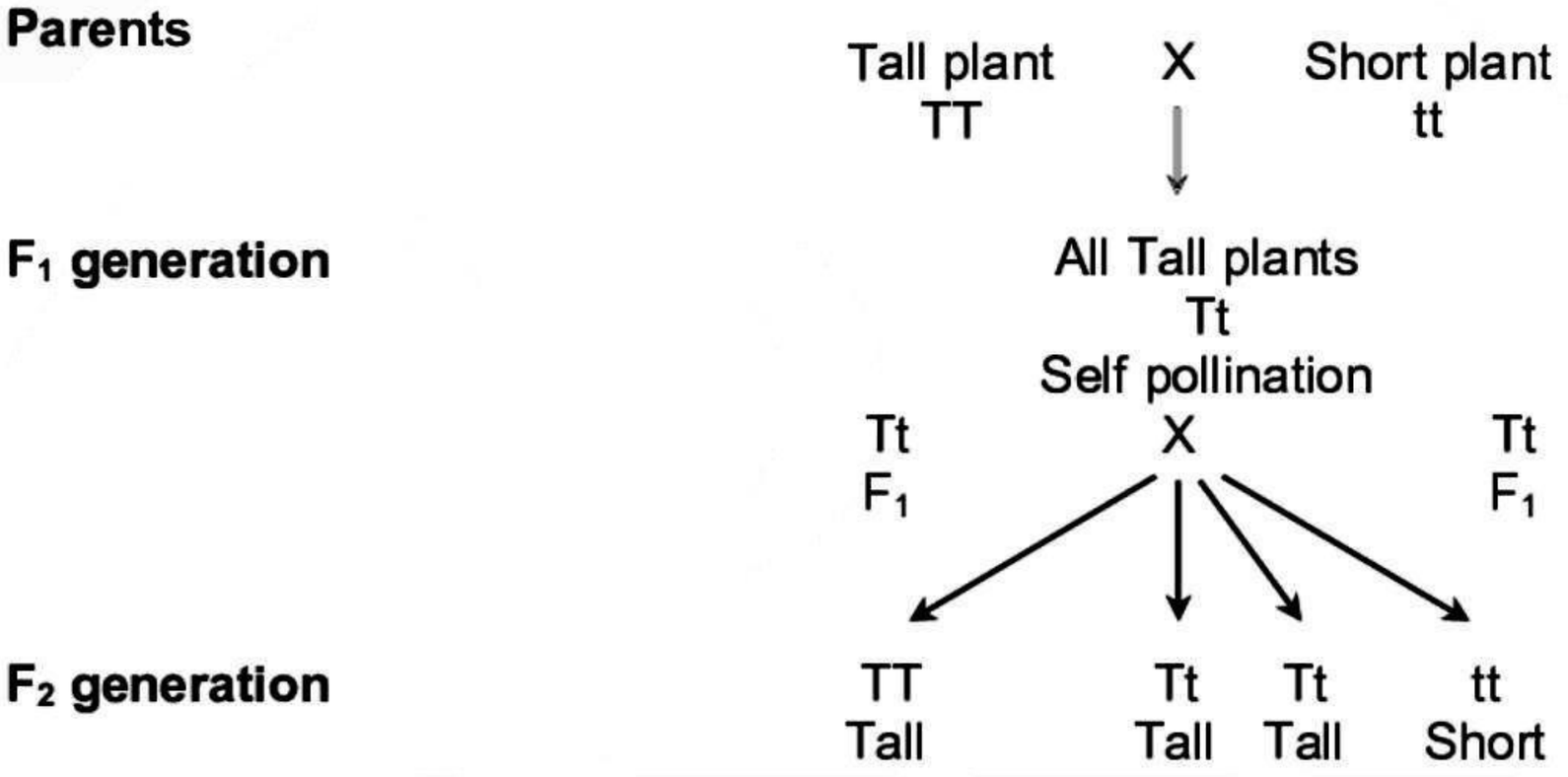
HEREDITY AND EVOLUTION

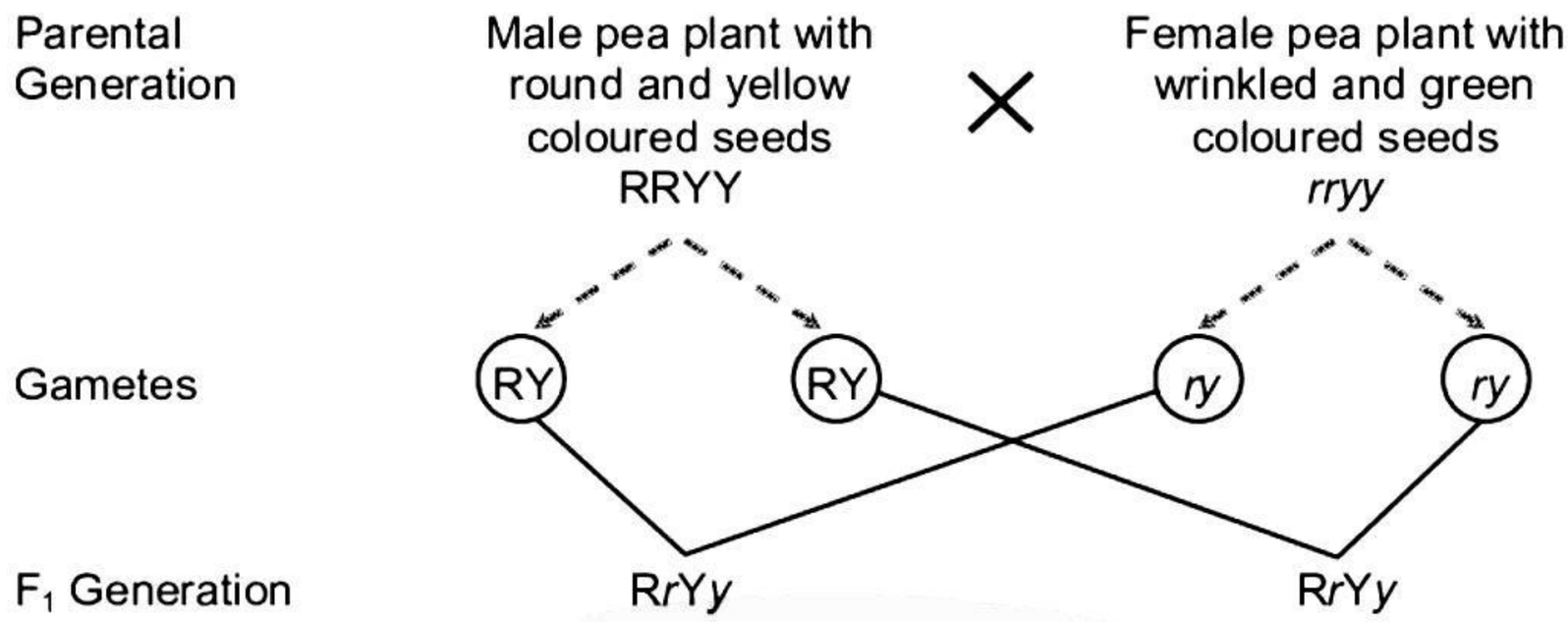
- **Heredity** – Transfer of characters from one generation to another.
- **Variations** – Some changes due to environment or habitat changes.

