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Coauthors: Stan Pounds, Ph.D.

**ADAPTIVE SIGNIFICANCE THRESHOLD COMPLEMENTARY
TO THE CONTROL OF FALSE DISCOVERY RATE**

CHENG CHENG, PH.D.

The control of False Discovery Rate (FDR) is now a widely accepted approach to determine a significance threshold (P value cut off) for large-scale multiple tests. Although control of the level of false positive errors is important, in exploratory studies such as genome-wide surveys using gene expression or SNP marker microarrays, the level of false negative errors is of equal concern because the subsequent bioinformatics and laboratory investigations of the findings can further guard against false positives. Moreover, the level at which to control the FDR has to be determined subjectively, and it is not always clear in an application what the proper FDR level is. Thus some statistical guideline can be beneficial. This research addresses the balance between the levels of the two types of errors by developing two significance threshold criteria alternative to FDR control – the profile information criterion and the total-error criterion. Minimization of these criteria provides adaptive significance thresholds taking the levels of the two types of errors into consideration. Some analytical properties, operating characteristics, advantages and drawbacks of the proposed methodology will be presented.

ST. JUDE CHILDREN'S RESEARCH HOSPITAL
E-mail address: cheng.cheng@stjude.org