Mendel's 2nd law: The law of independent assortment

During the formation of gametes,

The paired hereditary factors/UNLINKED genes *segregate independently* from other pairs

And by multiplying the probabilities of independent evens, the probability of the combined event can be obtained

Forward genetics: Approach to understanding biological function starting with random single-gene mutants and ending with detailed cell and biochemical analysis of them, often including genomic analysis

- 1. Choose biological property of interest
- 2. Find mutants affecting that property
- 3. Check mutants for single=gene inheritance
- 4. Identify time and place of actions of genes
- 5. Zero in on moleduclar nature of gene by genomic

To find out the phenotype/genotype of progeny OR to find out the genotypes of parents \rightarrow testcrosses

(1) Cross an individual of unknown heterozygosity with a fully recessive parent/tester \rightarrow progeny identity

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(2) Cross a dominant individual of unknown genotype (AA or Aa) with a fully recessive parent/tester → dominant parent identity

Number of phenotypic and genotypic classes expected from selfing of heterozygotes

-Assume bi-allelic genes showing complete dominance

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Number of segregating genes	Number of F ₂	Number of F ₂	Cross	Examples CO.					
	phenotypes	genotypes	Late3						
1	2	3	1 10 10 hyporid	1:2:1 phenotypic ratio, but only 3					
	- fr	bu .	cross	cellow seeds (AA, Aa) and 1 green seed (aa)					
² previe	2 K = 4	3x3ge	P ¹ lybrid cross	Parents OR Tryy					
				F1 F1 F1 F2 F1 F2 F3 F1 F1 F2 F3 F3 F3 F3 F3 <tr td=""> F3 F3<!--</td--></tr> <tr><td>3</td><td>2 x 2 x 2 = 8</td><td>3 x 3 x 3 = 27</td><td>Trihybrid cross</td><td>Example below -64 offspring combinations -27:9:9:9:3:3:3:1 phenotypic ratio of 9 phenotypes</td></tr>	3	2 x 2 x 2 = 8	3 x 3 x 3 = 27	Trihybrid cross	Example below -64 offspring combinations -27:9:9:9:3:3:3:1 phenotypic ratio of 9 phenotypes
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