**Dihybrid Cross Examples**

1. A man who is red-green colorblind and a carrier of cystic fibrosis marries a woman who is a carrier of red-green colorblindness and a carrier of cystic fibrosis.  
   A) Write the genotypes of the man and of the woman.  
   **Man: XrYFf Woman: XRXrFf**  
     
   B) What are the chances that their first child will be a red-green colorblind female who has cystic fibrosis? **1 in 16**  
     
   C) What are the chances that their first child will be a male who does not have red-green colorblindness and is a carrier of cystic fibrosis? **2 in 16, which simplifies to 1 in 8**  
   D) What are the chances that their first child will be a female who is a carrier of red-green colorblindness but is neither a carrier nor affected by cystic fibrosis? **1 in 16**

Yf

YF

Xrf

XrF

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| --- | --- | --- | --- |
| XRXrFF  XRF | XRXrFf | XRYFF | XRYFf |
| XRXrFf  XRf | XRXrff | XRYFf | XRYff |
| XrXrFF  XrF | XrXrFf | XrYFF | XrYFf |
| XrXrFf  Xrf | XrXrff | XrYFf | XrYff |

1. In pea plants, seeds may be either round or wrinkled; round seed shape is dominant. Seeds may be either yellow or green; yellow is dominant for seed color. A plant that is purebred for round, yellow seeds is crossed with a plant purebred for wrinkled, green seeds.  
   A) Write the genotypes of the two plants. Indicate which genotype represents which plant. **Round, Yellow Parent: RRYY Wrinkled, Green Parent: rryy**  
     
     
   B). Find the genotypic ratio of the F1 generation. **100% RrYy**  
     
   C) Find the phenotypic ratio of the F1 generation. **100% round, yellow seeds**  
     
   D) If the F1 generation self-fertilizes, find the genotypic ratio of the F2 generation.  
   1/16 RRYY 1/8 RRYy 1/16RRyy   
   1/8 RrYY ¼ RrYy 1/8 Rryy  
   1/16 rrYY 1/8 rrYy 1/16 rryy  
   E) Find the phenotypic ratio of the F2 generation.   
   9/16 round, yellow 3/16 round, green   
   3/16 wrinkled, yellow 1/16 wrinkled, green

ry

rY

Ry

RY

|  |  |  |  |
| --- | --- | --- | --- |
| RRYY  RY | RRYy | RrYY | RrYy |
| RRYy  Ry | RRyy | RrYy | Rryy |
| RrYY  rY | RrYy | rrYY | rrYy |
| RrYy  ry | Rryy | rrYy | rryy |