

## **Semi-parametric testing for gene-gene or gene-environment interactions**

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Developments in genetic epidemiology have stimulated a large interest in tests for gene-gene or gene-environment interaction. Traditional approaches are based on standard regression models which involve including the product of both genes, or gene and environment. I will argue that this is not entirely satisfactory for various reasons, in view of which I will opt for a semi-parametric approach. The first part of the talk will focus on the analysis of random samples. I will discuss estimation in a novel class of semi-parametric interaction models which only specify the interaction between the exposures (genes and/or environment) of interest, but not their main effects. In family-based genetic studies in which the joint marker distribution is known by Mendelian inheritance, the proposed procedure will lead to asymptotically distribution-free tests of the null hypothesis of no gene-gene interaction. The second part of the talk will extend the results to the analysis of complex traits in family-based studies in which a phenotypic ascertainment criterion has been imposed. I will apply the approach to a study of chronic obstructive pulmonary disorder.

### References:

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