

Genetics

Study guide

Chapter 7. Linkage

- Distinguish independent genes, complete linkage, and incomplete linkage (based on frequencies of gametes or testcross progeny).

Independent (no linkage)	Complete Linkage	Incomplete Linkage
-4 genetically different gametes in equal proportion. -Each has a different combination of alleles. 1:1:1:1 ratio	-Two genetically different gametes. -Two parental or non-crossover gametes in equal proportions. -Gene loci are close together. 1:1 ratio	-Crossing over -Two non-sister chromatids. -New allele combinations -4 different gametes -2 parental in = prop. (together >50%) -2 recombinant (<50%) Deviation from 1:1:1:1

Number of linkage groups = haploid number of chromosomes.

- Calculate genetic distance and gene order based on recombination frequency.

$R\% = \frac{\text{Number of recombinants}}{\text{Total number of progeny}} \times 100$

Number of recombinants always sum of 2 numbers.

If >50cM, crossover is expected to occur and behave as independent.

Farther apart: random crossover.

- Distinguish coupling vs. repulsion (allele arrangement, types and frequencies of gametes and testcross progeny). Be able to apply to complete linkage and to incomplete linkage.

Coupling	Repulsion
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JE Gale



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