Dominant Disease

Huntington's Disease

This neurological disorder is caused by a dominant allele. Symptoms do not reveal themselves until one is in their 30’s and 40’s.
THE FOLLOWING GENETIC DISEASES ARE PASSED DOWN BY RECESSIVE ALLELES.

1) **CYSTIC FIBROSIS:**
   - 1/20 WHITE AMERICANS ARE CARRIERS
   - 1/2000 CHILDREN GET THE DISEASE.
   * SYMPTOMS: ACCUMULATION OF MUCUS IN LUNGS AND DIGESTIVE TRACT DUE TO DEFECTIVE PLASMA MEMBRANE PROTEIN.

**TAY-SACHS DISEASE:**
* CAUSED BY A DEFECTIVE PROTEIN ENZYME (RECESSIVE TRAIT) THAT NORMALLY BREAKS DOWN LIPIDS.
* INCREASE OF LIPIDS IN NERVE CELLS CREATES NEUROLOGICAL PROBLEMS.
* COMMON TO JEWISH PEOPLE.

**PHENYLKETONURIA (PKU):**
* CAUSED BY A ABSENSE OF A PROTEIN ENZYME THAT BREAKS DOWN THE AMINO ACID PHENYLALANINE.
* TOO MUCH PHENYLALANINE DAMAGES THE CENTRAL NERVOUS SYSTEM.
* COMMON TO SCANDANAVIAN PEOPLE.
The Test Cross
In certain situations, it is difficult to determine the genotype of a parent.

For example, a tall pea plant can be TT or Tt. How do you know which one is the correct genotype?

Answer: Perform a test cross.

A gardener will take a known homozygous recessive small pea plant (tt) and cross it with the “Mystery Plant”

\[
\text{TT} \times \text{tt} \\
\text{Tt} \times \text{tt}
\]

If the gardener gets offspring, half of which are short, you know that the parent genotype is Tt.

Interpreting Pedigrees

**PEDIGREE** is a graphic representation of genetic inheritance. It looks like a family tree.
Question: How do you know if a trait is **autosomal or sex-linked**?

Autosomal: Trait appears in both sexes equally.

Sex-linked: allele for a trait is located on the X-chromosome.

- How does this affect females?
- How does this affect males?