

HEREDITY AND EVOLUTION

- **Heredity** – Transfer of characters from one generation to another.
- **Variations** – Some changes due to environment or habitat changes.

Gregor Johann Mendel (father of genetics) conducted the following crosses :

Monohybrid cross: Cross-between 2 pea plants with one pair of contrasting characters Tall/short.

Parents

Tall plant TT X Short plant tt
↓

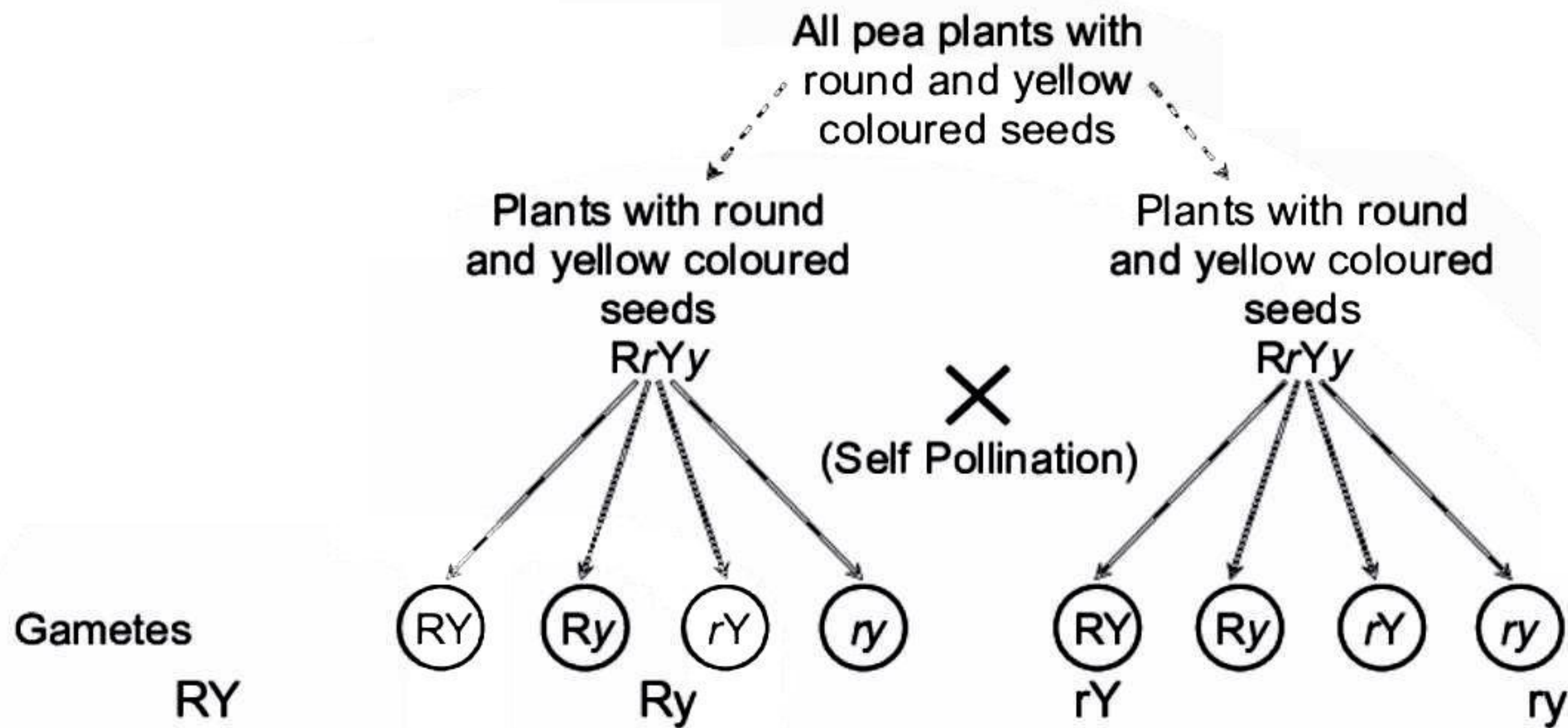
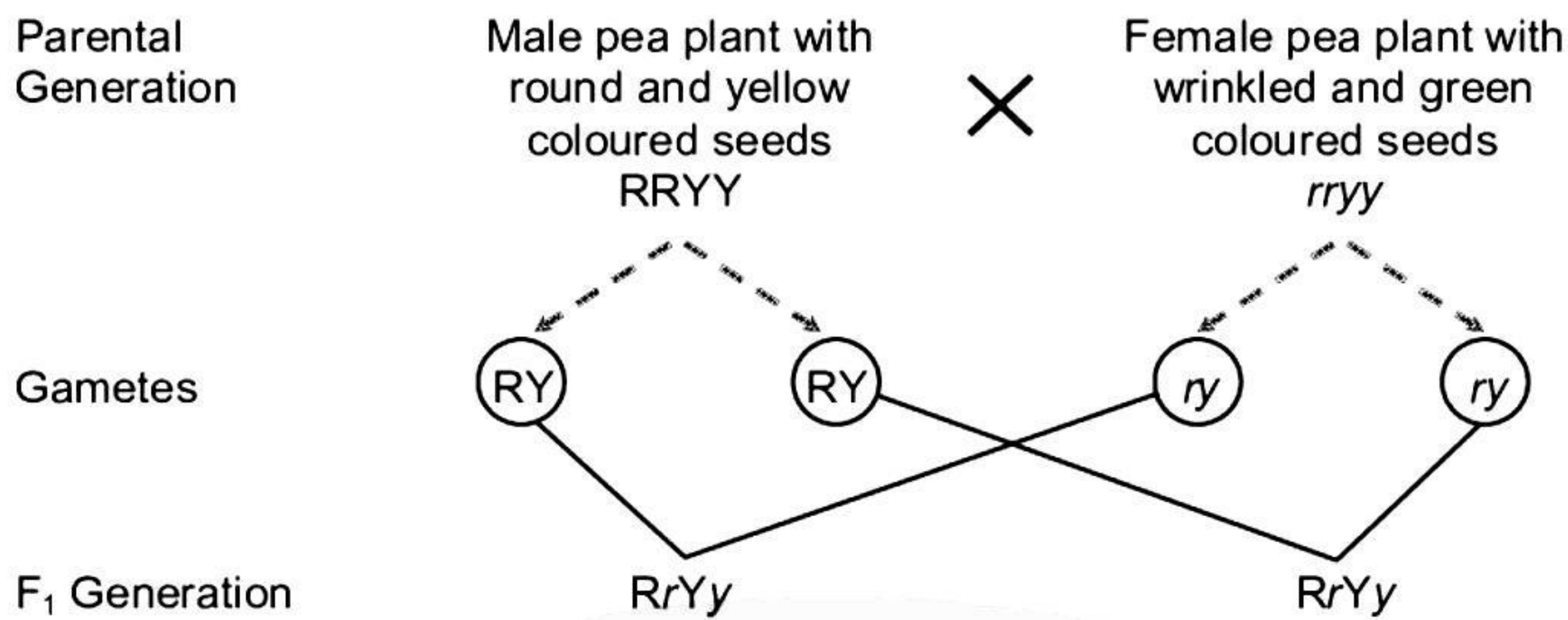
F₁ generation

