

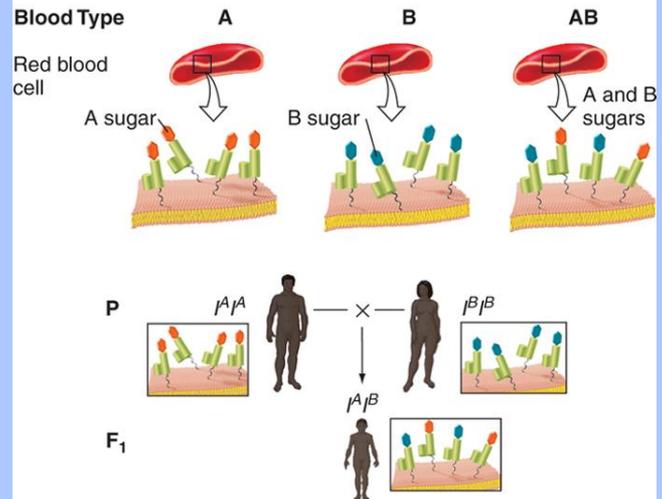
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(a) *Antirrhinum majus* (snapdragons)



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(b) Codominant blood group alleles



Deduced map positions

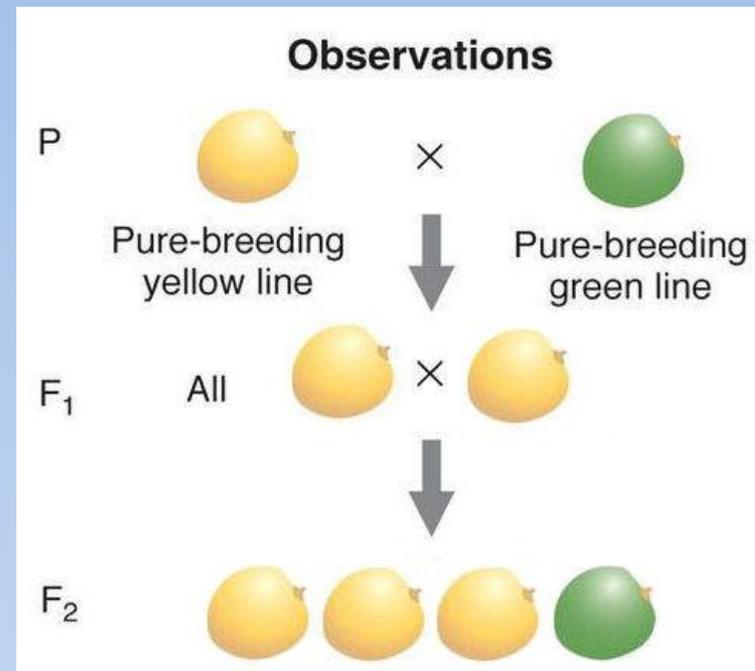
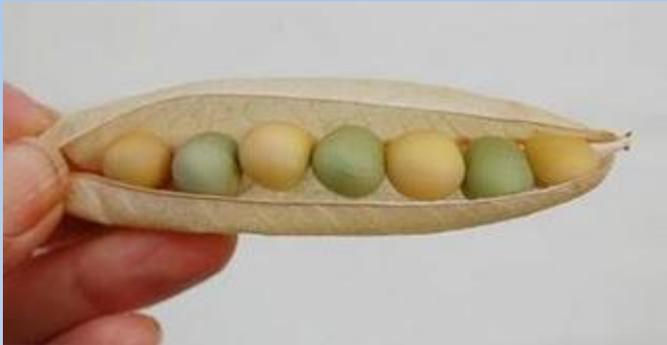


EXTENSÕES DAS LEIS DE MENDEL

Caráter discreto:

Heranças Monogênica: determinada por um único gene

Cruzamento de Ervilhas por Mendel



Herança Monogênica:

