

HEREDITY AND EVOLUTION

Mendel's laws of Inheritance

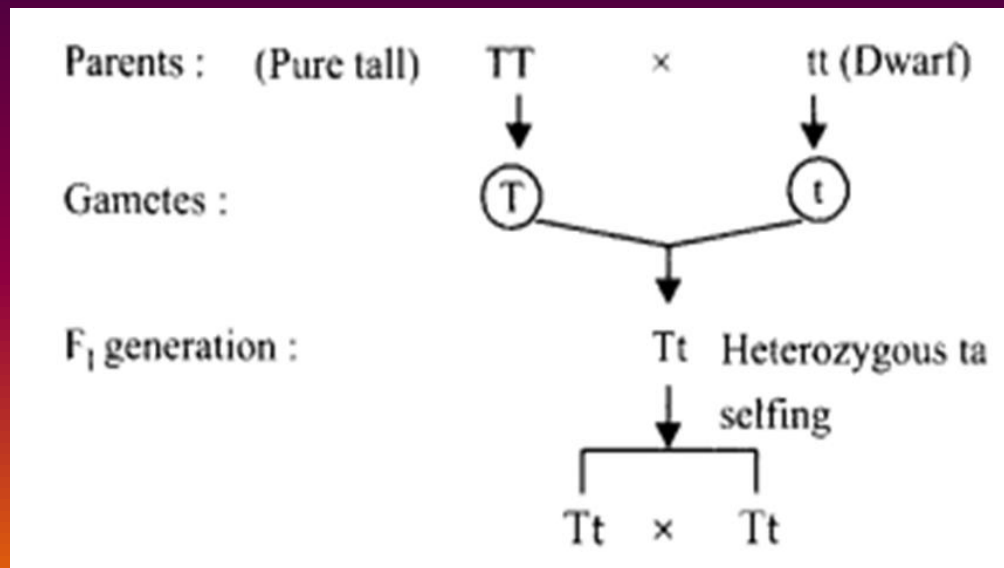
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Mendel's laws

- ▣ The two experiments (Monohybrid and dihybrid Cross) led to the formulation of Mendel's laws known as laws of inheritance, which are:
 - ▣ **Law of Dominance**
 - ▣ **Law of Segregation**
 - ▣ **Law of Independent Assortment**

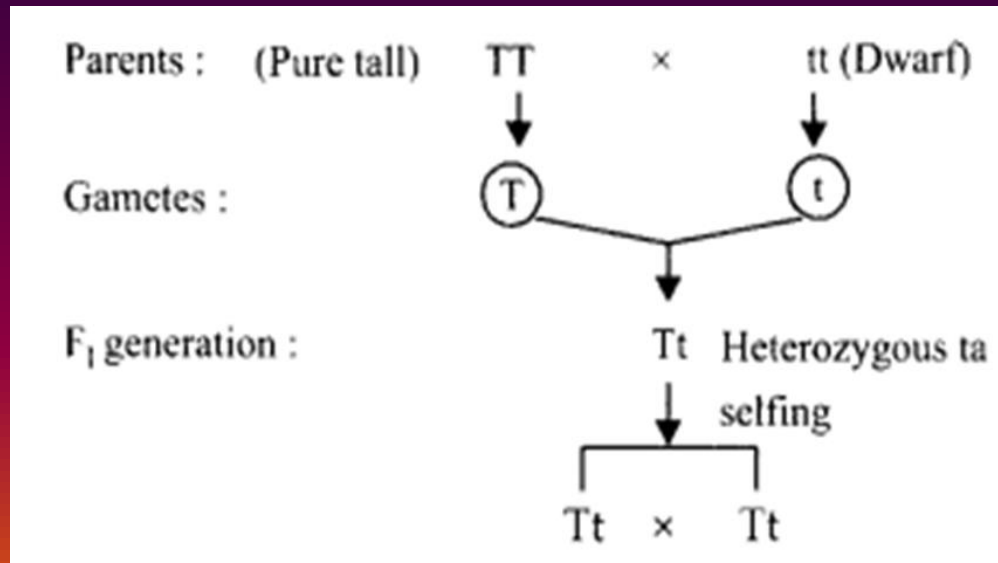
Law of Dominance (1st Law)

- ▣ This is also called Mendel's first law of inheritance. According to the law of dominance, **Dominant alleles** are expressed exclusively in a heterozygote. The alleles that are suppressed are called as the **recessive traits** while the alleles that determine the phenotype are known as the dominant traits.