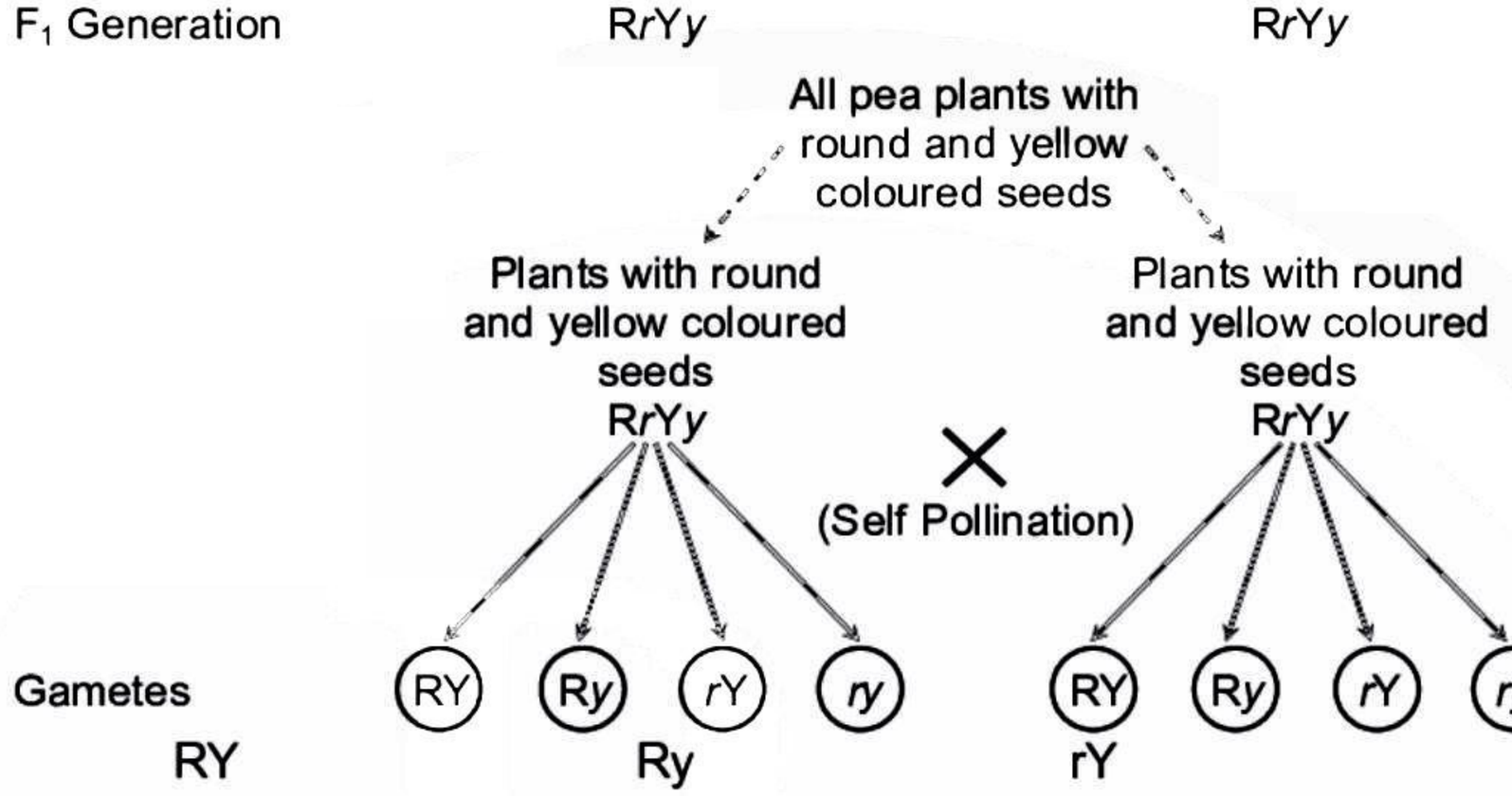
Gregor Johann Mendel (father of genetics) conducted the following crosses :

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



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





	RY	Ry	rY	ry
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

F_2 Generation

Plants with round and yellow coloured seeds	:	Plants with round and green coloured seeds	:	Plants with wrinkled and yellow coloured seeds	:	Plants with wrinkled and green coloured seeds
9	:	3	:	3	:	1

Mendel's Interpretation

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

- **Low of segregation** → Genes (factors) segregate during gamete formation.
- **Law of dominance** → Appearance of only one of the two contrasting traits in F_1 generation.
- **Low of independent assortment** → 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:

A section of **cellular DNA**

↓

Gene

↓

Provides information for
Synthesis **of protein**

↓

Protein controls a character

For example:

Gene T —provides information→ Synthesis of **efficient enzymes** (protein)