Fenótipo: 3:1 amarelas:verdes

Genótipos: 1:2:1 = YY, Yy, yy

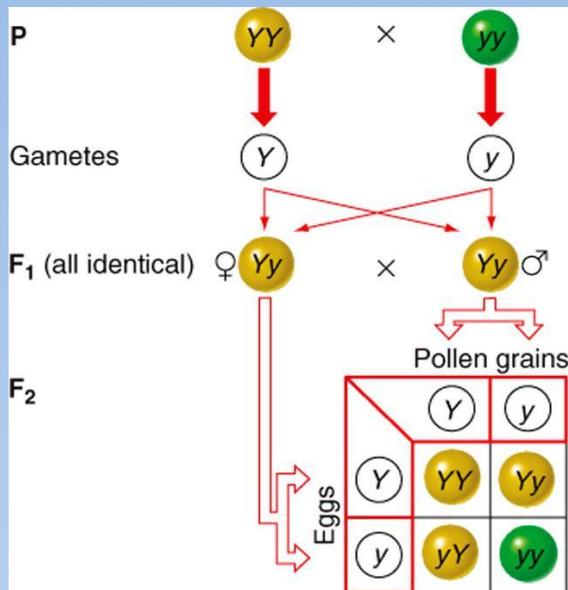
YY e Yy = ervilhas amarelas

Yy = ervilhas verdes

Um Locus e dois alelos:

Alelo Y dominante

Alelo y recessivo



Extensões das heranças Mendelianas

- Herança monogênica
 - Alelos apresentam desvios da dominância completa e recessividade
 - Diferentes formas de uma gene não são limitadas a dois alelos
 - Mais de um gene determina um fenótipo/trato

Dominância incompleta em snapdragons (Boca de Dragão)

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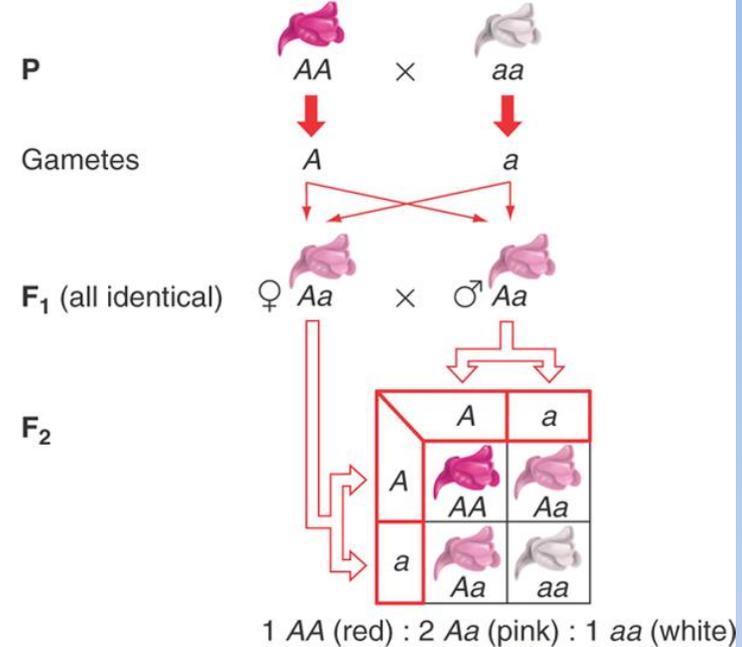
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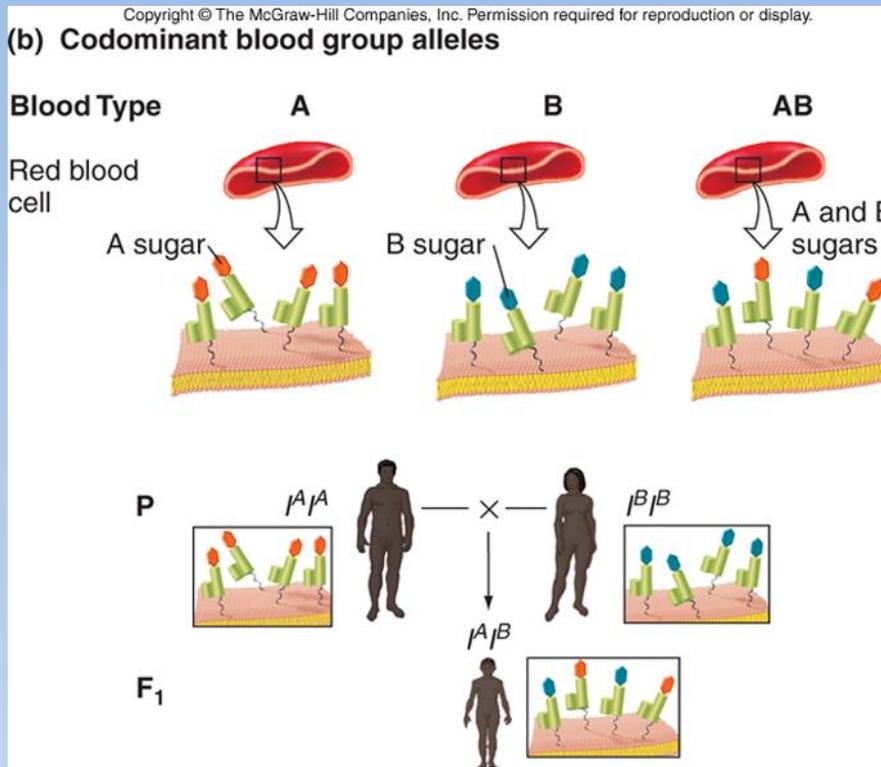
(b) A Punnett square for incomplete dominance



