The University of Mississippi
Department of Mathematics

Statistics Seminar

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Evaluate Agreement of Differential Expression for Translational Cross-Species Genomics

2:00 pm, Friday, November 11, 2011
Hume Hall 331

Abstract: An important problem in translational genomics is to evaluate the fidelity of an animal model of a human disease. We developed the agreement of differential expression (AGDEX) procedure to evaluate the agreement of the results of a differential expression experiment using mouse with those of a similar experiment using humans. AGDEX uses an agreement statistic to measure the similarity of expression differences for pre-defined sets of ortholog-matched genes. Significance is determined by permutation. In two pediatric cancer genomics studies, AGDEX was used to determine that a brain tumor in a mouse model showed a similar gene expression profile to that of a specific human brain tumor subtype. In both studies, these results were confirmed by subsequent laboratory investigation which revealed that the model tumor shows remarkable histological similarities to the identified human tumor. The combined results lead to the identification of the cell of origin for two different types of brain tumors. These examples provide compelling proof-of-principle that AGDEX can be a useful tool for biological discovery. A free Bioconductor package AGDEX we developed will be introduced also.

Faculty, staff and students are welcome to attend