↓

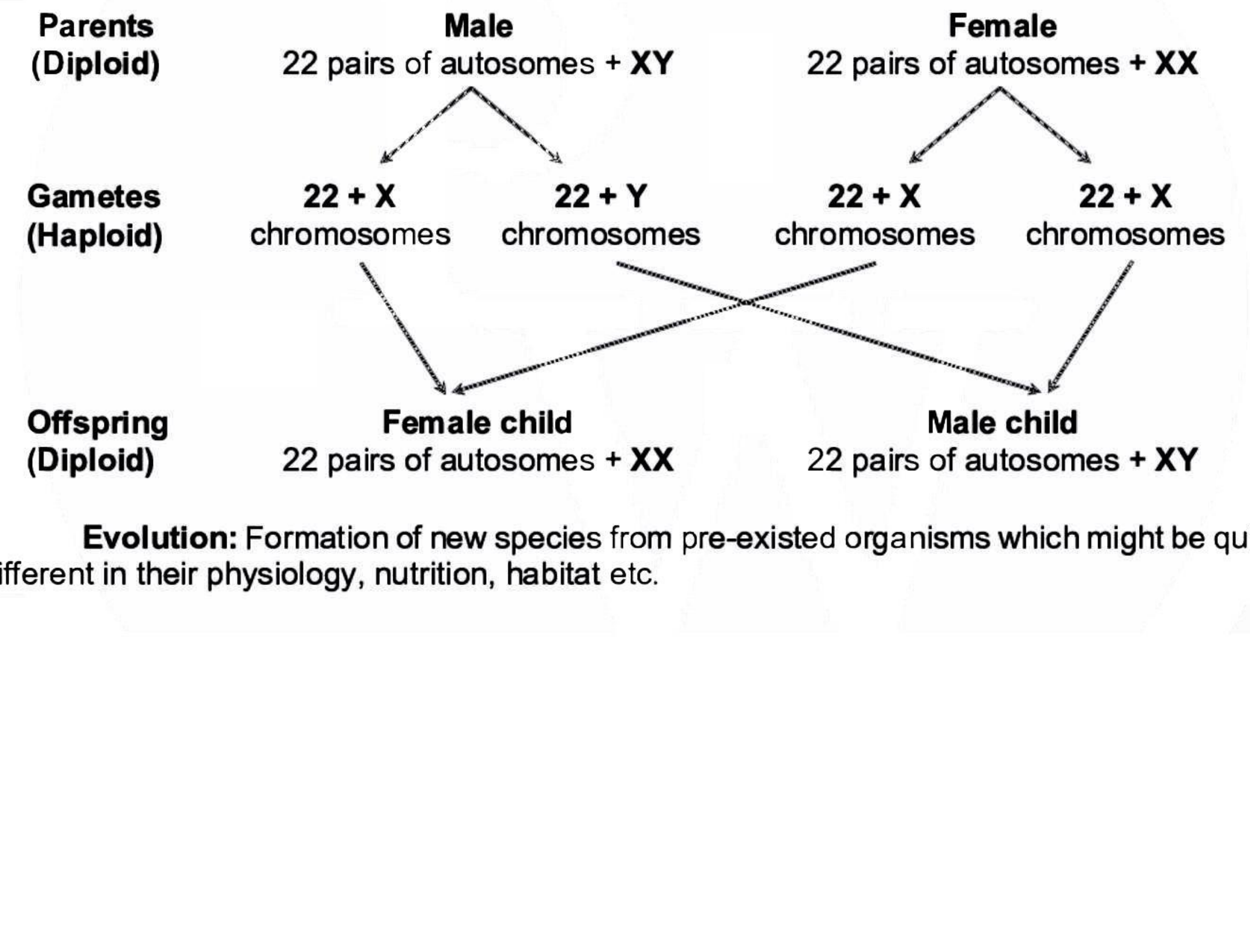
Tall plant ← **More production** of growth hormone

Gene t —provides information→ Synthesis of **less efficient** enzyme

↓

Short plant ← **Less production** of growth hormone

SEX DETERMINATION



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