

BIO-341-01-0901: Enrichment Activity #9: Genetic Counseling Exercise

plin@mail.barry.edu [plin@mail.barry.edu]

Sent: Tuesday, April 21, 2009 11:25 AM

To: Lin, Peter

Keys

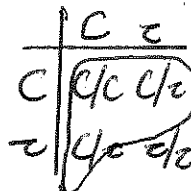
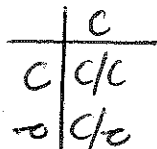
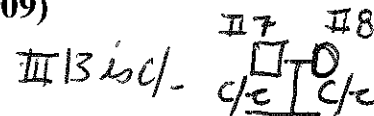
Enrichment Activity #9: Genetic Counseling Exercise (Due: 28Apr09)

albin@a) P(2 x 13 ---> c/c) = ? $\frac{1}{12}$

carrier b) P(2 x 13 ---> C/c) = ? $\frac{5}{12}$

homo normal c) P(2 x 13 ---> C/C) = ? $\frac{6}{12}$

III 2 is C/-



Complete Enrichment Activity #9 before 28 April 09.

Indicate your completion of EA#9 by posting your name in the Genetics Discussion Board under the "Enrichment Activity #9" Forum.

III 2 x III 13		Progeny			Scenario
C/-	C/-	a) c/c	b) C/c	c) C/C	
$\frac{1}{2} C/c$	$\frac{2}{3} C/c$	$\frac{1}{4}$	$\frac{2}{4}$	$\frac{1}{4}$	i)
	$\frac{1}{3} C/C$	0	$\frac{1}{2}$	$\frac{1}{2}$	ii)
$\frac{1}{2} C/C$	$\frac{2}{3} C/c$	0	$\frac{1}{2}$	$\frac{1}{2}$	iii)
	$\frac{1}{3} C/C$	0	0	1	iv)
Probability P		$\frac{1}{12}$ c/c albino	$\frac{5}{12}$ C/c carrier (heterozygous) normal	$\frac{6}{12}$ C/C homozygous normal	

$P(\text{normal}) = 1 - P(\text{albino}) = 1 - \frac{1}{12} = \frac{11}{12}$

$P(\text{normal}) = P(C/c) + P(C/C) = \frac{5}{12} + \frac{6}{12} = \frac{11}{12}$

Enrichment Activity #9

28 April 2009

(a) $P(2 \text{ is } \overset{C_1}{C_1} \times \overset{C_1}{B} \rightarrow \overset{\text{albino}}{c/c}) = ?$

$\frac{1}{12}$

$i/ + ii/ + iii/ + iv/ = \frac{1}{2} + 0 + 0 + 0 =$

$P(2 \text{ is } C/c) = \frac{1}{2}$

$P(B \text{ is } C/c) = \frac{2}{3}$

$P(C/c \times C/c \rightarrow c/c) = \frac{1}{4}$

Scenario

ii) $P(2 \text{ is } C/c \times B \text{ is } C/c \rightarrow c/c) = \frac{1}{12}$

$\frac{1}{2} \cdot \frac{2}{3} \cdot \frac{1}{4} = \frac{2}{24} = \frac{1}{12}$

Scenario

iv) $P(2 \text{ is } C/c) = \frac{1}{2}$

$P(B \text{ is } c/c) = \frac{1}{3}$

$P(C/c \times \overset{C/c}{c/c} \rightarrow c/c) = 0$

Scenario

iii) $P(2 \text{ is } c/c)$

$P(B \text{ is } C/c)$

$P(c/c \times C/c \rightarrow c/c) = 0$

Scenario

iv) $P(2 \text{ is } c/c)$

$P(B \text{ is } c/c)$

$P(c/c \times C/c \rightarrow c/c) = 0$

$$P(2 \text{ is } C_1 \times 13 \text{ is } C_2 \rightarrow C_3) = ?$$

$$i) + ii) + iii) + iv) = \frac{2}{12} + \frac{1}{12} + \frac{2}{12} + 0 = \frac{5}{12}$$

