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Principle of segregation (law of purity of gametes)

Gregor Mendel's law stating that the *unit factors* are brought together and paired during union or fertilization; however, these unit factors do not affect or mix with each other though they have become paired.

Supplement

Breeding and testing about 5,000 pea plants, he was able to come up with crucial generalizations that were later on used as founding principles of the Mendelian inheritance or Mendel's Principles of Heredity. The so called "Mendel's laws of inheritance" came about based on the set of principles of Gregor Mendel. These laws are the *Law of Segregation*, the *Law of Independent Assortment*, the *Law of Dominance*, and the *Law of Unit Characters*. *Unit factors* from maternal and paternal gametes combine together and pair during the union of gametes (fertilization). However, the bringing together and pairing of these unit factors do not eventuate to their blending, altering, or mixing. They remain *pure* in a way that they remain as distinct entities within the somatic cells of the offspring. When the offspring does form its own gametes, the members of the paired unit factors would separate or segregate. Hence, this law is also referred to as Law of Segregation. Mendel further assumes that each of them assort independently into the newly formed gametes.
Synonym:

- Law of Segregation

Mendel's principle of segregation is inherent in the results of Mendel earlier described in this section. It is obvious that though in F_1 the dominant phenotype appears, the recessive phenotype is not lost but reappears in F_2 . This suggested that there is no blending of Mendelian factors in F_1 , but that they stay together and only one is expressed. At the time of the formation of gametes, these two factors obviously separate or segregate, otherwise recessive type will not appear in F_2 . The gametes which are formed are always pure for a particular character. A gamete may carry either the dominant or the recessive factor but not both as we find in F_1 individuals. This is why it is called either as '**principle of segregation**' or as '**law of purity of gametes**'. This concept of segregation is often called Mendel's first principle. While a 3 : 1 ratio in F_2 generation of a monohybrid cross suggested that segregation of alleles does take place, the testcross outlined above confirmed it.

Phenotype of parents \longrightarrow Pure Tall \times Pure Dwarf

Genotype \longrightarrow

TT tt

Gametes \longrightarrow



F_1 generation \longrightarrow

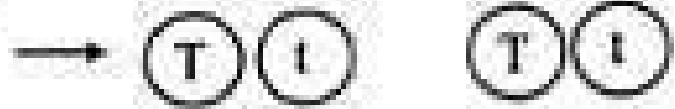
Tt

(Hybrid Tall)

Selfing of F_1 generation \longrightarrow

$Tt \times Tt$

Gametes formed in F_2 generation \longrightarrow



Mendel's Law of segregation also called Law of **purity of gametes** states that During formation of **gametes**, the alleles separate/segregate from each other and only one allele enters a **gametes**. The separation of one allele **does** not affect other.

The **law of segregation** states that, 'the alleles of a given locus **segregate** into separate gametes.' Alleles sort independently because the gene is located on a specific chromosome.

