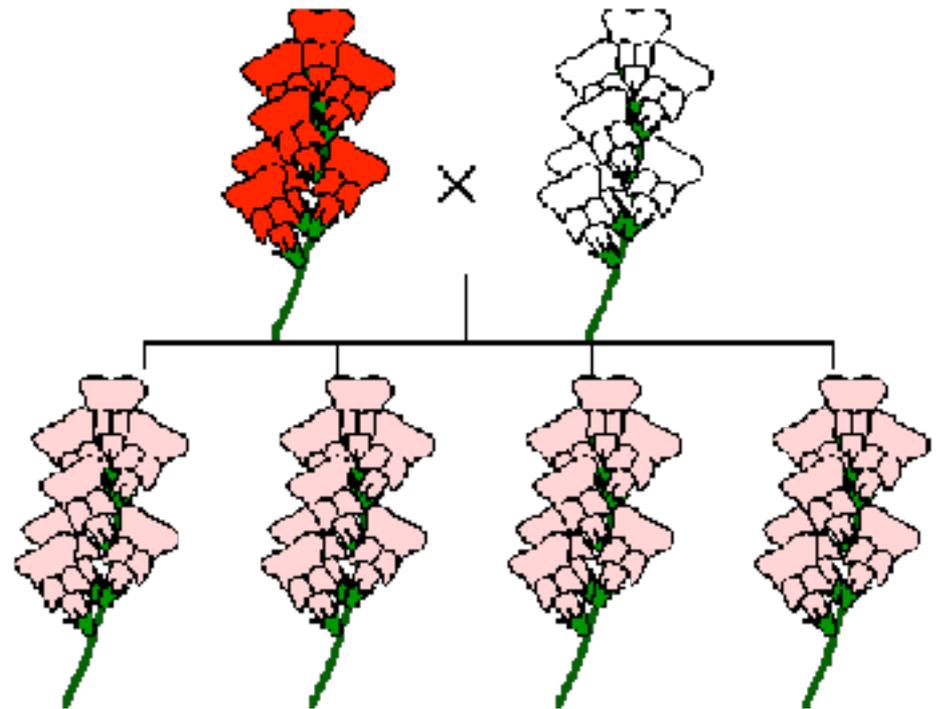




Non-Mendelian Genetics

Incomplete Dominance

- A situation in which one allele is not completely dominant over another:
- Neither allele is dominant in this case



Snapdragon flowers exhibit the characteristic of incomplete dominance.

Incomplete Dominance

- An example using flowers.

		RR	
		R	R
WW	W	RW	RW
	W	RW	RW



Codominance

- Codominance is situation in which both alleles contribute to the phenotype of the organism.
- Both alleles produce proteins that affect the trait.



Codominance

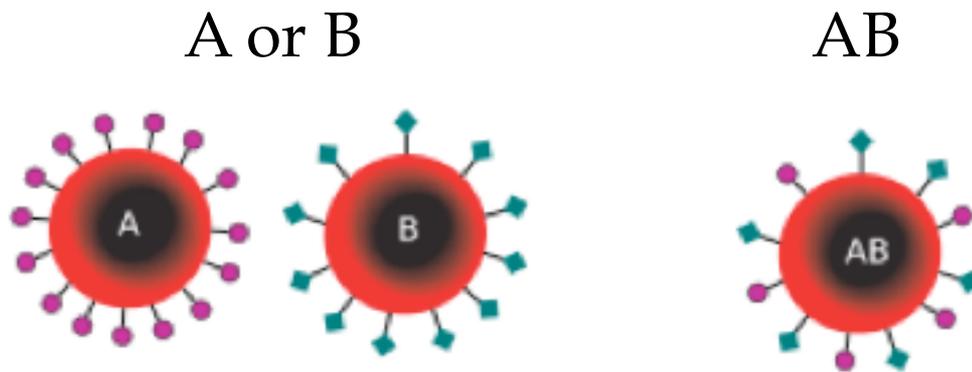
- An example using flowers.

