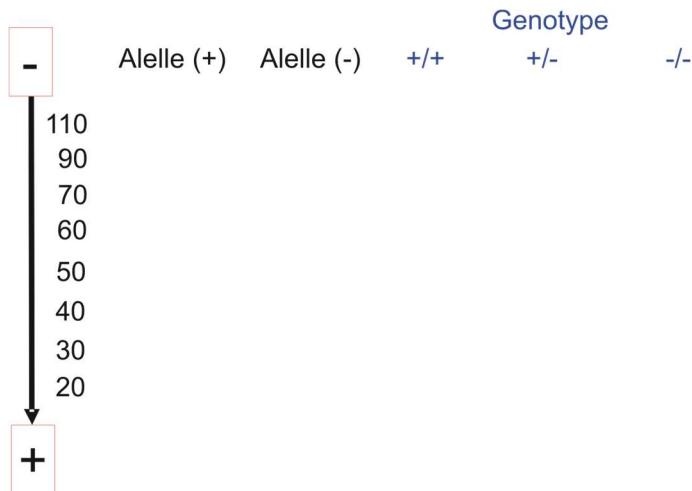
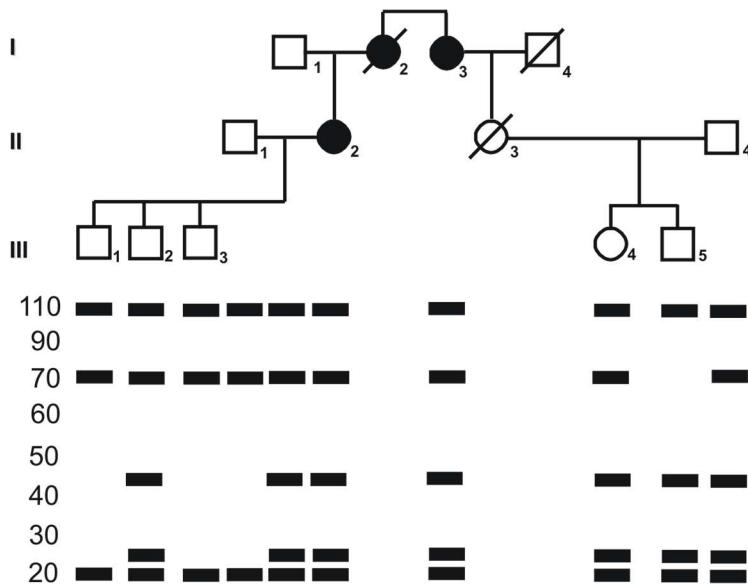




1. Task 2 p. 125 – von Hippel-Lindau disease – refer to the textbook for detailed description.
- a. According to the design of PCR and restriction digestion, draw the expected electrophoretic gel pattern of the allele (+), allele (-) and of all possible genotypes. How can you recognize that the PCR product is digested incompletely?



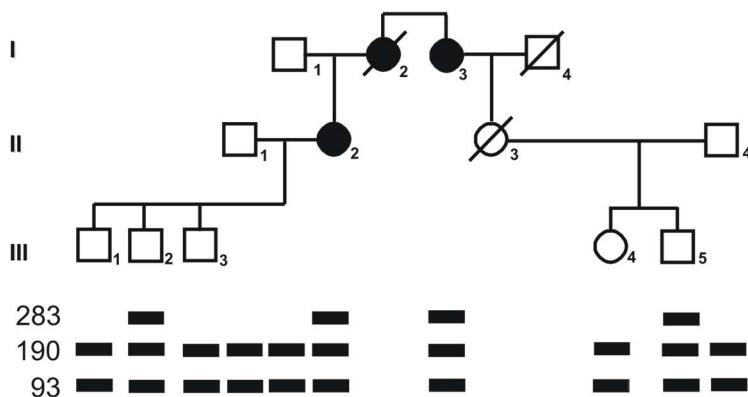
- b. Determine, based on examination of the HaeIII polymorphism, who in the third generation will be a carrier of the mutant allele.



- c. Reexamine the result, if it was found, using a paraffin-embedded tissue block from previous appendectomy, that the genotype of I/2 was (+/+)?

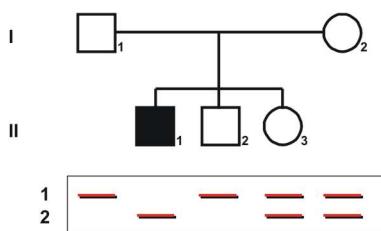


- d. Determine the carriers of the mutated allele in the third generation using direct detection of the previously identified familial mutation c.712C>T (p.Arg238Trp), the mutation causes loss of an Mspl restriction site:

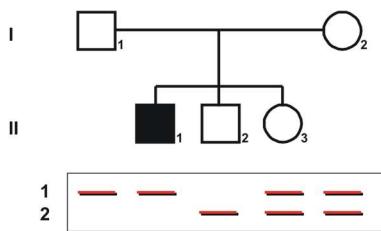


2. Indirect DNA diagnostics using restriction analysis in a family with an X-linked (gonosomal) recessive disease (Task 3+4, p. 121)

