CONCEPT: POSITIONAL CLONING

● **Positional cloning** is an approach that identifies which candidate genes may be the one that causes the _____

1. Scientists use mapping techniques to identify a specific chromosomal region associated with a disease

    - This technique establishes linkage between DNA markers and disease phenotype

2. Additional markers are used within this locus to more precisely locate the gene of interest

3. **Chromosomal walking** uses overlapping DNA fragments to identify the gene of interest

    - Begin with clone A, which is closest to the marker

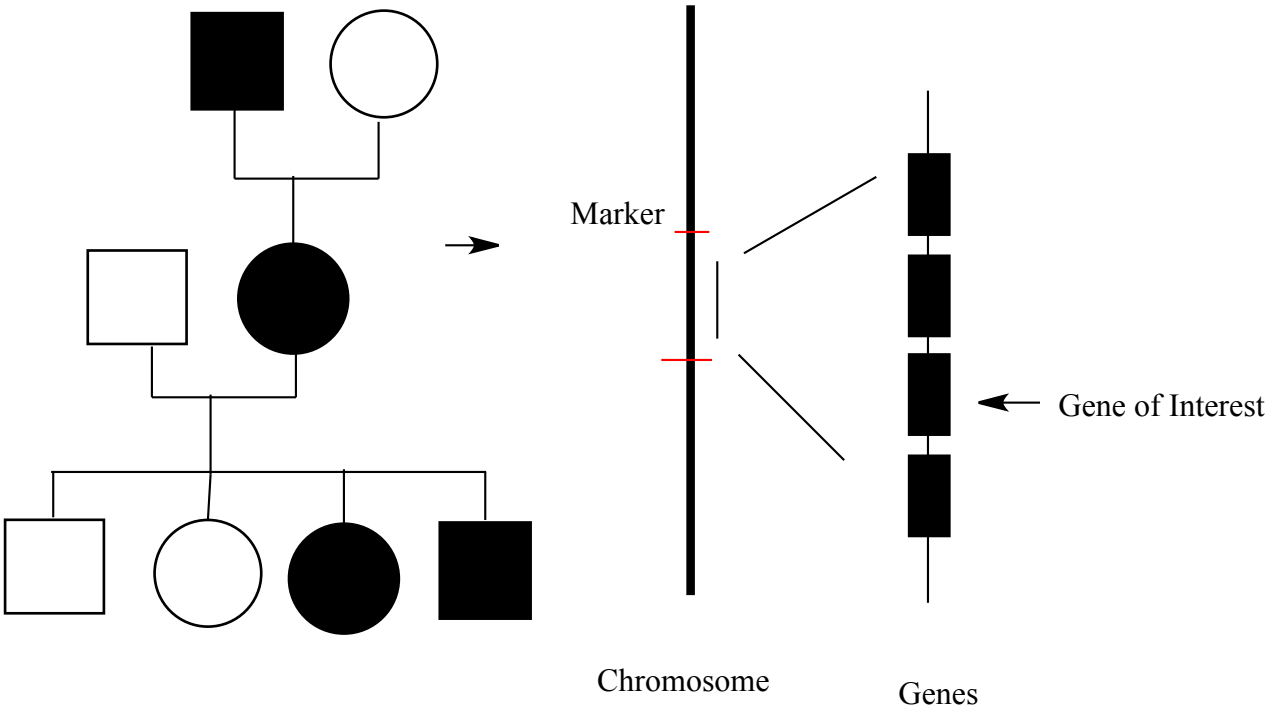
    - Identify an overlapping clone (called clone B) that walks closer to the gene

    - Repeat with as many overlapping clones as you need to walk to the gene, one clone at a time

4. Identify a small number of candidate genes within this region that could cause the disease phenotype

5. Examine each gene individually to determine which one actually causes the phenotype

EXAMPLE:



PRACTICE:

1. The purpose of positional cloning is to what?
    a. Identify a large section of chromosome that may be responsible for a phenotype
    b. Identify one or a few candidate genes that may be responsible for a phenotype
    c. Identify a RNA sequence that may be responsible for a phenotype
    d. Identify a protein that may be responsible for a phenotype

2. Which of the following is a crucial step of positional cloning?
    a. Sequencing the genome
    b. Chromosomal walking
    c. Identifying microsatellites
    d. Generating RFLPs