CHAPTER :- "INHERITANCE" ①

Notes — **SOCH BADLO BY MAK**

- **Heredity** → transmission of characteristics from parents to offsprings.
- **Inheritance** → study of heredity.
- **Gene** → basic unit of heredity.
- **Genetics** → study of genes.

GENERAL TERMS RELATED TO INHERITANCE

* **Gene:** Segment of DNA in which info is stored.
* **Alleles:** The partners of gene pair.
* **Locus:** Specific position of gene on chromosome.
* **Genotype:** Genetic makeup of an organism.
* **Phenotype:** Physical appearance of trait in an individual.
* **Homozygous:** alleles having similar genotype.

gene always occur in pair.

- homozygous dominant — AA
- homozygous recessive — aa.

* **Heterozygous:** alleles having different genotype.
e.g Aa.

"ROLE OF GENE IN PROTEIN SYNTHESIS"

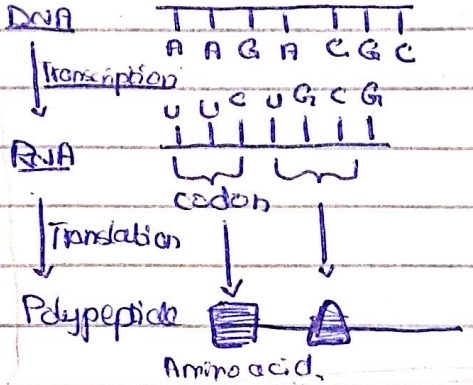
- DNA contain information for protein synthesis.
- It occurs in 2 steps:
  (i) Transcription → in nucleus
  (ii) Translation → cytoplasm.

GENERAL SKETCH:

DNA → mRNA → tRNA → rRNA → codon

∴ 3 nucleotide = 1 codon

(amino acid) protein



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"PATTERNS OF INHERITANCE"

* Gregor Johann Mendal {Austrian Monk} → extensive study on pea plant.

Scientific name: Pisum sativum

*** Why Mendal selected Pea Plant for his experiment ?**

(i) Pea plant is easy to cultivate.
(ii) Short & fast cycle.
(iii) It has many contrasting traits.
(iv) Self & cross both type of fertilization.

How many characters did Mendal study during his experiment? 7 (seven)

"LAW OF SAGREGATION"

- true breeding plant (homozygous conditions)
- hybrid → variety produced by crossing two true breeding plant.
- monohybrid → hybrid in only one trait.
- **Example: Tall & Short Plant.**

P: TT (T) × tt (t)

Gametes

F1: Tt

♀ / ♂	T	t
T	TT	Tt
t	Tt	tt

Phenotype ratio: 3:1

Genotype ratio: 1:2:1

CONCLUSION / RESULTS:

(i) True breeding possess two factors for given allele.
(ii) F_1 gen is a combination of both genes (heterozygous)
(iii) Only dominant allele show it's effect in F_1
(iv) Recessive factors reappear in F_2 gen.

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"LAW OF INDEPENDENT ASSORTMENT"

(i) After sucess in law of sagregation, Mendal' studied two traits at a time.
(ii) F_1 gen are dominant heterozgous
(iii) F_2 gen is mix.

Example:-

Seed color:- YY yy Seed shape: RR rr

RRYY × rryy

RY ry

RrYy

RY Ry rY ry

RY	RY	Ry	rY	ry
RY	RRYY	RRYy	RrYY	RrYy
Ry	RRYy	RRyy	RrYy	Rryy
rY	RrYY	RrYy	rrYY	rrYy
ry	RrYy	Rryy	rrYy	rryy

Result:

9 : 3 : 3 : 1

"Heterozygous Interaction"

- **Co-dominance:**
  * both alleles are expressed equally & fully

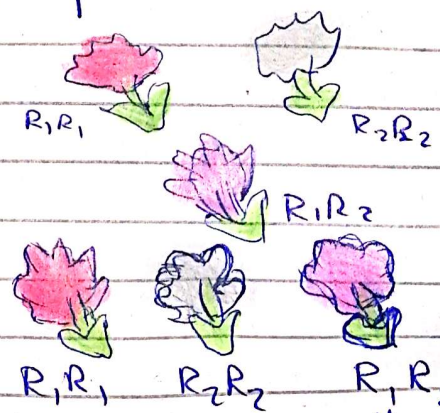
example:-

"AB blood group"

- **Incomplete dominance:**
  * Phenotype is a blend of intermediate of two alleles.

example:

4'o clock plant.



Result:- 1 : 2 : 1

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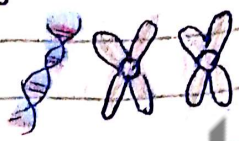
Variation :-
- continous
- discontinous

* difference in characteristics shown by indivisuals belonging to same specie.



• SOURCES OF VARIATION:
(i) Crossing over (ii) Independent assortment
(iii) Mutation (iv) Ferbilization.
(v) Gene flow.

EVOLUTION
* change in characteristic of population over a period of time.

• Natural Selection:-
(i) Over production
(ii) Variation
(iii) Competition
(iv) Survival of the fittest.

School of Thought

Evolutionist	Theory of Special Creation
↓	↓
Unicellular	God made everything
↓	
diversity evolved.	

ARTIFICIAL SELECTION:
* Selecting genetically improved & domesticated plants & animals.

- Selection
- Hybridization

• Selection:-
* seed of plant with most desirable traits are chosen & grown for centuries.

• Hyberdization:-
* crossing b/w different variates to produce a new variety.

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