**Blood Typing/ Multiple Alleles**

A number of human traits are the result of more than 2 types of alleles. Such traits are said to have **multiple alleles** for that trait.

Blood type is an example of a common multiple allele trait. There are 3 different alleles for blood type, (A, B, & O). A is dominant to O. B is also dominant to O. A and B are both codominant.





------------------ ------------------

**Table Two: Distribution and Characteristics of Human Blood Factors**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Blood Type** | **Distribution in USA (%)** | **Antigen on Red Blood Cell** | **Antibody in Serum Plasma** | **Will Clot with Blood From These Donors** | **Can Receive From** | **Can Give to:** |
| **O** | **48** | **None** | **Anti-A, Anti-B** | **A, B, AB** | **O** | **All** |
| **A** | **42** | **A** | **Anti-B** | **B, AB** | **A & O** | **A & AB** |
| **B** | **7** | **B** | **Anti-A** | **A, AB** | **B & O** | **B & AB** |
| **AB** | **2** | **A & B** | **None** | **None** | **All** | **AB** |

**Type O Blood: Universal Donor as it contains no A or B antigens, so the receivers' blood will not clot when given the O blood.**

**Type AB Blood: Universal Receiver, as it contains no Anti-A or Anti-B antibodies in its plasma. It can receive all blood types.**

**Antigen: Protein on the surface of the blood cell. (Allele A makes A antigen. Allele B makes B antigen. Allele O makes no antigens.)**

**Antibody: Protein in plasma that reacts with specific antigens that enter the blood (usually something that isn't supposed to be there!). (Ex.: Anti-A is an antibody that recognizes A-antigen, binds to it (lock & key), then causes clumping together or clotting of similar A-antigens.)**