Robert J. Lipshutz, Ph.D.

Affymetrix
3380 Central Expressway
Santa Clara, California 95051
USA

Dr. Lipshutz received his Ph.D. from U.C. Berkeley, and his M.A. and A.B. from Harvard University, all in mathematics. Presently, he is Vice President of Corporate Development at Affymetrix, a biotechnology company developing DNA chip-based research products for the genomics and clinical diagnostic markets. Prior to this position he was Director of bioinformatics and advanced technology. The genome informatics group is responsible for DNA chip design, data analysis, instrumentation software and software product development. The advanced technology group is developing miniaturized integrated nucleic acid analysis devices under an ATP grant. His research at Affymetrix involved combinatorics, computer science, probability, statistics and computer modeling.

Genes, chips and genomes

The Human Genome Project is providing life science researchers with access to unprecedented amounts of raw sequence data. To effectively harness this data and apply it to biomedical research, therapeutic development, clinical practice and patient management, powerful new tools for measuring gene expression, polymorphism discovery and genotyping are needed. GeneChip probe arrays are powerful tools to meet these requirements. Light-directed chemical synthesis is used to generate miniaturized, high-density arrays of oligonucleotide probes called GeneChip probe arrays. Application-specific oligonucleotide arrays have been used to rapidly scan known genes and discover genetic variants, to detect the presence of known alternative alleles and to simultaneously measure the expression of thousands of individual genes. An integrated GeneChip system including instrumentation and software has been developed for array hybridization, fluorescent detection, and data acquisition and analysis. Experiments demonstrating the effectiveness of these methods of genetic analysis will be decribed.