

FANCONI - Possible similar mode of Inheritance

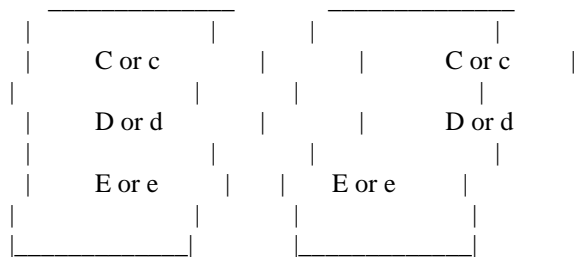
The one constant we have had in FS in Basenjis is that around 15% of the US population is affected.

“In 85% of people, the Rhesus Factor is positive (Rh+). For the other 15%, the Rh factor is negative (Rh-).” 15% of humans are Rh negative.

<http://waynesword.palomar.edu/lmexer5.htm>

Rh Factor: Another example of Polygenic Inheritance

Rh Factor: Another interesting example of polygenic inheritance is the Rh factor. Unlike the A-B-O blood types where all the alleles occur on one pair of loci on chromosome pair #9, the Rh factor involves three different pairs of alleles located on three different loci on chromosome pair #1. In the following diagram, 3 pairs of Rh alleles (C & c, D & d, E & e) occur at 3 different loci on homologous chromosome pair #1. Possible genotypes will have one C or c, one D or d, and one E or e from each chromosome. For example: CDE/cde; CdE/cDe; cde/cde; CDe/CdE; etc.



Homologous Chromosome Pair #1
(Showing 3 loci with 2 alleles per locus)

In order to determine how many different genotypes are possible, you must first determine how many different gametes are possible for each parent, then match all the gametes in a genetic checkerboard (See the following Table 3). Although the three pairs of genes are linked to one homologous pair of chromosomes, there are a total of eight different possible gametes for each parent: CDE, CDe, CdE, Cde, cDE, cDe, cdE, and cde. This number of gametes is based on all the total possible ways these genes can be inherited on each chromosome of homologous pair #1. [It is not based on the random assortment of these genes during meiosis in the parents because all three genes are closely linked together on the same chromosome; therefore, all three genes tend to appear together in the same two gametes: CDE and cde.]

The possible different genotypes are shown in the following Table 3:

Gametes	CDE	CDe	CdE	Cde	cDE	cDe	cdE	cde
CDE	CDE/ CDE	CDE/ CDe	CDE/ CdE	CDE/ Cde	CDE/ cDE	CDE/ cDe	CDE/ cdE	CDE/ cde
CDe	CDe/ CDE	CDe/ CDe	CDe/ CdE	CDe/ Cde	CDe/ cDE	CDe/ cDe	CDe/ cdE	CDe/ cde
CdE	CdE/ CDE	CdE/ CDe	CdE/ CdE	CdE/ Cde	CdE/ cDE	CdE/ cDe	CdE/ cdE	CdE/ cde
Cde	Cde/ CDE	Cde/ CDe	Cde/ CdE	Cde/ Cde	Cde/ cDE	Cde/ cDe	Cde/ cdE	Cde/ cde
cDE	cDE/ CDE	cDE/ CDe	cDE/ CdE	cDE/ Cde	cDE/ cDE	cDE/ cDe	cDE/ cdE	cDE/ cde
cDe	cDe/ CDE	cDe/ CDe	cDe/ CdE	cDe/ Cde	cDe/ cDE	cDe/ cDe	cDe/ cdE	cDe/ cde
cdE	cdE/ CDE	cdE/ CDe	cdE/ CdE	cdE/ Cde	cdE/ cDE	cdE/ cDe	cdE/ cdE	cdE/ cde
cde	cde/ CDE	cde/ CDe	cde/ CdE	cde/ Cde	cde/ cDE	cde/ cDe	cde/ cdE	cde/ cde

Table 3. Polygenic inheritance in the Rh blood factor. Every genotypic combination with DD or Dd is classified as Rh Positive (red). Every genotypic combination with dd is classified as Rh Negative (blue).