## Part 1. Monohybrid, dihybrid, tri-hybrid crosses

## Monohybrid

Predictions:

1) Predicted phenotypic ratio of the F1 generation (parental cross)

Phenotype of parents:  $\stackrel{\bigcirc}{+}$  BW<sup>a</sup> x  $\stackrel{\bigcirc}{\rightarrow}$  +<sup>b</sup>

Genotype of parents:  $\bigcirc$  BWBW x  $\bigcirc$  ++

<u>+</u>	+
BW	BW+

Predicted phenotypic ratio of  $F_1$ : 1 or 100% + (wild)



## Dihybrid

<u>Question</u>: What is the pattern of inheritance in a dihybrid cross for which both parents are heterozygous and have mutation on different genes?

<u>Hypothesis</u>: A cross between two parents that have different alleles (The wild type allele + that expresses the dominant trait and the mutant alleles RI<sup>c</sup> and BW that express the recessive trait) at two genes will produce offspring following Mendel's first and second law.

## Assumptions:

- 1) Both parents are pure-bred or true-breeding individuals. Each parent's genotype is homozygous for the studied trait
- 2) The wild allele is dominant over the mutant allele

<sup>&</sup>lt;sup>a</sup> BW: Brown eyes mutant phenotype (character: eye color)

<sup>&</sup>lt;sup>b</sup> + : Wild type (non-mutant allele)

<sup>&</sup>lt;sup>c</sup> RI: Radius incompletus wings or incomplete wings mutant phenotype (character: wing vein)