
                                                                                                      1. Two sister chromatids separate & move towards opposite poles.
        1. Centrosomes move to opposite poles of the cell.
                                                                                                      2. Each chromatid becomes an independent chromosomes.
        2. Nuclear envelope and nucleolus disappear.

3. Chromatin fibers coiled and condensed. 3 chromosomal
                                                                                                     Telophase
        4. Chromosomes shorten & thicken.
                                                                       J behaviour
                                                                                                     1. A new nuclear envelope forms around each group.
                                                                                                     2. Nucleoli reappear in Rach new nucleus.
                                                                                                     3. Chromosomes arrive at opposite poles.
          Metaphase
                                                                                                     4. Chromosomes uncoil & lengthen, become less condensed, return to chromatin form.
          1. Chromosomes line up at the metaphase plate.
         2. Chromosomes are attached to spindle fibres.
    3. Cytokinesis in Animal Cell
        - process : cleavage, apperance: cleavage furow.
        - membrane is pulled inwards by cytoskeleton.
        - contractile ring forms on cytoplasmic side of cleavage funow.
         - microfilaments of the ring contracts.
         - cleavage fumow deepens, reducing the diameter of contractile ring
           & pinches off.
        -The cells are separated completely & 2 daughter cells are formed.
     4. Cytokinesis in Plant Cell
        - vesicles derived from Golgi body move along microtubules to the middle of the cell.
        - vesicles enlarge & fuse to form a cell plate across the equatorial of the cell.
        - cell plate expands outward and fuse to plasma membranes.
        - A new cell wall forms between the membranes and forming 2 cells.
                                                    Similarities (mitosis)
                                                        Line chromosomes
                                                        at equator in
                                                            metaphase
           X centrioles
                                                                                                          √ centroles
                                                                                                          Vasters
          x aster
                                                                                                              formation.
                                                       Spindle
                                         Plant
                                                                             Anima
                                                       fibers pull
                                         Cell
                                                                             cell
                                                        chromoso mes
          formation of
                                                        apart in
                                                                                                        formation of
           cell plate
                                                                                                          cleavage
                                                                                                       occurs in
                                                        DNA
                                                                                                        Somatic cells
                                                       Condenses &
          occurs in
         menistem tissue
                                                       1 nuclei form.
        (shoot / root )
apex tip
     5. Importance of mitosis
         - Genetic stability
         - Growth
         - Regeneration
          - cell replacement
         - asexual reproduction
   1. Definition of meiosis
       The division of germ cell to produce four genetically non-identical haploid daughter cells
                                                        half the Ino. of Ichromosomes of the patental cell.
  2. parental cell=2n, daughter cell=n
  3. Bivalent > 2 chromosomes XX
  4. Tetrad > 4 chromatids 8888
                                                                                               meiosis IL
   5. Prophase I
                                                                                              same as mitosis.
       4 LZPDD
    () Leptotene
       - Chromosomus wisible.
    ② Zygotene
       - Synapsis occurs
      - homologous chromosomes come tot as pairs (bivalent/
   3 Pachytene
      - Chising over occurs
      - region = chiasma
      - non-sister chromatids exchange genetic material.
    & Diplotene
      - separation of homologous chromosomes
      - Still attach at chiasma
     6 Diakinesis
       - chromosomes become thicker
       - chiasma appear as open crosses.
      - dispersion of nucleoli & nuclear envelope.
      - spindle fibres form.
      Metaphase I
      - Homologous chromosomes arranged at the metaphase plate of the spindle.
       Anaphase I (centromere X split)
     - Homologous chromosomes scparate and move toward opposite poles.
    - spindle fibres shorten & pull homologous chromosomes.
       Telophase I
       - Chromosomes arrived at opposite poles.
      - Nuclear envelope reforms and nucleoli reappear.
6. Importance of meiosis
    - produce haploid gametes for sexual reproduction.
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Topic 3: Cell division

-genetic variation.

(crossing over / random amangement)

metaphase I