Law of Independent Assortment (2nd Law)

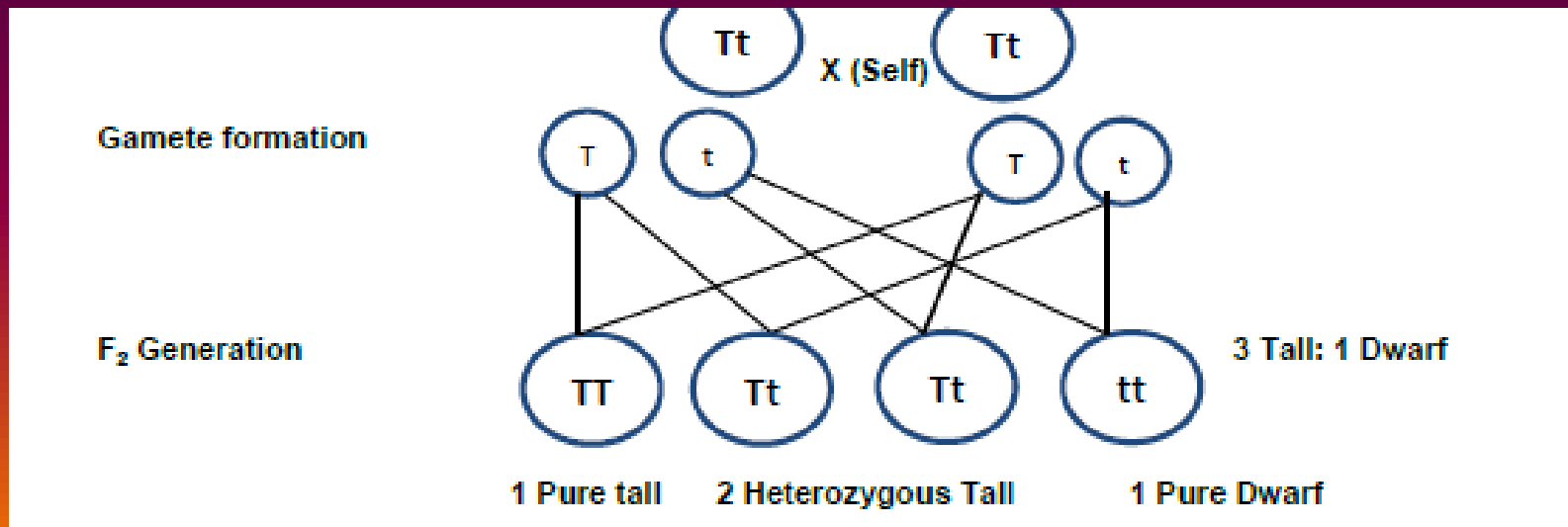
- Mendel's law of independent assortment states that the alleles of two (or more) different genes get sorted into gametes independently of one another. In other words, the allele a gamete receives for one gene does not influence the allele received for another gene.



