Boomer 211 - Beyond Mendel, Sex Linkage, Human Genetics

Remember: Mendel studied only simple inheritance

Non-Mendelian Inheritance Patterns

Incomplete Dominance:

Homework - perform P, F1, F2 crosses

Multiple Alleles: some genes have

Understand:

Phenotype	Genotype
Type A	
Type B	
Type O	
Type AB	

Codominance: both alleles

Nature/Nurture: environment

Morgan, Flies, Sex Linkage - 1910s

Genes Shown on Chromosomes

By now, scientists could see

Drosophila melanogaster:

Autosomes (flies have 3 pairs):

Sex Chromosomes (flies have 1 pair):

Wild Type:

Mutant:

Cross 1: True Parentals

At first, Morgan assumed eye color was autosomal/Mendelian:

But F2 was half unexpected: where all females red,

Morgan formed a new hypothesis:

Rule Three: For sex linkage, show alleles on X's (e.g. X^R) - none on Y's. Prediction must include gender. Use Mendelian letters for genes - not Morgan's (+/-) naming system.

Let's Show the P X P Cross to F1
P Gametes: red/female X white/male
Explain predictions

Let's Show the F1 X F1 Cross to F2
F1 Gametes: het/female X red/male
Explain predictions

Some Human Genetics

Pedigree Analysis:

Make sure you define shaded trait OR write phenotype below each person.

The following FYI traits are NOT on exam.

Gene	Dom Allele	Rec Allele
Chin Dimple		
Free Ear Lobes		
Widow's Peak		
Left Thumb Top		
Iris Pigmentation		

Sickle Cell Anemia

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- African Americans -
- Carriers -
- Defective
- Hom/Rec = ; Het =

Protects against tropical malaria - thus, selected among many equatorial races.

Cystic Fibrosis

-
- European Caucasions -
- Carriers -
- Defective
- High levels of secreted
- If untreated,

Huntington Disease

-
- Unstable -
-
- Gene function unclear
- Degenerative
- No good treatment -

Duchenne Muscular Dystrophy

-
- Male Bias -
- Defective anchoring protein between…
-
- Degenerative
- No good treatment -