Efeito fenotípico: 1:2:1 ao invés de 3:1

Co-dominância

- Híbridos da F1 apresentam fenótipo de ambos os pais
- Razões fenotípicas são iguais as razões genotípicas



Um gene pode ter mais que dois alelos

- Gene pode ter alelos múltiplos que segregam na população
- Apesar de poderem existir muitos alelos na população, cada indivíduo só pode portar no máximo dois tipos de alelos
 - Tipo sanguíneo ABO
 - 3 alelos
 - 6 genótipos possíveis: $I^A I^A$, $I^B I^B$, $I^A I^B$, $I^A i$, $I^B i$, ou ii

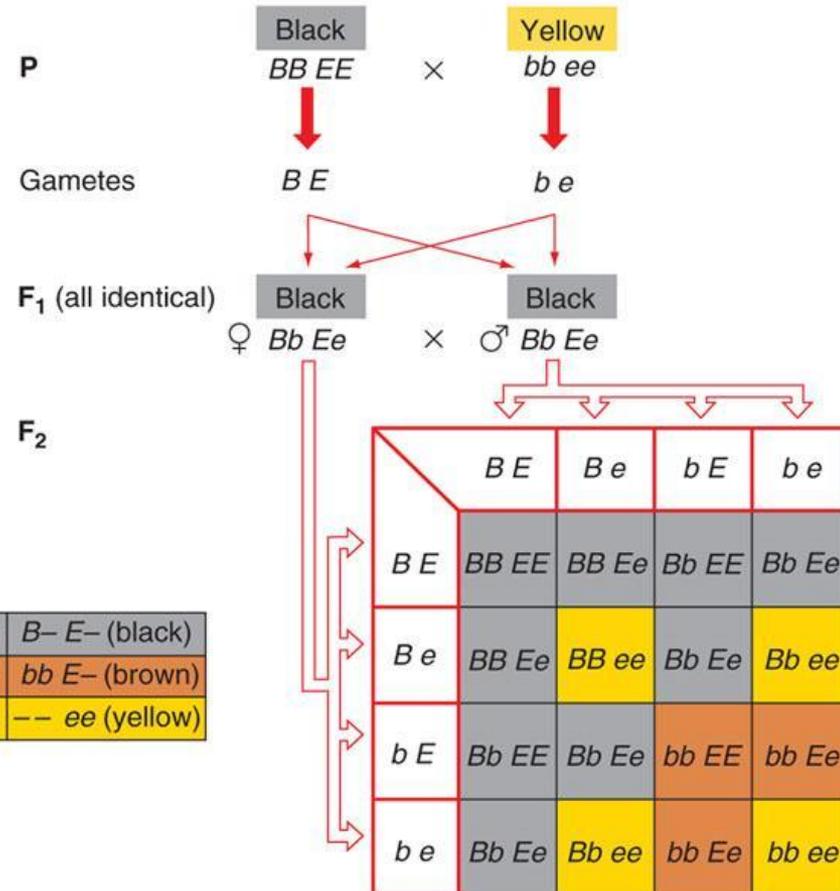
Epistasia – uma alelo de um gene mascara o efeito dos outros alelos de outro gene