Scenario

i) $P(2 \text{ is } C_1) = \frac{1}{2}$

$P(13 \text{ is } C_2) = \frac{2}{3}$

$P(C_1 \times C_2 \rightarrow C_3) = \frac{2}{4}$

$P(2 \text{ is } C_1 \times 13 \text{ is } C_2 \rightarrow C_3)$

$\frac{1}{2} \cdot \frac{2}{3} \cdot \frac{2}{4} = \frac{4}{24} = \frac{1}{6}$

Scenario

ii) $P(2 \text{ is } C_1) = \frac{1}{2}$

$P(13 \text{ is } C_2) = \frac{1}{3}$

$P(C_1 \times C_2 \rightarrow C_3) = \frac{1}{2}$

$P(2 \text{ is } C_1 \times 13 \text{ is } C_2 \rightarrow C_3)$

$\frac{1}{2} \cdot \frac{1}{3} \cdot \frac{1}{2} = \frac{1}{12}$

Scenario

iii) $P(2 \text{ is } C_1) = \frac{1}{2}$

$P(13 \text{ is } C_2) = \frac{2}{3}$

$P(C_1 \times C_2 \rightarrow C_3) = \frac{1}{2}$

$P(2 \text{ is } C_1 \times 13 \text{ is } C_2 \rightarrow C_3) = \frac{2}{12}$

$\frac{1}{2} \cdot \frac{2}{3} \cdot \frac{1}{2}$

Scenario

iv) $P(2 \text{ is } C_1) = \frac{1}{2}$

$P(13 \text{ is } C_2) = \frac{1}{3}$

$P(C_1 \times C_2 \rightarrow C_3) = 0$

~~$\frac{1}{2} \cdot \frac{1}{3} \cdot 0$~~
 $P(2 \text{ is } C_1 \times 13 \text{ is } C_2 \rightarrow C_3) =$

$\frac{1}{2} \cdot \frac{1}{3} \cdot 0 = 0$

Cl- Cl- Romo normal

$$\textcircled{c} \quad P(2 \times 13 \rightarrow C/C) = ? \quad \textcircled{6/12}$$

$$i) + ii) + iii) + iv) = \frac{1}{12} + \frac{1}{12} + \frac{2}{12} + \frac{2}{12} =$$

Scenario i)

$$P(2 \text{ is } C/c) = \frac{1}{2}$$

$$P(13 \text{ is } C/c) = \frac{2}{3}$$

$$P(C/c \times C/c \rightarrow C/C) = \frac{1}{4}$$

$$P(2 \text{ is } C/c \times 13 \text{ is } C/c \rightarrow C/C) = \frac{2}{24} = \frac{1}{12}$$

$$\frac{1}{2} \cdot \frac{2}{3} \cdot \frac{1}{4}$$

Scenario ii)

$$P(2 \text{ is } C/c) = \frac{1}{2}$$

$$P(13 \text{ is } C/C) = \frac{1}{3}$$

$$P(C/c \times C/C \rightarrow C/C) = \frac{1}{2}$$

$$P(2 \text{ is } C/c \times 13 \text{ is } C/C \rightarrow C/C) = \frac{1}{12}$$

$$\frac{1}{2} \cdot \frac{1}{3} \cdot \frac{1}{2}$$

Scenario iii)

$$P(2 \text{ is } C/C) = \frac{1}{2}$$

$$P(13 \text{ is } C/c) = \frac{2}{3}$$

$$P(C/C \times C/c \rightarrow C/C) = \frac{1}{2}$$

$$P(2 \text{ is } C/C \times 13 \text{ is } C/c \rightarrow C/C) = \frac{2}{12}$$

$$\frac{1}{2} \cdot \frac{2}{3} \cdot \frac{1}{2}$$

Scenario iv)

$$P(2 \text{ is } C/C) = \frac{1}{2}$$

$$P(13 \text{ is } C/C) = \frac{1}{3}$$

$$P(C/C \times C/C \rightarrow C/C) = 1$$

$$P(2 \text{ is } C/C \times 13 \text{ is } C/C \rightarrow C/C) = \frac{1}{6} = \frac{2}{12}$$

$$\frac{1}{2} \cdot \frac{1}{3} \cdot 1$$

$$P(2 \times 13 \rightarrow C/C) = P(2 \text{ is } C- \times 13 \text{ is } C- \rightarrow C/C) =$$

$$i) + ii) + iii) + iv) = \frac{1}{12} + \frac{1}{12} + \frac{2}{12} + \frac{2}{12} = \frac{6}{12}$$