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# Epistasis

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# Epistatic and Hypostatic

- The alleles that are masking the effect are called **epistatic alleles**
- The alleles whose effect is being masked are called the **hypostatic alleles**

# Types of Epistasis

**Epistasis** can be described as either

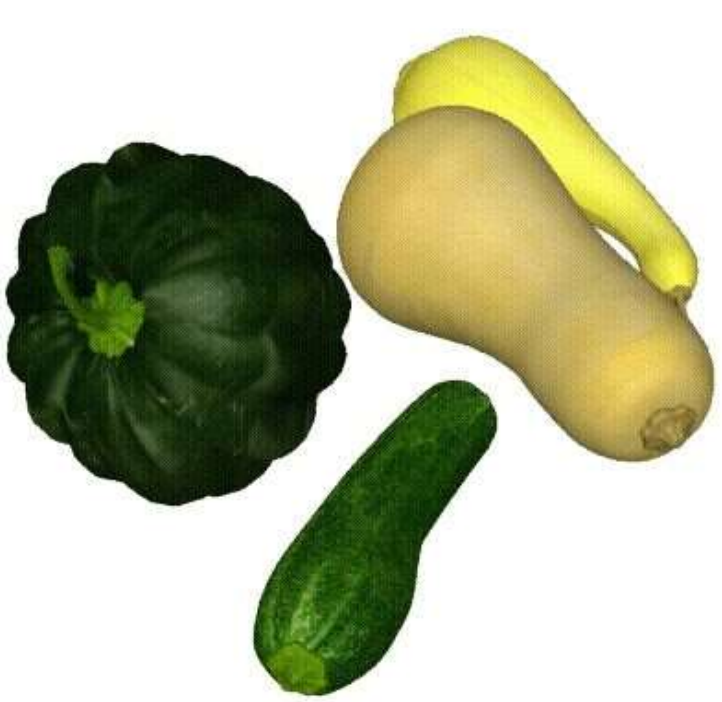
- **Recessive Epistasis** or
- **Dominant Epistasis**

# Dominant Epistasis

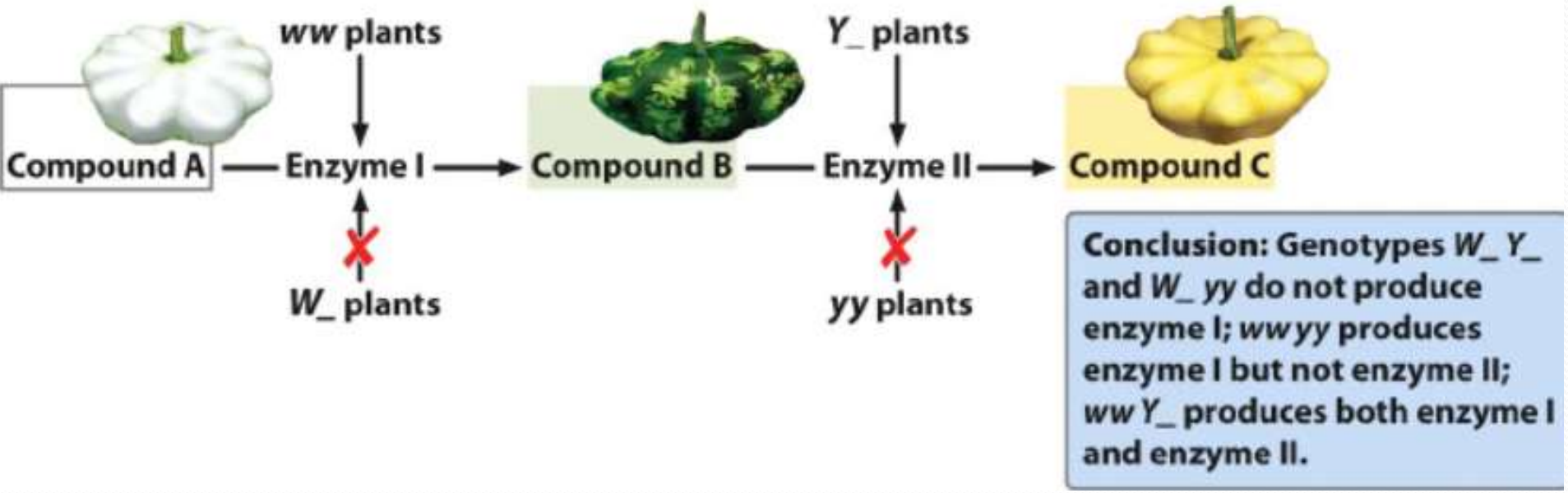
- When a **dominant allele** at one locus can **mask** the **expression of** both alleles (dominant and recessive) **at another locus**, it is known as **Dominant Epistasis**.
- Expression of one dominant or recessive allele is masked by another dominant gene.
- This is also referred to as **Simple Epistasis**.

