

Name _____

http://www.zerobio.com/drag_gr11/pedigree11_flash.htm

Visit the web page above. Go through the four genetics problems with pedigrees. Solve each problem by building the pedigrees and answering the quiz problems.

Tongue Rolling

The ability to roll your tongue is caused by a dominant gene (R). If you can NOT roll your tongue, you are a non-roller and must be homozygous recessive (rr).

A father can NOT roll his tongue but a mother can. Of their four children, one daughter can NOT roll her tongue. The other daughter and both sons can roll their tongues.

1. What percent of the offspring are homozygous non-rollers?
2. What percent of the offspring are heterozygous rollers?
3. Can the parents produce a homozygous dominant child?
4. How could the cross (father x mother) be written using the “dash” technique for unknown genes?

Eye Color

The color of your eyes is caused by pigment molecules in the iris, the ring that surrounds the black pupil in the center. While eye color is actually more complicated than this, dark eyes (such as brown or black) is dominant (E) and light eyes (such as blue or grey) is recessive (e).

A father and a mother both have brown eyes. Their two sons have blue eyes and their two daughters have brown eyes. One daughter carries the gene for blue eyes, the other does not.

1. Type the cross for the parents (father x mother).
2. Is the mother homozygous or heterozygous?
3. What percent of the children are homozygous recessive?
4. If one son gets married and all his children have brown eyes, what must the genotype of his wife be?

Diabetes

Diabetes is a disorder of the pancreas in which insulin cannot be produced or is not effective. As a result, blood sugar cannot be properly controlled. Diabetics have a homozygous recessive genotype (dd).

A father carries the recessive gene for diabetes and a mother does not (generation 1). They have three children (generation 2), a daughter and two sons, none of them have diabetes. The daughter marries a man who does not carry the gene for diabetes. They have one child, a girl, who is a carrier (generation 3).

1. Can the parents in generation 1 produce a child with diabetes?
2. How many individuals in the entire generation 2 suffer from diabetes?
3. If the girl in generation 3 does not suffer from diabetes, how could you write her genotype?
4. What genotype must the boys in generation 3 marry so their children do not suffer from diabetes?

Hypertension

Hypertension is high blood pressure. This can be caused by many factors including narrowing of blood vessels or over activity of the heart. The inherited form of hypertension is a recessive disorder (hh).

A normal man marries a woman with hypertension (generation 1). They have 3 children, two sons and a daughter (generation 2). The daughter marries a man with hypertension and they have a daughter who also suffers from the disorder (generation 3).

1. Type the cross for the parents (father x mother).
2. In generation 2, what percent are homozygous dominant?
3. Can the parents in generation 2 produce any carrier offspring?
4. What is the probability that the child in generation 2 gets hypertension?