DIHYBRID CROSSES

* the proportion of round : wrinkled and the proportion of yellow : green.
* the monohybrid rules remain <u>unchanged</u>.

All stay equal → ≠ is the # of alleles.

DiHYBRiD CROSS

2 + alleles →

- Y = yellow (x = Yory)
- R = Rounded (x = R or r)
- yy = green
- rr = wrinkled

P generation

YYRR × yyrr

F1 Generation

YyRr

phenotype = ●

F2 generation

gametes of heterozygous P

gametes of heterozygous	YR	yR	Yr	yr
YR	YYRR	YyRR	YYRr	YyRr
yR	YyRR	yyRR	YyRr	yyRr
Yr	YYRr	YyRr	YYrr	Yyrr
yr	YyRr	yyRr	Yyrr	yyrr

F2 Generation

- Phenotypic ratio:

● : 9 ● : 3

● : 3 ● : 1

PUNNETT SQUARE

Exercice : F_1 → Aa Bb Cc Dd x Aa Bb Cc Dd

Calculate (doing a Punnett square) the probability of having a aa BB Cc Dd offspring ? (for Friday)

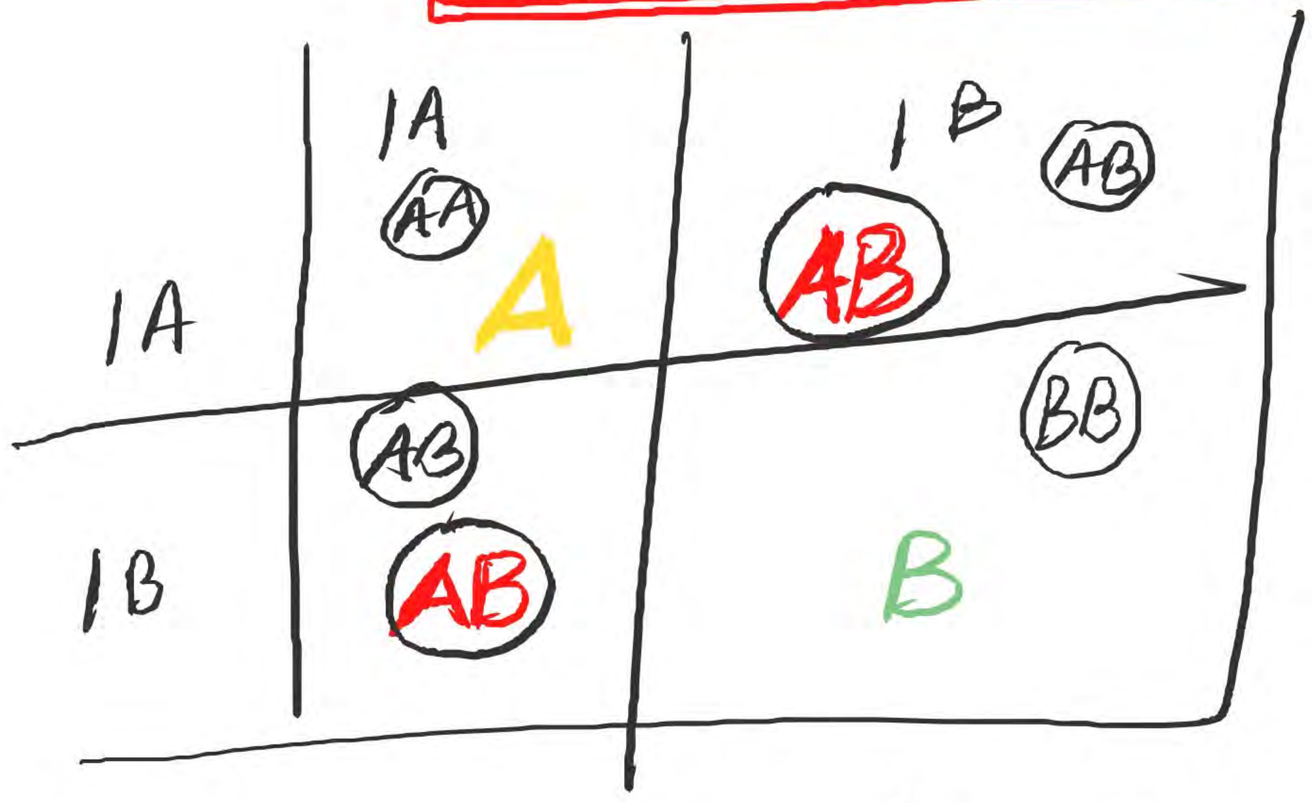
F_2

A, B, C, D } dominant

a, b, c, d } recessive.

