

# Lecture 13

Observed Genotype frequencies

Numbers	$\frac{7}{25} = .28$	$A_1A_1$	D
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6	$\frac{6}{25} = .24$	$A_1A_2$	H
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12	$\frac{12}{25} = .48$	$A_2A_2$	R
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## Allelic frequencies

$$p = D + H/2$$

$$p = (.28) + (.24)/2$$

$$p = 0.4$$

$$q = 1 - 0.4 = 0.6$$

## Expected Frequencies

$$p^2 = (.4)^2 = 0.16$$

$$2pq = 2(.4)(.6) = 0.48$$

$$q^2 = (.6)^2 = 0.36$$

## Expected Numbers

$$(.16)(25) = 4$$

$$(.48)(25) = 12$$

$$(.36)(25) = 9$$

$$\chi^2 = \sum \frac{(\text{obs} - \text{exp})^2}{\text{exp}} = \frac{(7 - 4)^2}{4} + \frac{(6 - 12)^2}{12} + \frac{(12 - 9)^2}{9}$$

$$= 6.25 \quad p = 0.01$$

## Inbreeding coefficient

$$F = \frac{H_0 - H}{H_0} = \frac{0.48 - 0.24}{0.48} = \frac{.24}{0.48} = 0.5$$