

## Human Monogenic Traits Punnett Squares: Monohybrid Cross

Directions: Answer the following questions.

Please make sure that your letters look different in capital and lowercase form.

Express probability in percentages unless asked for a ratio.

Make sure you express genotypic and phenotypic ratios in the proper format.

1. A man is heterozygous and can roll his tongue (Rr). His wife is homozygous recessive for tongue rolling (rr).

a) Draw the Punnett square for this cross:

\_\_\_\_\_ x \_\_\_\_\_

b) What would the genotypic ratio be this genetic cross?

c) What phenotypes could a child from these parents possibly have?

What is the likelihood of the child having each of these phenotypes?

2. A woman with detached earlobes and a man who also has detached earlobes have a child with attached earlobes.

a) What are the genotypes of the parents in this cross? Draw a Punnett square.

b) What is the probability that they will have another child with attached earlobes?

c) Is it possible for these parents to have a child that is homozygous dominant for earlobes? Explain.

3. A man is homozygous recessive and his wife is homozygous dominant for eye pigment.

a) Draw the Punnett Square.

b) What will the genotypic ratio be for cross between them?

c) What would the phenotypic ratio be?

4. A man is heterozygous for the widow's peak trait, and so is his wife.

a) Draw the punnett square for this cross.

b) What is the probability that the couple will have a child that is heterozygous for this trait? What will this child's phenotype be?

c) What is the probability that the couple will have a child that is homozygous recessive for this trait? What will this child's phenotype be?

d) What is the probability that the couple will have a child that is homozygous dominant for this trait? What will this child's phenotype be?

5. In humans, the hitchhiker's thumb is a recessive trait. Ms. Gram does not have a hitchhiker's thumb. Her mother has a hitchhiker's thumb, but her father does not.

a) What is Ms. Gram's phenotype?

What is her genotype?

b) What is her mom's genotype?

c) What are the possible genotypes for her father?

Show all possible Punnett squares for the cross between her mother and father.

d) How could you figure out the genotype for her father?