**Monohybrid Crosses**

The simplest example of genetics / heredity is the passing on of a trait caused by a single gene (like tongue rolling). This simple example means a trait has only one gene causing it so, there can only be two possible alleles in the person. This type of inheritance pattern can be easily predicted by a process called monohybrid crosses.

Monohybrid inheritance patterns use a punnet square (the square box below) to predict what the offspring of parents could possibly be like:

e.g. 2 parents

- one is purebred tongue roller (TT)

- one is hybrid tongue roller (Tt)

Parent 1 Parent 2

TT Tt

Meiosis

Meiosis

T or T T or t

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Parent 1** | | |  | **Prediction** |
|  |  | **T** | **T** |  | (Genotype and phenotype) |
| **Parent 2** | **T** | TT | TT |  | * 100% offspring have the phenotype of tongue rolling (100% can roll tongue). * 50% are homozygous dominant genotype * 50% are heterozygous genotype |
| **t** | Tt | Tt |

* **Dominant alleles** are ones that mask other characteristics. We show them with a capital letter.
* **Recessive alleles** are masked by dominant ones. We show them by a lower case letter.
* **Homozygous recessive** = 2 lower case letter and displays recessive trait (bb).
* **Homozygous dominant** = 2 capital letters and displays dominant trait (BB)
* **Heterozygous** = 2 different letters and displays dominant trait (Bb)

**`Homo’** means same, and **`hetero’** means different.