3. Is daughter II/3 heterozygote for the mutant allele causing the X-linked disorder?
(complete linkage)



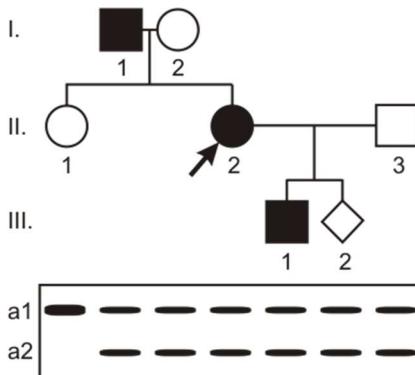
4. Is daughter II/3 heterozygote for the mutant allele causing the X-linked disorder?
(complete linkage)



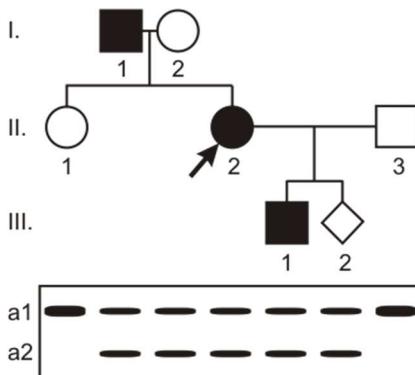


3. Indirect DNA diagnostics using restriction analysis method of an autosomal dominant disorder.

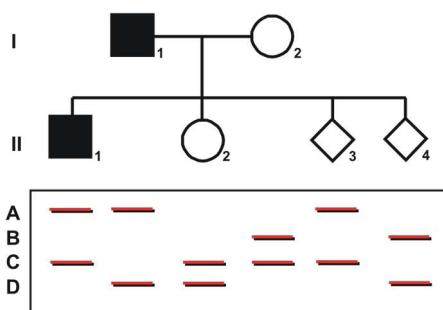
a. Will be the fetus III/2 affected by the AD disorder which occurs in the family?



b. Will be the fetus III/2 affected by the AD disorder which occurs in the family?



4. Task 5, p. 122 – Indirect DNA diagnostics in polycystic kidney disease (PKD) – for details refer to the textbook, keep in mind that the distance of the polymorphism and the PKD gene is 5cM.



a. What is the prognosis (risk of PKD) based on pedigree analysis only?

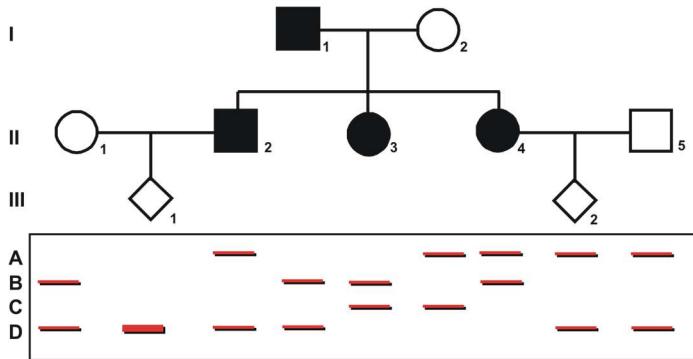
for II/3 for II/4

b. What is the prognosis (risk of PKD) based on the DNA testing?

for II/3 for II/4



5. Task 6, p. 123 – Indirect DNA diagnostics in polycystic kidney disease (PKD) – for details refer to the textbook, the same polymorphism as in the previous task (distance 5 cM), the family is different.



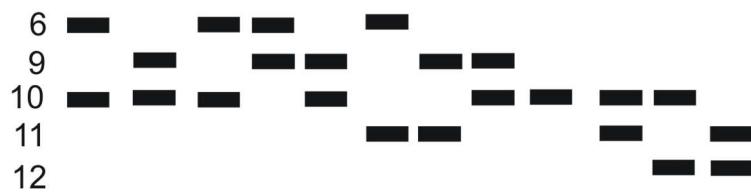
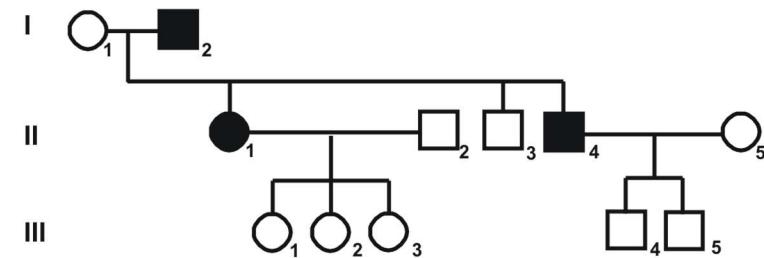
a. What is the prognosis (risk of PKD) based on pedigree analysis only?

for III/1 for III/2

b. What is the prognosis (risk of PKD) based on the DNA testing?

for III/1 for III/2

6. Task 4, p. 130 – indirect DNA diagnostics of familial adenomatous polyposis (FAP). The polymorphism is in close vicinity of the gene, linkage is complete. For details, refer to the textbook.



a. Which members of the third generation are carrying the mutant allele (and therefore at risk of developing FAP)?

b. What can we do if there is a noninformative result for some individuals?