All Tall plants
 Tt
Self pollination
X

F₂ generation

Tt F_1 Tt F_1
↙ ↓ ↘
 TT Tt Tt tt
Tall Tall Tall Short

Dihybrid cross: A breeding experiment dealing with two characters at the same time.



RY	$RRYY$ Round, yellow	$RRYy$ Round, yellow	$RrYY$ Round, yellow	$RrYy$ Round, yellow
Ry	$RRYy$ Round, yellow	$RRyy$ Round, green	$RrYy$ Round, yellow	$Rryy$ Round, green
rY	$RrYY$ Round, yellow	$RrYy$ Round, yellow	$rrYY$ Wrinkled, yellow	$rrYy$ Wrinkled, yellow
ry	$RrYy$ Round, yellow	$Rryy$ Round, green	$rrYy$ Wrinkled, yellow	$rryy$ Wrinkled, green

F₂ Generation

Plants with round and yellow coloured seeds : 9

Plants with round and green coloured seeds : 3

Plants with wrinkled and yellow coloured seeds : 3

Plants with wrinkled and green coloured seeds : 1

Mendel's Interpretation

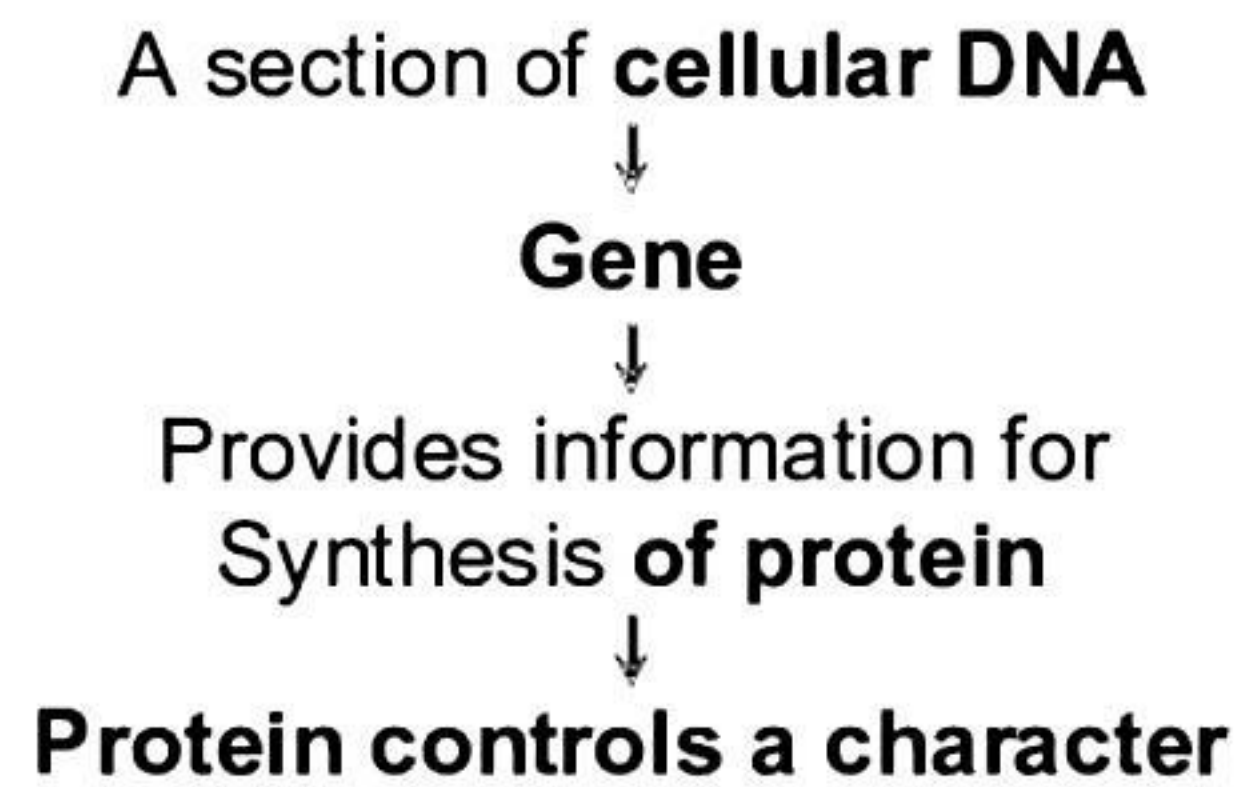
On the basis of monohybrid and dihybrid crosses, Mendel postulated :

Law of segregation	Law of dominance	Law of independent assortment
Genes (factors) segregate during gamete formation.	Appearance of only one of the two contrasting traits in F ₁ generation.	Inheritance of factors controlling a particular trait in an organism is independent of other.