		RR	
		R	R
WW	W	RW	RW
	W	RW	RW



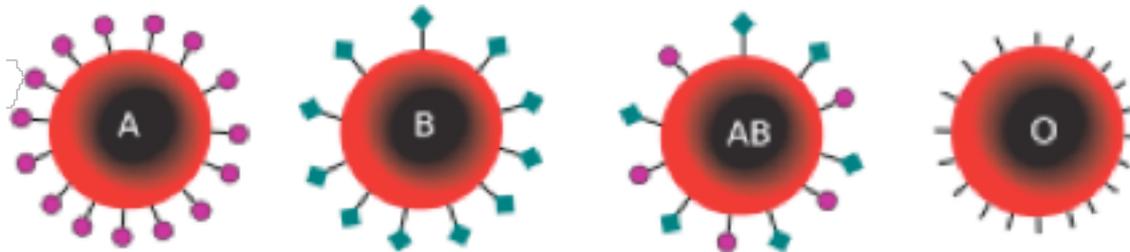
AB Blood Type

- In humans the traits for the A and B antigens found on red blood cells are codominant.



Multiple Alleles

- A situation in when there are more than two possible alleles for the same trait.
- Human blood type has multiple alleles.
 - ABO
 - Codominant - A and B
 - Recessive - O



ABO Blood Type

- Possible blood types are A, B, AB, and O.
- A woman with type O blood and a man with type AB could possibly have children with which blood types?

	O	O
A	AO	AO
B	BO	BO

ABO Blood Type

- A woman with type B blood and a man with type A could possibly have children with which blood types?

Rh Factor

- Rh is determined by a separate gene.
- Rh⁺ is dominant over Rh⁻.
- What is the possible outcome of a child if one parent is Rh⁺ and the other parent is Rh⁻.

Multiple Alleles



Full color: CC , CC^{ch} , CC^h , or Cc



Chinchilla: $C^{ch}C^{ch}$, $C^{ch}C^h$, or $C^{ch}c$

Levels of Dominance

Full Color	C
Chinchilla	c^{ch}
Himalayan	c^h
Albino	c^a



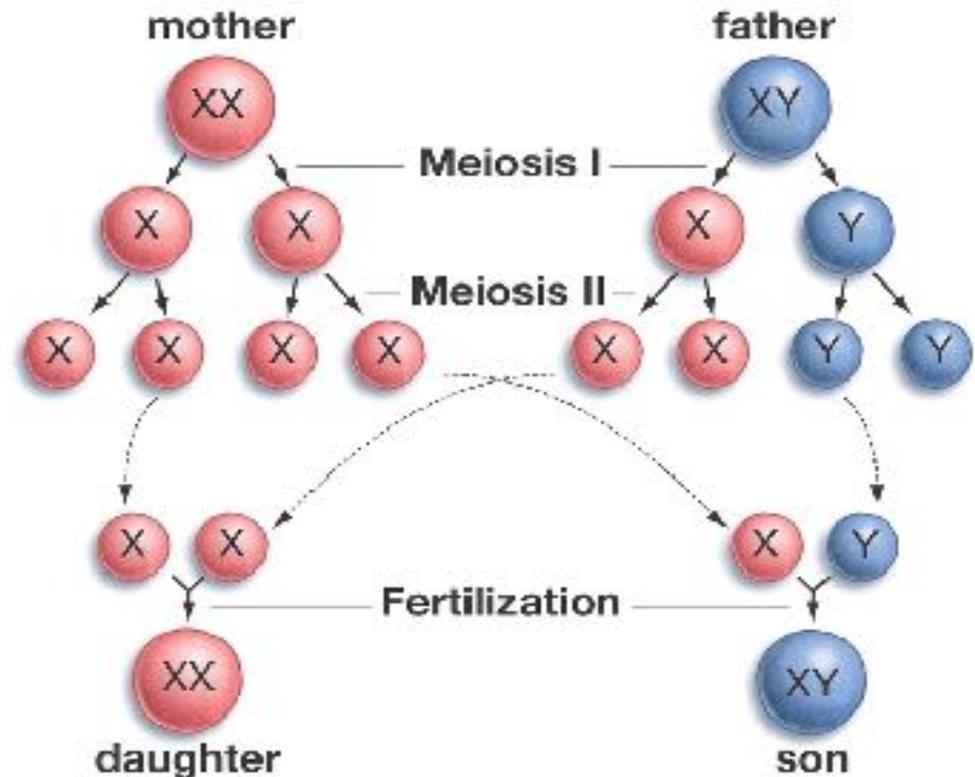
Himalayan: C^hC^h or C^hc



Albino: cc

Sex-Linked Traits

- Sex-linked means traits are found on the sex chromosomes (X or Y).
- These traits do not follow normal inheritance patterns.
 - Y-linked - Only males carry the trait
 - X-linked - Sons inherit the trait from normal parents.





