Gene interactions and sex linked inheritance

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https://www.youtube.com/watch?v=i-0rSv6oxSY

https://www.youtube.com/watch?v=qIGXTJLrLf8

In several cases genes interact with each other when they create a trait.

One gene can mask or hide the expression of another gene and can change the typical dihybrid ratio (9:3:3:1)

These genes/alleles are called epistatic genes/alleles the interaction is called epistasis

Example of recessive epistasis: inheritance of horses coat colour and labrador retrievers' fur colour

Gene interactions and sex linked inheritance

Labrador retrievers’ fur colour inheritance:

relationship between 2 genes with dominant-recessive inheritance causes the colour of their fur

dominant B gives black colour

recessive b gives brown

dominant E has no impact on black or brown fur colour

recessive e blocks the pigment deposition in the fur causes yellow fur

Gene interactions and sex linked inheritance

Labrador retriever phenotypes and genotypes:

black: BBEE, BbEE, BbEe, BBEe

brown: bbEE, bbEe

yellow: BBee, Bbee, bbee

Gene interactions and sex linked inheritance

Hybridization experiments:

P: black (BBEE) x yellow (bbee)

F1: black (BbEe)

P: black (BbEe) x black (BbEe)

F2: 9 black

3 brown

4 yellow

https://www.youtube.com/watch?v=zxhBM
5c 6:27

EEBB * eebb
(black) ↓ (yellow)
EeBb
(black)

EeBb * EeBb
(black) (black)

Black : Chocolate : Yellow
9 : 3 : 4

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

Sex linked inheritance

There are several traits that are inherited through the X chromosome

Sex linked inheritance example is the fur colour inheritance of calico cats

The red and black colour inherited on the X chromosome, so males can be black or orange, while females can also be black or orange, but tricolour as well

Inheritance of gender/sex

Genotypes:

black male : XbY

orange male: XBY

black female: XbXb

orange female: XBXB

calico female: XBXb