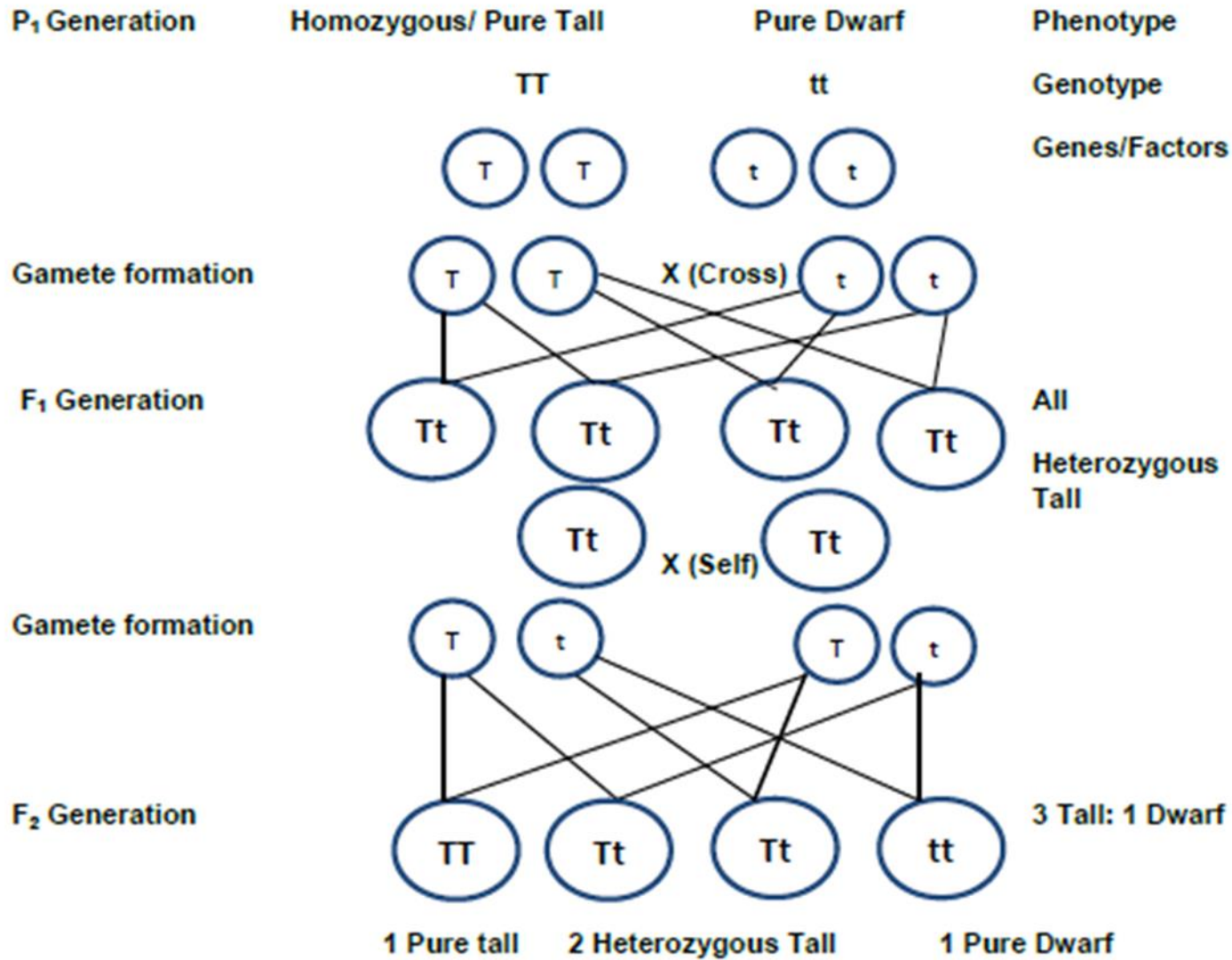
Exception: Due to linkage parental chromosomes will have a tendency to be inherited together, thus the genes will not reasonably assort independent of each other.

Law of Segregation (3rd Law)

- ▣ The law of segregation states that during the **production of gametes**, two copies of **each hereditary factor segregate** so that offspring acquire one factor from each parent. In other words, allele (alternative form of the gene) pairs segregate during the formation of gamete and re-unite randomly during fertilization.



Mendel's Monohybrid Test



Monohybrid Ratio or Phenotypic ratio: 3:1

Genotypic ratio: 1:2:1

Law of Segregation

- ▣ **Which is the universally accepted law of inheritance?**
- ▣ Law of segregation is the universally accepted law of inheritance. It is the only law without any exceptions. It states that each trait consists of two alleles which segregate during the formation of gametes and one allele from each parent combines during fertilization.
- ▣ **Why is the law of segregation known as the law of purity of gametes?**
- ▣ The law of segregation is known as the law of purity of gametes because a gamete carries only a recessive or a dominant allele but not both the alleles.

A person with a backpack stands on a rocky shore, looking out at the ocean during a sunset. The sky is filled with colorful clouds in shades of purple, pink, and orange. The person's reflection is visible in the water in the foreground.

**THANK YOU AND
STAY SAFE**