

Schena, M.

Microarray Analysis

Wiley-Liss, a John Wiley & Sons, Hoboken: New Jersey/Chichester: West Sussex, 2003. XIV + 630 pages.
Format 215 × 280 mm. Hardback. Price Lstg 55.95. ISBN 0-471-41443-3

Mark Schena, Ph.D., "The Father of Microarray Technology" published his first paper on microarrays in 1995, and has given more than 80 lectures in 15 countries since 1995. As stated, among other things, in the preface by the author, the work on microarrays started at a time, where there was no evidence that biological experiments could be performed on glass chips. It was made at a time when it was outlined that a basic experimental approach could come to be known as microarrays analysis. Improved hybridization specificity was obtained using complementary DNA microarrays. Printed microarrays were also employed for the first human microarray analysis experiments. The first human microarray data were presented in 1995. The creation of *Microarray analysis* was motivated by explosive proliferation of the technology, the highly technical nature of the field, and the flood of requests from young scientists for a foundational compendium.

The volume is composed of 16 chapters. Each chapter is concluded by a summary, selected reading and review questions. Margins of many pages contain basic and/or specialized definitions of relevant terms. Chapter 1 provides introduction to general principles of microarray analysis. Chapters 2 and 3 constitute a highlight to introduction to chemistry and basics to biochemistry. Chapter 4 is concerned with cloned DNA and its replication, sequencing, gene expression and genome structure. In chapter 5 optimal microarray surfaces are to be examined. Chapter 6 offers an analysis of targets and probes necessary for a correct microarray procedure. Chapters 7 through 9 provide an overview of basic manufacturing requirements and explain, how each manufacturing method works. Next chapter covers all of the main topics in modern microarray detection technology, including the evaluating criteria, signal and noise, electromagnetic evaluation, fluorescence, optical lasers and detectors, and scanning and imaging architectures. In the subsequent text about microarray

informatics computers play a central role in virtually every aspect of microarray research.

Chapter 10 contains a sophisticated methodological architecture required for successful microarray experimentation. Chapter 11 reviews cleanroom technology that reduces the levels of contamination in the ambient environment and increases the consistency and quality of all processes related to microarray manufacture and use. In chapters 12 and 13 gene expression and profiling reveals much about biological processes and microarrays provide an accurate technology for examining DNA sequences. Novel microarray technologies (chapter 14) are giving rise to a steady flow of novel formats and in analysis. Chapter 15 has created interesting commercial opportunities, detection equipment, genetic screening services, software tools, and many more. In concluding chapter 16 future trends: chips in the clinics are pointed out. The use of microarray technology in a clinical setting holds the promise of providing detailed molecular information to the physician, enabling more informed decision making and better health care. Finally, 9 appendices bring overviews and summaries of explanations of unit and technical abbreviations, conversions, nucleic acid molecular weight calculations, and other microarray calculations.

DNA microarray presents a new analytic method of proteins, nucleic acids, genes and other biological molecules in a genomic scale. The development of DNA chips is designated as a second revolutionary research in the region of molecular basis of infectious and other diseases – besides the project of human genome. This method replaces the traditional procedures with gels, filters and columns. Present publication builds a conceptual foundation for the entire field.

Jindřich Jirá