

Healthy = P
 ① PKU p

	P	p	
P	PP	Pp	
p	Pp	pp	a) 1/4 has the disease

b) 2/4 are heterozygous

c) 1/4 is homozygous dominant

② E = unattached earlobes
 e = attached

	E	E	
e	Ee	Ee	
e	Ee	Ee	

a) 100% will have unattached

	E	e	
E	EE	Ee	
e	Ee	ee	

b) only 1/4 will have attached lobes.

③

	R	W	
R	RR	Rw	
W	Rw	ww	

Genotypic ratio

1: 2: 1

RR: Rr: rr

phenotypic

1: 2: 1

Red: Pink: White

(4)

	B	b
b	Bb	bb
b	Bb	bb

Black parent = Bb

Brown parent = bb

offspring = bb

(5)

	B	B
b	Bb	Bb
b	Bb	Bb

All offspring are Bb

(6)

A = Blood type A allele

B = Blood type B allele

O = Blood type O allele

mother = OO

Child = A? → child must be AO because
mom had to give one O.

DAO Genotype: AB or AO

DAO phenotype: could be AB, or A

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parent set #1
Mr. Smith - A
Mrs. Smith - B
33
Baby 1 = Type O

parent set #2
Mr. Jones - A
Mrs. Jones - A
33
Baby 2 = B

The babies were mixed up, two A type of parents could not ~~have~~ have a type B baby. However two type A parents could have had a type O baby if they were both AO and AO.

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	A	O
A	AA	AO
B	AB	BO

Answer:
A
B
or
AB

9

parents #1
M: Black - Bb
F: Black - Bb
F₁ = white = bb

parents #2
M: white = bb
F: Black = B?
F₁: black = 2 white offspring.
Bb and bb

x

~~white = b~~
~~Black = B~~
Black = B
white = b

The mother of the black F₁ is uncertain in regards to genotype.

(10)

B b

b	Bb	bb
b	Bb	bb

$F_1 = 1/2 Bb$ and $1/2 bb$

(crosses with the brown parent)

a)

	B	b
B		
b		

b)

	B	b
b		
b		

(crosses with the white parent)

	b	b
B		
b		

	b	b
b		
b		

(11)

F = freckles

f = none

both parents = Ff

	F	f
F	FF	Ff
f	Ff	ff

25% chance of no freckles.

(12) Sick cell is x-linked recessive.

Mom = $X_N X_n$

X_N = normal allele

X_n = sick cell

Dad = $X_N Y$

	X_N	X_n
X_N	$X_N X_N$	$X_N X_n$
y	$X_N y$	$X_n y$

- $1/4$ will be sick cell

- $1/4$ will be carriers.

(13)

	X_N	X_n
X_N	$X_N X_N$	$X_N X_n$
y	$X_N y$	$X_n y$

$y y$ will be carriers

(14)

50% chance each time they have a baby.

(15)

X_H = healthy

X_h = hemophilic

X_H X_h

	X_H	X_h
X_H	$X_H X_H$	$X_H X_h$
y	$X_H y$	$X_h y$

- 50% chance her sons will have the disease
- daughters cannot be ~~carriers~~ hemophilic
- 50% of daughters can be carriers

(16)

parents

S	s
S	Ss
s	Ss
s	ss

expected

2 short
2 long

1/8 expected to be long.

(17)

	H	h
H	HH	Hh
h	Hh	hh

Test cross
pairs

$HH \cdot hh = 100\% Hh$
 $Hh \cdot hh = 50\% Hh, 50\% hh$
 $hh \cdot hh = 100\% hh$

(18)

	A	a
A	AA	Aa
a	Aa	aa

1/4 probability of an
albino child.

(19)

man $X_N y$ • woman $X_N X_n$

$X_N = \text{normal}$
 $X_n = \text{blind}$

	X_N	y
X_N	$X_N X_N$	$X_N y$
X_n	$X_N X_n$	$X_n y$

- All males color blind (50%)
- No females color blind

(20)

man = $X_N y$
woman = $X_N X_n$
Father = $X_n y$

	X_N	y
X_N	$X_N X_N$	$X_N y$
X_n	$X_N X_n$	$X_n y$