

Complex Patterns of Inheritance

Mendel studied traits only influenced by one gene with two alleles. We know now that some inherited traits have complex patterns of inheritance.

What are types of dominance?

Recall what you learned from Lesson 1 about dominant alleles and recessive alleles. The presence of one dominant allele results in a dominant phenotype in a pea plant. Not all allele pairs, however, have a dominant-recessive interaction. ✓

What is incomplete dominance?

Sometimes it seems that traits are blends of alleles. Alleles show incomplete dominance when they produce a phenotype that is a blend of the parents' phenotypes. For example, a pink camellia flower results from incomplete dominance. If you cross a white camellia flower and a red camellia flower, you will get a camellia with pink flowers.

What is codominance?

Another type of interaction between two alleles is the human blood type AB. When both alleles can be observed in a phenotype, this type of interaction is called codominance. If you inherited the B allele from one parent and an A allele from the other parent, you will have type AB blood.

| Human ABO Blood Types | |
|-----------------------|----------------------|
| Phenotype | Possible Genotypes |
| type A | $I^A I^A$ or $I^A i$ |
| type B | $I^B I^B$ or $I^B i$ |
| type O | ii |
| type AB | $I^A I^B$ |

What are multiple alleles?

If a gene has more than two alleles, it is said to have multiple alleles. Besides codominance, the human ABO blood group is also an example of a trait that is determined by multiple alleles. There are three different alleles for the ABO blood type— I^A , I^B , and i . The I^A and I^B alleles are codominant to each other, but both are dominant to the i allele. A person can only inherit two of these alleles—one from each parent, as shown in the table above.

Academic Vocabulary

complex (kum PLEKS) (adj)
made up of many parts

✓ Reading Check

- 4. Summarize** What results when a dominant allele is present in a pea plant?
-

Picture This

- 5. Identify** Which blood type is characterized by codominance?
-