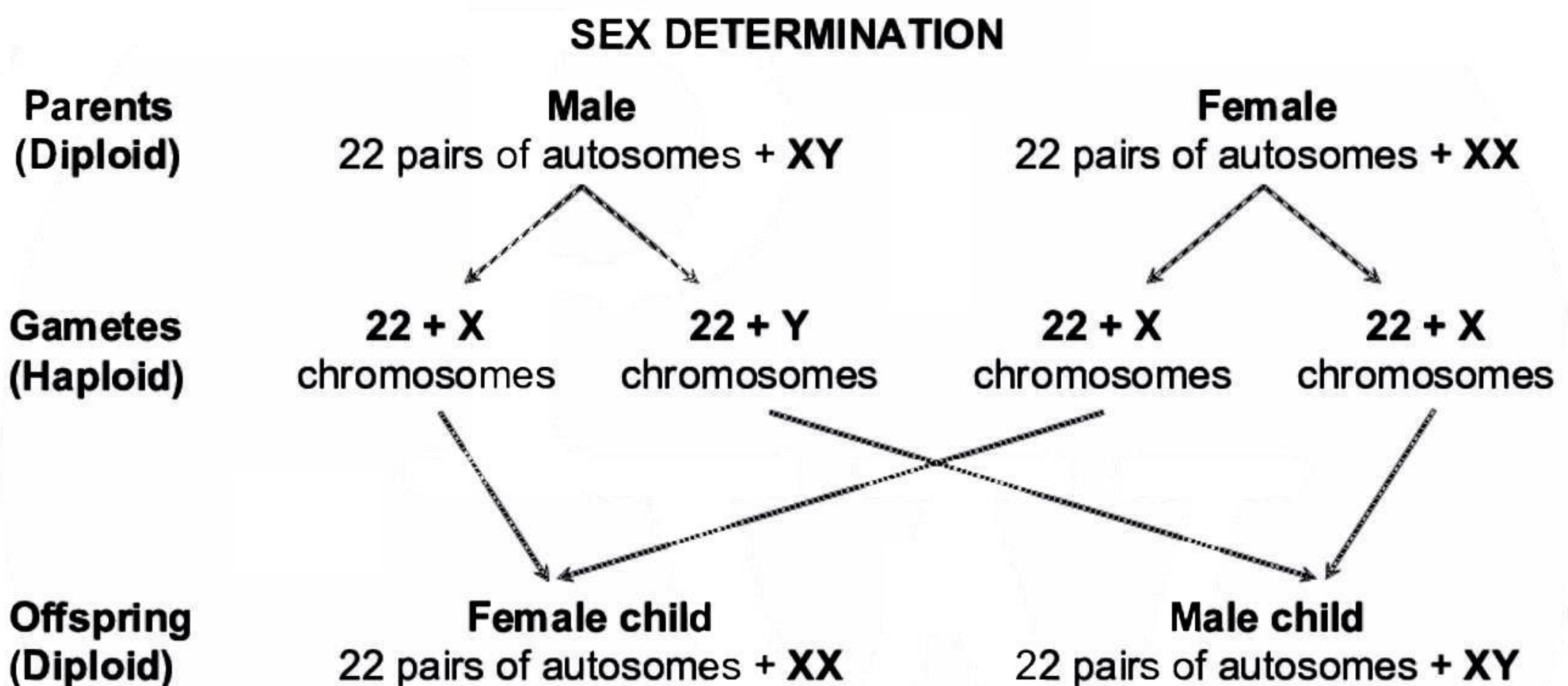
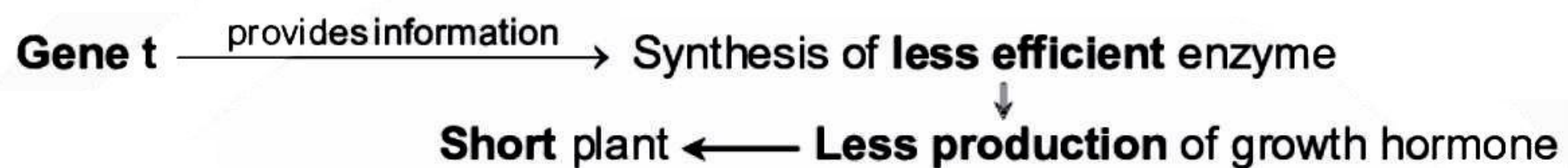
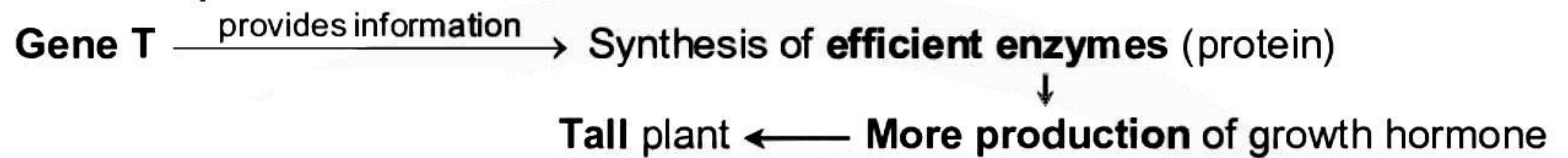
MECHANISM OF HEREDITY

Genes control characters or traits of an organism. Let's understand the mechanism of

heredity:



For example:



Evolution: Formation of new species from pre-existed organisms which might be quite different in their physiology, nutrition, habitat etc.