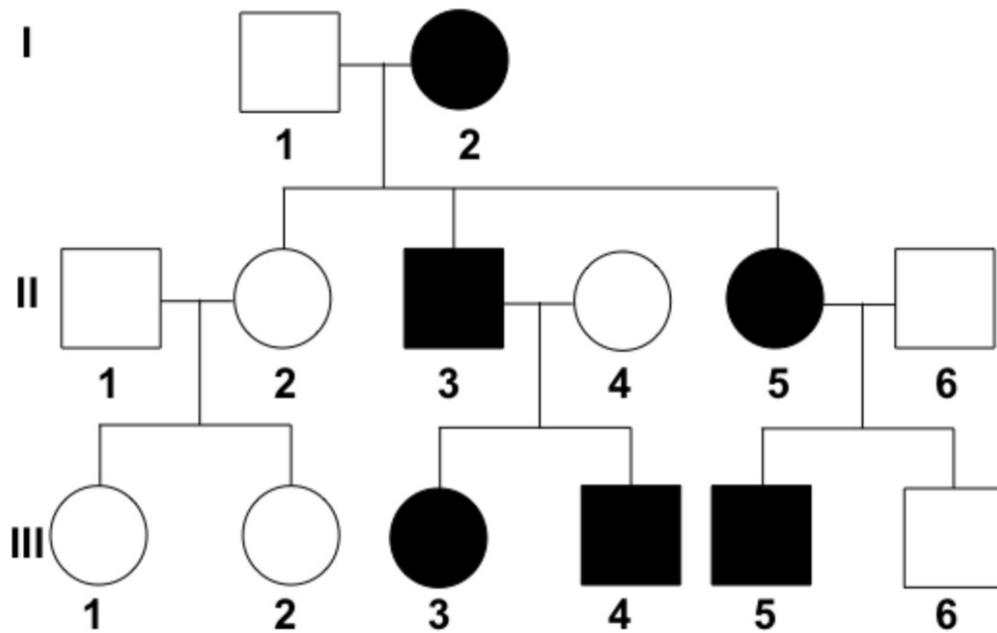


Indicate which of the following phenomena (A-H) is at work.

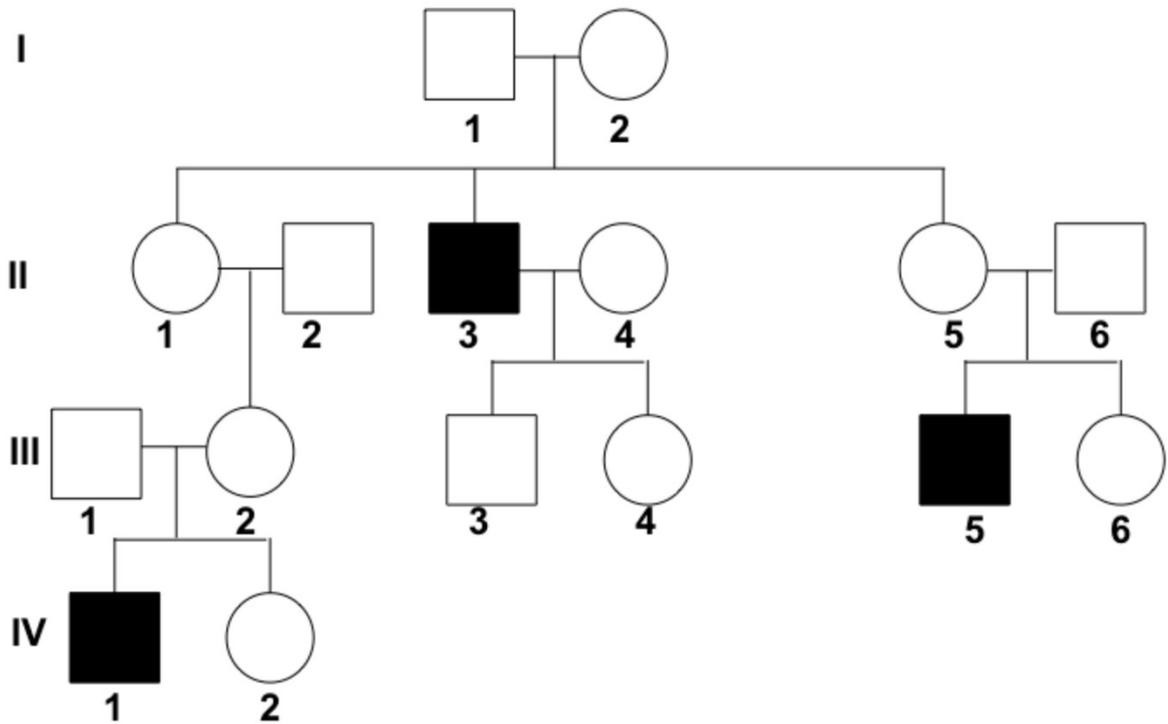
- ~~A. Lethal alleles~~
- B. Multiple alleles
- ~~C. Epistasis~~
- ~~D. Incomplete penetrance~~
- E. Variable expressivity
- ~~F. Pleiotropy~~
- ~~G. A phenocopy~~
- ~~H. Genetic heterogeneity~~
- ~~I. Codominance~~