# Fruit colour of Summer Squash

- Fruit colour governed by two genes:
  - Gene 1: **W- White** colour
  - Gene 2: **Y – Yellow** colour
- **Dominant W is Epistatic to Y**
- In absence of W and Y- **Green colour**



This figure shows how color is inherited in summer squash:



# Try this cross

WWyy x wwYY

White Yellow

W_Y_: 9
W_yy: 3
wwY_: 3
wwyy: 1

12

Gametes: WY × wy

$F_1$ Generation: WwYy Hybrid White

Gametes → WY, Wy, wY, wy

$F_2$ Generation

| | WY | Wy | wY | wy |
|---|---|---|---|---|
| WY | WWYY White | WWYy White | WwYY White | WwYy White |
| Wy | WWYy White | WWyy White | WwYy White | Wwyy White |
| wY | WwYY White | WwYy White | wwYY Yellow | wwYy Yellow |
| wy | WwYy White | Wwyy White | wwYy Yellow | wwyy Green |

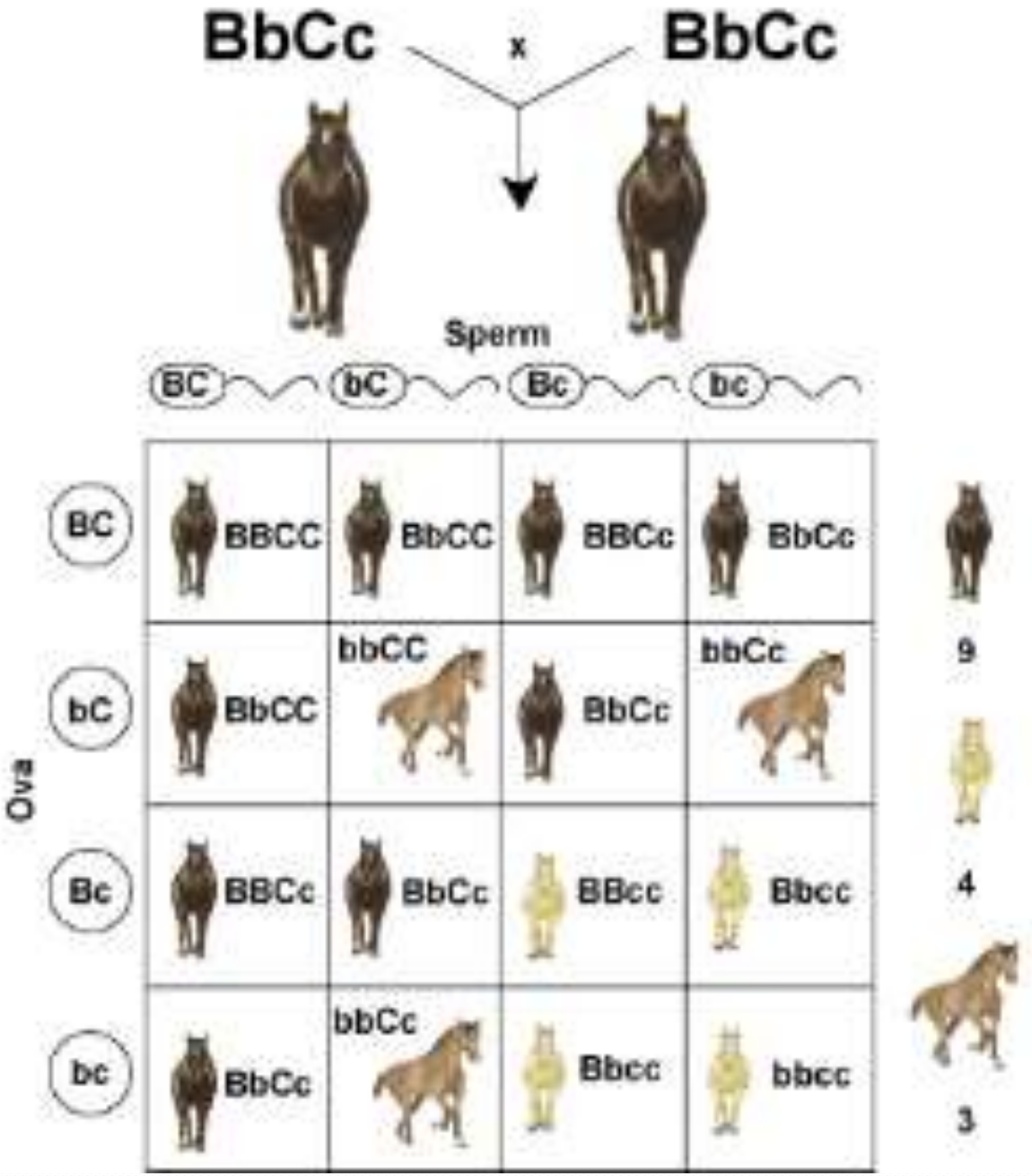
# Try this cross….

- Cross a Yellow squash (wwYy) with a white squash (Wwyy).

- What color are the offspring?

# Type of gene interaction?

- In **horses**, brown coat color (*B*) is dominant over tan (*b*). Gene expression is dependent on a second gene that controls the deposition of pigment in hair. The dominant gene (*C*) codes for the presence of pigment in hair, whereas the recessive gene (*c*) codes for the absence of pigment.
- If a horse is homozygous recessive for the second gene (*cc*), it will have a white coat regardless of the genetically programmed coat color (B gene) because pigment is not deposited in the hair.


BbCc
x
BbCc
Sperm
BC
bC
Bc
bc
Ova
BC
BBCC
BbCC
BBCc
BbCc
bC
BbCC
bbCC
BbCc
bbCc
Bc
BBCc
BbCc
BBcc
Bbcc
bc
BbCc
bbCc
Bbcc
bbcc
9
4
3