X Y

Hemophilia

- Hemophilia is a recessive X-linked disorder.
- Daughters of an affected male are carriers for the disorder.

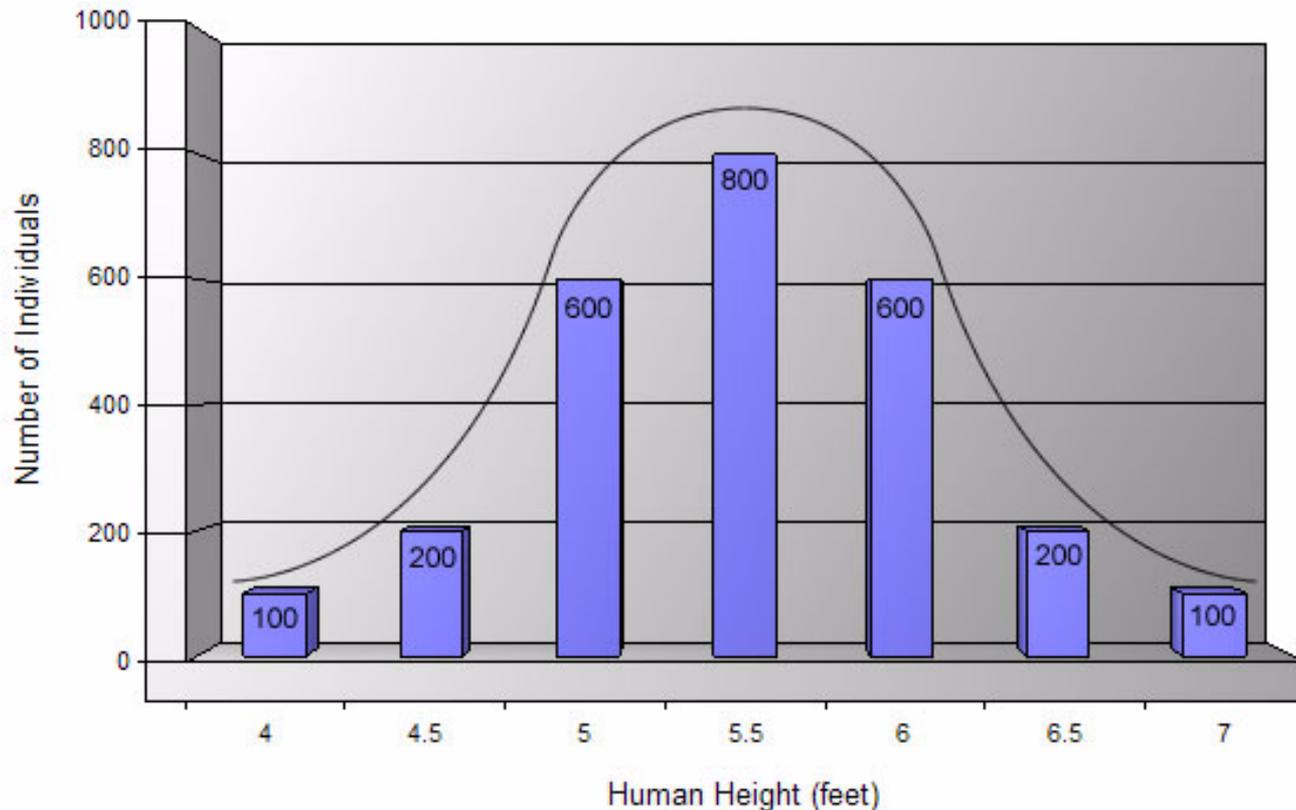
	X^H	Y
X	XX^H	XY
X	XX^H	XY



Hemophilia

Polygenic Traits

- Traits controlled by two or more genes are called **polygenic traits**.
- A bell curve is characteristic of polygenic traits.



Epistasis

- **Epistasis** is when a gene at one locus affects the expression of alleles at another separate gene locus.
- Epistatic interactions among products of two gene pairs affect coat color in Labrador retrievers.



EB Eb eB eb

EB	EEBB	EEBb	EeBB	EeBb
Eb	EEBb	EEbb	EeBb	Eebb
eB	EeBB	EeBb	eeBB	eeBb
eb	EeBb	Eebb	eeBb	eebb

B = black melanin
 b = brown melanin
 E = melanin deposited in fur
 e = reduced melanin in fur