Using survival data in gene mapping : using survival data in genetic linkage and family-based association analysis

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Stellingen

1. The NPL statistics for survival data developed in chapters 2, 3, 4 and 5 of this thesis are regression methods where the identical-by-descent (IBD) information is regressed on functions of age at onset traits.
This thesis, chapters 2-5

2. Standard methods for linkage analysis ignore the phenotypes of the parents when they are not genotyped. However, this information is useful for gene mapping.
This thesis, chapter 3

3. For pedigrees of large or moderate size the quasi-likelihood log-normal frailty model is more powerful than the pairwise-likelihood gamma frailty model.
This thesis, chapter 4

4. Weighting the IBD according to the family history increases the expected power to detect linkage for common complex diseases.
This thesis, chapter 6

5. An analysis of microarray data taking into account the physical location of genes is promising in detecting chromosomal regions with transcriptional imbalances (such as translocations, deletions and duplications) often characterizing cancer.
Callegaro et al. (2006). Biometrics, 22(21): 2658-66.

6. A Cox model where the first principal component of the microarray data is analyzed together with other prognostic factors is a simple method to assess if transcriptional patterns are associated with survival time also in the presence of other prognostic factors.
Mandruzzato et al. (2006). Journal of Translational Medicine, 4(1): 50.

7. When samples are exchangeable under the null hypothesis, permutation tests are useful because they are simple to implement and require no asymptotic distribution theory.

8. A multivariate permutation test for survival data which is powerful under nonproportional hazards alternatives is obtained by splitting the follow-up time into different intervals.
Callegaro et al. (2003). Italian Journal of Applied Statistics, 15: 241-261

9. Humanity takes itself too seriously. It is the world's original sin. If the cave-man had known how to laugh, history would have been different.
Oscar Wilde, The Picture of Dorian Gray, Chapter 3

Andrea Callegaro, 14 may 2010