

Algorithms in Genome Research
Winter 2021/2022

Exercises

Number 10, Discussion: 2022 January 28

- Investigate: What is the difference between linkage and association?
- Let the following haplotype matrix be given (circles represent the presence of a mutant allele):

	1	2	3	4	5	6	7	8	9	10
A	—O—	————	—O—	O—	O—	O—	————	—O—	O—	—
B	————	————	O—	————	————	————	O—	————	————	————
C	—O—	O—	————	————	O—	O—	————	O—	O—	O—
D	————	————	O—	————	————	————	————	O—	————	————
E	—O—	O—	————	————	————	O—	————	————	O—	————
F	————	————	————	O—	————	————	O—	————	O—	————

- Find the maximal regions around each segregating site, not violating the four-gametes test.
 - Draw the local trees for these regions.
 - Assume that individuals *C* and *E* are the cases, the other the controls. Which of the segregating sites show highest evidence for association with the disease?
- Discuss: Can pedigree (family) information help in the analysis of whole-genome association studies?