

Statistics for Biology and Health

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The Analysis of Gene Expression Data: Methods and Software

This book presents practical approaches for the analysis of data from gene expression microarrays. Each chapter describes the conceptual and methodological underpinning for a statistical tool and its implementation in software. Methods cover all aspects of statistical analysis of microarrays, from annotation and filtering to clustering and classification. Chapters are written by the developers of the software. All software packages described are free to academic users. The book includes coverage of various packages that are part of the Bioconductor Project and several related R tools.

The materials presented cover a range of software tools designed for varied audiences. Some chapters describe simple menu-driven software in a user-friendly fashion and are designed to be accessible to microarray data analysts without formal quantitative training. Most chapters are directed at microarray data analysts with master's-level training in computer science, biostatistics, or bioinformatics. A minority of more advanced chapters are intended for doctoral students and researchers.

The team of editors from the Johns Hopkins Schools of Medicine and Public Health has been involved with developing methods and software for microarray data analysis since the inception of this technology. Giovanni Parmigiani is Associate Professor of Oncology, Pathology, and Biostatistics. He is the author of the book *Modeling in Medical Decision Making*, a fellow of the ASA, and recipient of the Savage Awards for Bayesian Statistics. Elizabeth S. Garrett is Assistant Professor of Oncology and Biostatistics and recipient of the Abbey Award for Statistical Education. Rafael A. Irizarry is Assistant Professor of Biostatistics and recipient of the Noether Award for Non-Parametric Statistics. Scott L. Zeger is Professor and Chair of the Biostatistics Department. He is coauthor of the book *Longitudinal Data Analysis*, a fellow of the ASA, and recipient of the Spiegelman Award for Public Health Statistics.

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