

## Sex Linked Traits

X-linked traits come from genes that are located on the X chromosome, and not on the y. (Remember women are XX and men are Xy). For example, hemophilia is a genetic disorder where a person can not form a blood clot. Hemophilia is a recessive sex-linked trait.

**X<sup>H</sup> or X<sup>h</sup>** The y chromosome stays blank in these examples because it does not carry an allele.

For the following questions take a single piece of unlined paper and fold it so it has four equal sized boxes when unfolded. Write your name up in the upper left hand corner and then number the boxes in the upper right hand corner. Solve one problem per box. You must show your Punnett square for each problem.

1. Cross a carrier female with a male without hemophilia.
  - a. What are the expected genotypic/phenotypic ratios?
2. Cross a carrier female with a male with hemophilia.
  - a. What are the expected genotypic/phenotypic ratios?
3. Cross a female with hemophilia with a male without hemophilia.
  - a. What are the expected genotypic/phenotypic ratios?
4. As a male, which member of your family should you look at to tell if you have hemophilia?
  - a. Explain why. (Use a punnett square in your answers)

## Incomplete Dominance

The size of a Bio 300 student's bladder is an inherited trait. It is controlled by a single gene that has two alleles that are incompletely dominant.

**BB = Big Bladder      Bb = Medium Bladder      bb = Small Bladder**

It also happens to be true that the propensity for turning in your homework is an X-linked trait.

**X<sup>I</sup>X<sup>I</sup> will turn in homework**

**X<sup>i</sup>X<sup>i</sup> will turn in late work**

1. Cross a Big bladder male who turns in work late with a medium bladder female who is heterozygous for turning in work. What are the expected genotypic/phenotypic ratios?
2. Cross a Big bladder female who turns in work late with a medium bladder male who turns in work on time. What are the expected genotypic/phenotypic ratios?
3. If a baby boy is a Medium bladder late work turner inner, what are all of the possible combinations of parents that could have created him if we know that Mom has a small bladder?