SOME ISSUES ASSOCIATED WITH TESTING FOR GENE DIFFERENTIAL EXPRESSION

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An important and common problem in microarray experiments is the detection of genes that are differentially expressed in a given number of classes or conditions. We consider this problem which involves selecting significant genes from a large pool of candidate genes. Given the usual size of this pool of genes, this selection problem needs to be carried out within the framework of multiple hypothesis testing. In this framework, we examine some of the issues that arise, including the formation of a suitable test statistic, the estimation of P-values via permutation tests, and the effect of correlation between the genes on inferences drawn under the assumption of independence. The results are illustrated on some well-known publicly available data sets.