- a. A woman with severe neurofibromatosis type 1 has brown spots on her skin and several large tumors beneath her skin. A genetic test shows that her son has the disease-causing autosomal dominant allele, but he has no symptoms. – **D. incomplete penetrance**
- b. A man and woman have six children. They also had two stillbirths - fetuses that stopped developing shortly before birth. – **A. Lethal alleles**
- c. Mutations in a gene that encodes a muscle protein called titin cause 22 percent of cases of inherited dilated cardiomyopathy, a form of heart disease. Other single genes cause the other cases. – **H. Genetic heterogeneity**
- d. A woman with dark brown skin uses a bleaching cream that darkens her finger tips and ears, making her look like she has the inherited disease alkaptonuria. – **G. A phenocopy**
- e. In labrador retrievers, the B allele confers black coat color and the b allele brown coat color. The E gene controls the expression of the B gene. If a dog inherits the E allele, the coat is golden no matter what the B genotype is. A dog of genotype ee expresses the B phenotype. – **C. Epistasis**
- f. Two parents are heterozygous for genes that cause albinism, but each gene specifies a different enzyme in the biochemical pathway for skin pigment synthesis. Their children thus do not face a 25 percent risk of having albinism. – **H. Genetic heterogeneity**
- g. Cystic fibrosis Transmembrane Conductance Regulator (CFTR) gene is expressed in many different tissues. – **F. Pleiotropy**
- h. An offspring of a chicken grows up to exhibit white and black feathers. The parents are black-feathered chicken and white-feathered chicken. – **I. Codominance**



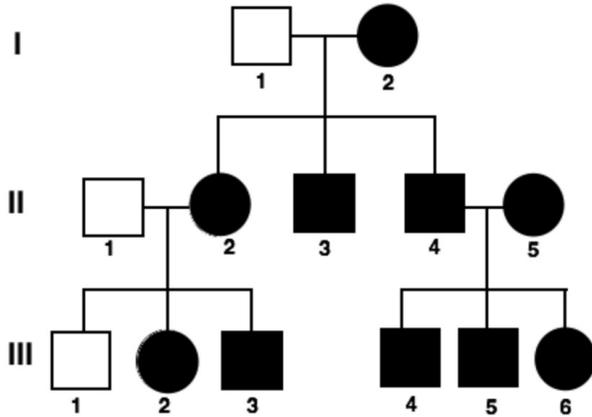
i.

1. Which inheritance patterns does the above pedigree show?
 - Autosomal dominant



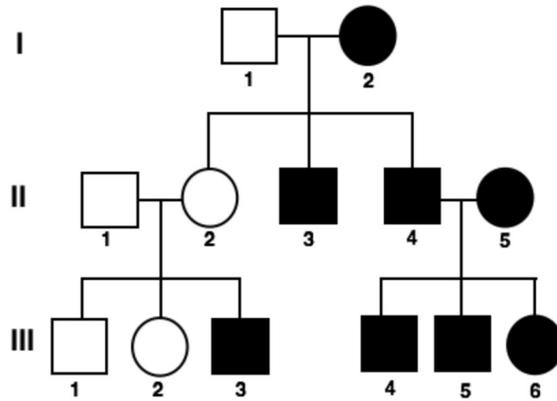
2. Which inheritance patterns does the above pedigree show?
 - Sex linked recessive

The pedigree below tracks the presence of dimples through a family's generation. Having dimples is an autosomal dominant trait.



3. Which of the following individuals is correctly matched with its genotype?
- A. II-3 → dd
 - B. II-2 → DD
 - C. III-2 → Dd**
 - D. I-1 → Dd

The pedigree below tracks Duchenne Muscular Dystrophy (DMD) through several generations. DMD is an X-linked recessive trait.



If individuals I-1 and I-2 had another son, what is the chance that he would have DMD?

4.

- a. 0%
- b. 25%
- c. 50%
- d. 100%**