OTHER TYPE OF DOMINANCE
(incomplete dominance)

Codominant Cross



Punnett square

Genotype:	Genotype ratio
AA	1
AB	2
BB	1

Inheritance of the ABO blood system in human

	I^A	I^B	$i_{(o)}$
I^A	A $I^A I^A$	AB $I^A I^B$	A $I^A i$
I^B	AB $I^B I^A$	B $I^B I^B$	B $I^B i$
$i_{(o)}$	A ii^A	B ii^B	O ii

i absence of A or B ($=o$)

A : 3

B : 3

AB : 2

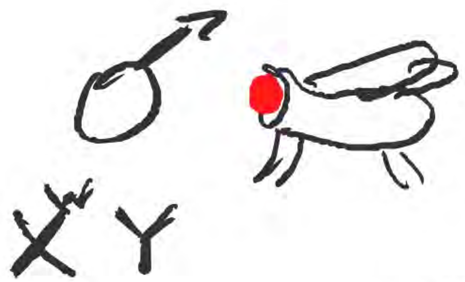
O : 1

$\Rightarrow$ CODOMINANCE CROSS

Punnett square analysis of a sex-linked trait:

Drosophila (fly)

- Red eyes -



X^wY

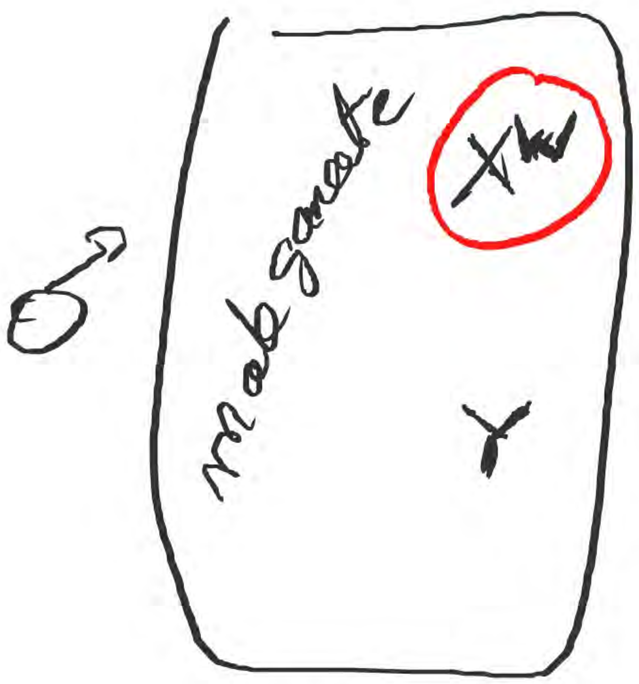
×

white eyes

X^wX^w

W or w

♀ female gametes: X^w X^w ← recessive homozygous w



T

homozygous dom.

X^WX^w ♀	X^WX^w ♀
YX^w ♂	YX^w ♂

All females of F_2 have RED EYES

All mals of F_2 have "white" eyes

EPISTASIS

* Agouti mice (brown)
* Black mice.
* Albinos mice.

F_1 : AaCc (1) × AaCc (2)

GENOTYPE

(2) \ (1)	AC	aC	Ac	ac
AC	AACC AGOUTI	AaCC AGOUTI	AACc AGOUTI	AaCc AGOUTI
aC	AaCC AGOUTI	aaCC BLACK	AaCc AGOUTI	aaCc BLACK
Ac	AACc AGOUTI	AaCc AGOUTI	AAcc ALBINOS	Aacc ALBINOS
ac	AaCc AGOUTI	aaCc BLACK	Aacc ALBINOS	aacc ALBINOS

