

Contents

List of contributors	IX
Preface	XIII
Colour Plates	XV
1 Molecular building principles in nature <i>J. Michael Koehler and Hans Peter Saluz</i>	1
2 Robotic equipment and microsystem technology in biological research <i>Holger Eickhoff, Igor Ivanov, Markus Kietzmann, Elmar Maier, Markus Kalkum, David Bancroft and Hans Lehrach</i>	17
3 Components and systems for microliquid handling <i>Steffen Howitz</i>	31
4 Nanotiterplates for screening and synthesis <i>Günther Mayer, Klaus Wohlfart, Andreas Schober and J. Michael Köhler</i>	75
5 Chip technology for micro-separation <i>Andrew J. de Mello and Andreas Manz</i>	129
6 Rapid multisample PCR in miniaturized ultrathin-walled microwell plates <i>Alexander N. Tretyakov, Rimma A. Pantina, Oleg K. Kaboev and Hans Peter Saluz</i>	179

7	Generation of large libraries <i>Carola Burgtorf and Hans Lehrach</i>	189
8	Generation and screening of solution-phase synthetic peptide combinatorial libraries <i>Andrew Wallace, Kenneth S. Koblan, Riccardo Cortese, Jackson B. Gibbs and Antonello Pessi</i>	225
9	Using oligonucleotide probe arrays to access genetic diversity <i>R.J. Lipshutz, D. Morris, M. Chee, E. Hubbell, M.J. Kozal, N. Shah, N. Shen, R. Yang and S.P.A. Fodor</i>	241
10	Generation of libraries by print technologies <i>Eugen Ermantraut, Stefan Wölfl and Hans Peter Saluz</i>	255
11	Synthesis and screening of bead-based libraries <i>Dirk Vetter</i>	265
12	Sensors for biomolecular studies <i>Jan Rickert, Thomas Wessa and Wolfgang Göpel</i>	279
13	Fluorescence detection of single molecules applicable to small volume assays <i>Jörg Enderlein, W. Patrick Ambrose, Peter M. Goodwin and Richard A. Keller</i>	311
14	Fluorescence correlation spectrometry (FCS): Measuring biological interactions in microstructures <i>Gabriele Gradl, Rolf Guenther and Silvia Sterrer</i>	331
15	Scanning force microscopy: A microstructured device for imaging, probing, and manipulation of biomolecules at the nanometer scale <i>Wolfgang Fritzsche</i>	353
16	DNA resequencing, mutation detection and gene expression analysis of oligonucleotide microchips <i>Andres Metspalu and John M. Shumaker</i>	371

17	Miniaturized arrays for DNA analysis <i>Maryanne J. O'Donnell and Hubert Köster</i>	399
18	Manipulation of particles, cells and liquid droplets by high frequency electric fields <i>Thomas Schnelle, Torsten Müller and Günter Fuhr</i>	417
19	Optical trapping and manipulation <i>Karl Otto Greulich</i>	453
20	Computer modeling of protein, nucleic acid, and drug structures <i>Jürgen Sühnel</i>	475
21	Optimizing structure and function relationship of nucleic acid molecules <i>Michael Famulok, Andres Jäschke and Stefan Wölfl</i>	507
22	Optimisation of molecular function <i>Christian V. Forst</i>	529
23	Appendix <i>Udo Luhmann</i>	555
	Index	575