Labrador

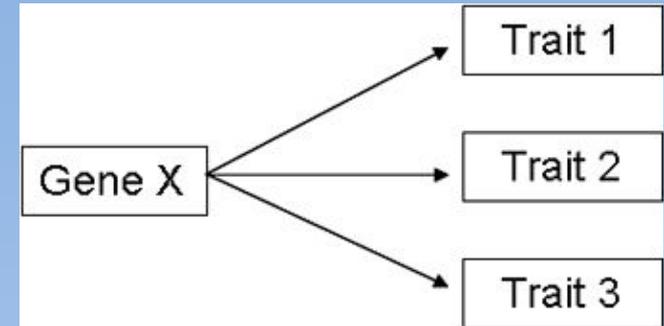


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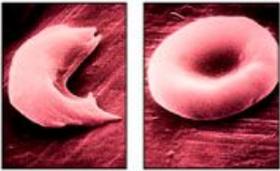
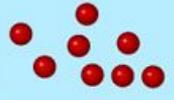
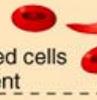
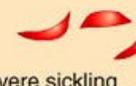
(a) A dihybrid cross showing recessive epistasis



Pleiotropia: um único gene contribui para uma serie de características visíveis



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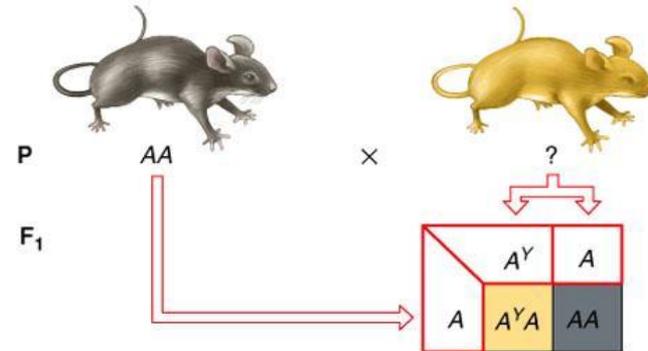
Phenotypes at Different Levels of Analysis	Normal	Carrier	Diseased	Dominance Relations at Each Level of Analysis
	AA	AS	SS	
 (a) β-globin polypeptide production				A and S are codominant
Red blood cell shape at sea level	Normal 	Normal 	Sickled cells present 	A is dominant S is recessive
Red blood cell concentration at sea level	Normal 	Normal 	Lower 	
Red blood cell shape at high altitudes	Normal 	Sickled cells present 	Severe sickling 	A and S show incomplete dominance
Red blood cell concentration at high altitudes	Normal 	Lower 	Very low, anemia 	
Susceptibility to malaria	 Normal susceptibility	 Resistant	 Resistant	S is dominant A is recessive

(b)

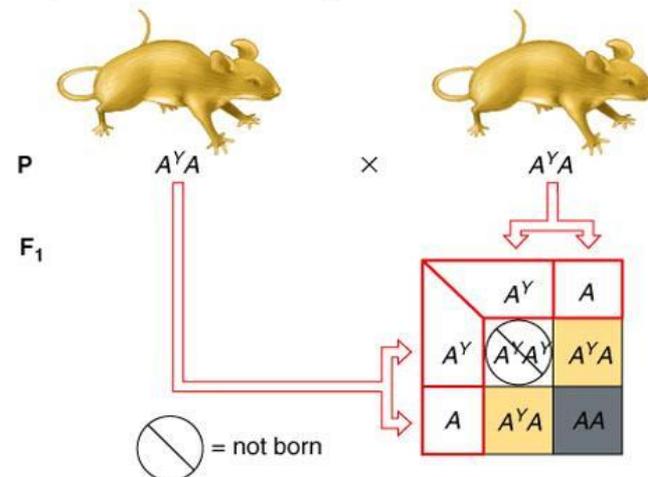
Letalidade do homozigoto – genótipo homozigoto não nasce ou sobrevive a idade adulta

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(a) All yellow mice are heterozygotes.



(b) Two copies of A^Y cause lethality.



Penetrância: alguns indivíduos da população tem um genótipo em particular mas não manifestam o fenótipo. Retinoblastoma é herança dominante (gene RB1) mas com 75% de penetrância.

