

Algorithms in Genome Research  
Winter 2017/2018

Exercises

Number 05, Discussion: 2017 November 24

1. What is the difference between linkage and association?
2. 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—
B	————	————	O—	————	————	————	O—	————	————	————
C	—O—	O—	————	————	O—	O—	————	O—	O—	O—
D	————	————	O—	————	————	————	————	O—	————	————
E	—O—	O—	————	————	————	O—	————	————	O—	————
F	————	————	————	O—	————	————	O—	————	O—	————

- (a) Find the maximal regions around each segregating site, not violating the four-gametes test.
  - (b) Draw the local trees of the segregating sites.
  - (c) 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?
3. Discuss: Can pedigree (family) information help in the analysis of whole-genome association studies?