



DNA Methylation Microarrays: Experimental Design and Statistical Analysis (Chapman & Hall/CRC Biostatistics Series)

By Sun-Chong Wang, Art Petronis

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Providing an interface between dry-bench bioinformaticians and wet-lab biologists, **DNA Methylation Microarrays: *Experimental Design and Statistical Analysis*** presents the statistical methods and tools to analyze high-throughput epigenomic data, in particular, DNA methylation microarray data. Since these microarrays share the same underlying principles as gene expression microarrays, many of the analyses in the text also apply to microarray-based gene expression and histone modification (ChIP-on-chip) studies.

After introducing basic statistics, the book describes wet-bench technologies that produce the data for analysis and explains how to preprocess the data to remove systematic artifacts resulting from measurement imperfections. It then explores differential methylation and genomic tiling arrays. Focusing on exploratory data analysis, the next several chapters show how cluster and network analyses can link the functions and roles of unannotated DNA elements with known ones. The book concludes by surveying the open source software (R and Bioconductor), public databases, and other online resources available for microarray research.

Requiring only limited knowledge of statistics and programming, this book helps readers gain a solid understanding of the methodological foundations of DNA microarray analysis.

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Editorial Review

Review

I found the book to be very informative and a timely introduction to the issues related to designing and analyzing array-based methylation experiments. ... it provides a solid grounding and serves as a good reference book for any statistician venturing into this field.

?Sarah Bujac, *Pharmaceutical Statistics*, 2011, 10

...a useful presentation of four detailed, well-written parts concerning techniques in the analysis of high throughput epigenomic data ... a consistent and self-contained overview on important fundamental and modern procedures used by researchers in biology, bioinformatics, experimental designs ... The book is of great interest to research workers who use the above-mentioned procedures in experimental design and deep analysis of epigenomic data with sound statistics.

?Cryssoula Ganatsiou, *Zentralblatt MATH* 1172

... This book is a helpful guide for researchers and students with an interest in performing genomic studies using high-throughput microarrays. ... A wide range of useful data analysis tools are covered ... Other strengths throughout the book include the discussion of experimental design, the mention of software for certain analyses, and the inclusion of more advanced methods such as wavelets and genetic algorithms. ... Overall, this book gives a nice summary of methods used for the analysis of hybridization-based microarray data. ...

?*Biometrics*, March 2009

Users Review

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Bertha Chang:

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happy read one having theme for entertaining including comic or novel. The DNA Methylation Microarrays: Experimental Design and Statistical Analysis (Chapman & Hall/CRC Biostatistics Series) is kind of guide which is giving the reader erratic experience.

Roberto Garcia:

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