

## Biodiversity notes- Chapter 6

09/03/2014

### A. Paradigms in Biology

- All organisms are composed of cells
- There is a universal genetic code shared by all organisms and its code transmits information between generations

### B. Research Methods: Cell fractionation

- The disruption of a cell and separation of its parts by centrifugation (size and density) at successively higher speeds.

### C. DNA

- Deoxyribonucleic acid
- Chromosomes (DNA + proteins)
- Nucleosome
- Nucleic Acid
- Nucleotide

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### A. Functions of cell division

- Reproduction (single-celled organism)
- Growth and development (multi-cellular organisms)
- Renewal and repair

### B. Mitosis

- Division of the nucleus producing two daughter nuclei, each with a chromosome complement identical to that of the original nucleus
- 46 chromosomes (23 pairs)
- 92 chromatids (chromosome replicates)
- S (synthesis) Phase- DNA is replicated
- G2 (Growth)
- G1 (Growth)

### C. Phases-

- **Interphase-** Chromosomes begin to coil and start to become visible
  - o Centrosomes- In charge of the separation of cells
- **Prophase-** Chromosomes have condensed, become visible
- **Prometaphase-** Nuclear envelope and visible chromosomes begin to move
- **Metaphase-** Chromosomes condensed state in the middle of the cell
  - o Centrosomes attached to the spindle
- **Anaphase-** Group of chromosomes that are identical
- **Telophase and Cytokinesis-** The rest of the division of the cell, nuclear envelope redevelops

### D. Cells

- **Diploid-** 2N (N being number of chromosomes in one pair) -> Somatic cells

- **Haploid**- Half the genetic material (23) -> Gametes (sperm cells, eggs)
- E. Example question: A cell containing 92 chromatids at the start of mitosis would, at its completion, produce cells containing how many chromosomes?
  - a. A. 12
  - b. B. 23
  - c. C. 92
  - d. D. 16
  - e. E. 46
- Answer is E
- F. Binary Fission- Bacterial cell division

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- A. Human Karyotype- a display of condensed chromosomes displayed in pairs (homologous chromosomes)
- B. Genetics: The study of heredity and dereditary variation
- C. Genome: The complete complement of an organisms genes
- D. Meiosis reduces the number of chromosome sets from diploid to haploid
  - Like mitosis, meiosis is preceded by the replication of chromosomes
  - Meiosis takes place in two sets of cell divisions, called meiosis I and meiosis II
  - The two cell divisions result in four daughter cells, rather than the two daughter cells in mitosis