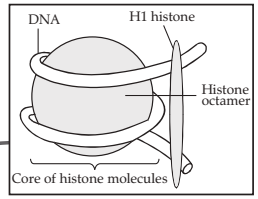
MIND MAP : LEARNING MADE SIMPLE

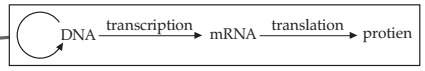
CHAPTER - 6

Molecular Basis of Inheritance

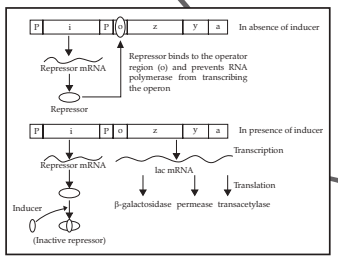
- Human Genome Project
  - To identify all the estimated genes in human DNA
  - To determine the sequences of the 3 billion base pairs
  - To provide tools for data analysis
- Polynucleotide Chain
  - Made of Nucleotide
    - Phosphate group
    - Sugar
      - Ribose in RNA
      - Deoxyribose in DNA
    - Nitrogenous Base
      - C, T (only in DNA), U (Only in RNA)
      - A, G
- DNA packaging Nucleosome



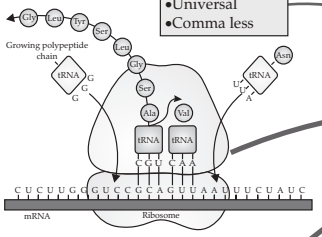
- Central dogma



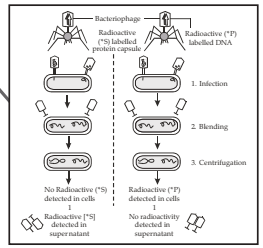
- Gene expression and regulation
  - Lac operon
    - The operon controlling lactose metabolism
      - Structural gene
      - Operator gene
      - Promoter gene
      - Repressor
      - Inducer



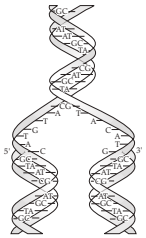
  - Genetic Code
    - Definition
      - Sequence of nucleotides (nitrogen bases) in mRNA that contains information for protein synthesis (translation).
    - Features
      - Triplet
      - Non-ambiguous
      - Degenerate
      - Comma less
      - Universal
      - Comma less
    - Translation



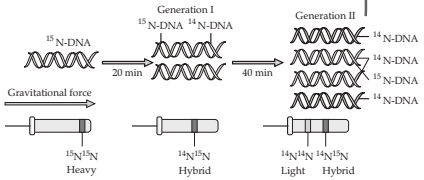
- Search for genetic material
  - Griffith exp
    - S-strain → Inject into mice → Mice die
    - R-strain → Inject into mice → Mice live
    - S-strain (Heat killed) → Inject into mice → Mice live
    - S-strain (Heat killed) + R-strain (live) → Inject into mice → Mice die
    - Conclusion: Some 'transforming principle', transferred from heat-killed S-strain to R-strain.
  - Hershey and Chase exp.



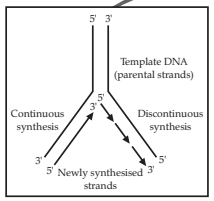
    - Discovered by Oswald Avery, Colin MacLeod and Maclyn McCarty.
    - Conclusion: DNA is the hereditary material.
  - Biochemical Nature



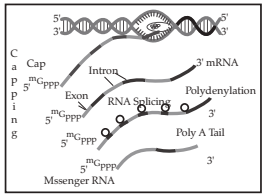
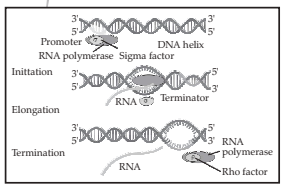
  - Semi-Conservative DNA Replication
    - Meselson and stahl experiment



    - Replication
      - Process



  - Transcription
    - In Eukaryotes
      - Capping



    - In Prokaryotes