

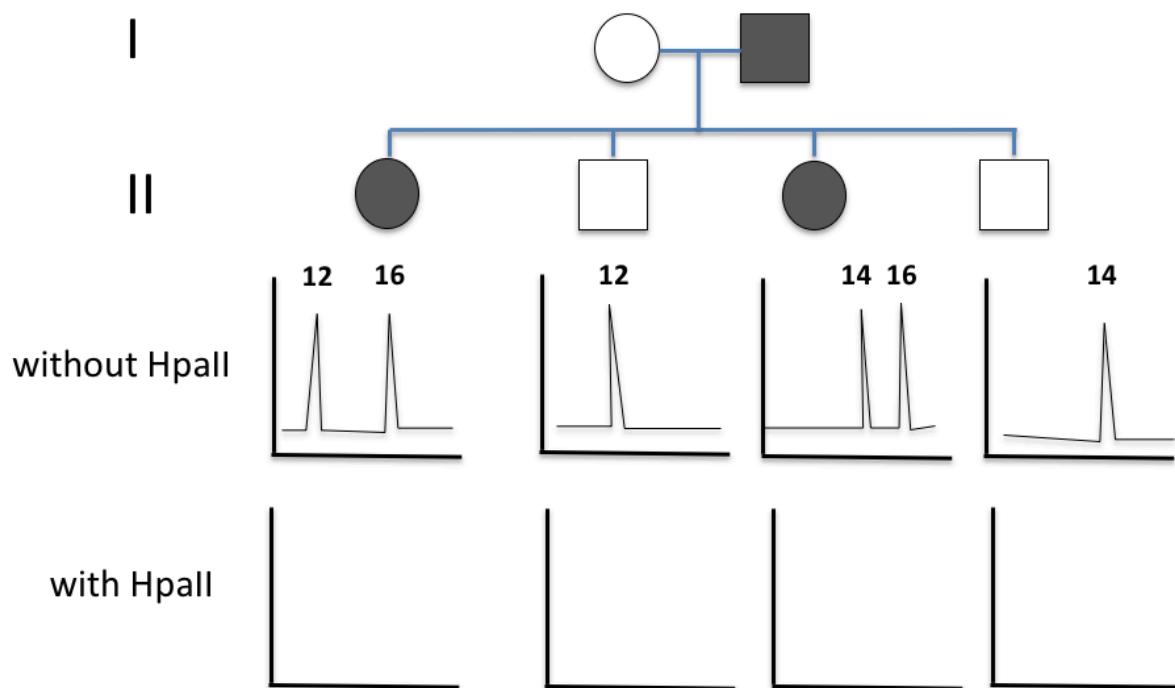
A couple has 2 daughters and 2 sons. The father is colorblind (does not distinguish green from red), the mother distinguishes green from red.

Their 2 sons distinguish red from green but their 2 daughters are colorblind!

According to textbooks, colorblindness is transmitted by the X chromosome:

- males are colorblind when their X chromosome is mutated
- carrier females (1 X chromosome mutated) are not colorblind;
- homozygote females (2 X chromosomes mutated) are colorblind.

The family presented here is exceptional.



The HUMARA assay has been done for all 4 children.
Results without digestion by HpaII are given.

Genotype of the mother: _____

Genotype of the father: _____

Is the mother carrier for colorblindness? YES NO

Draw the most likely results of the HUMARA assay with digestion by HpaII before the PCR.
Explain your reasoning.