aa = black

cc = albinos

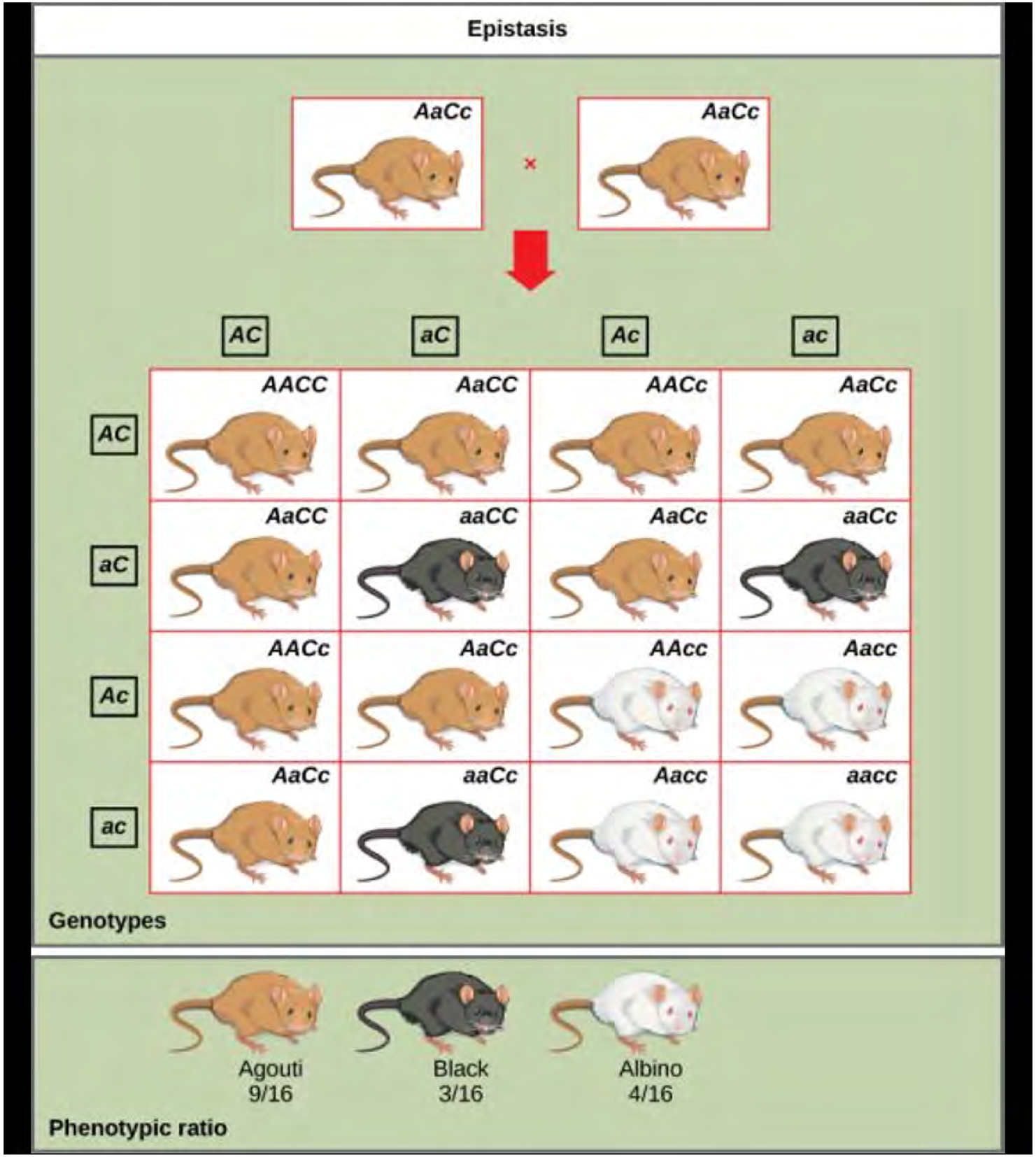
if A ⊕ C → BROWN

if cc → ALBINOS

if aa and no cc
↳ BLACK

PHENOTYPE RATIO : AGOUTI 9/16 : BLACK 3/16 : ALBINOS 4/16 = 100% Phenotype

Epistasis


AaCc
×
AaCc
AC
aC
Ac
ac
AACC
AaCC
AACc
AaCc
AaCC
aaCC
AaCc
aaCc
AACc
AaCc
AAcc
Aacc
AaCc
aaCc
Aacc
aacc
Genotypes
Agouti
9/16
Black
3/16
Albino
4/16
Phenotypic ratio