生物信息学

cDNA芯片差异表达基因检测的非转换方法

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摘要 cDNA微阵列数据中包含许多变异因素，用于检测差异表达基因和其它统计分析前，必须将这些"噪音"删除。对数比法（背景校正、对数比转换和数据标准化）已经被广泛应用用于cDNA微阵列列数据分析中，然而这种方法却存在着一些亟待解决的缺陷。对此，提出一种非转换方法，它可免去对数比的转化过程，直接在背景校正后进行数据标准化，可以有效删除实验"噪音"。研究结果表明，在检测差异表达基因的效率方面，非转换方法比常规的对数比法具有更好的稳健性和更高的的检测功效，基因检出率和准确性大大提高。

关键词 cDNA芯片；差异表达基因；对数比转换；非转换方法；标准化

分类号

A Non-transformation Method for Identifying Differentially Expressed Genes from cDNA Microarrays

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Abstract

cDNA microarray data are subject to many sources of variation that have to be removed before statistical tests can be applied for identifying genes that are expressed differentially. Background correction, log-ratio transformation, and normalization, referred as the log-ratio approach, have been widely used for this purpose. However, there are some problems associated with this procedure. In this study, we proposed an alternative approach that obviates the log-ratio transformation step and goes directly to normalization after background correction. The method can estimate the "noise" effect by utilizing the information more effectively. Simulation studies were carried out to compare the feasibility and efficiency of this approach for detecting the specifically and differentially expressed genes under various conditions with the log-ratio approach. The results showed that our approach worked well and was more robust and powerful than the log-ratio approach.

Key words cDNA microarray；differentially expressed gene；log-ratio；non-transformation；normalization

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