
BOOK REVIEW

Analytical Biotechnology

(Thomas, G. M., and Schalkhammer, T., eds., Birkhauser, Basel-Boston-Berlin,
2002, 344 p., € 125.23, hardcover, € 83.18, softcover)

This book written by an international team of authors continues a series of monographs describing the newest methods and tools in bioscience and medicine. This methods series includes detailed information from basic theory to sources of equipment and reagents. It covers background information, detailed step-by-step protocols, typical data, hints and tips for success, troubleshooting guides, and key literature references.

In the first chapter, F. Pittner depicts a big set of immobilization procedures by covalently coupling (including coupling to inorganic supports) for different biomolecules via reactive residues and tests for assaying functional groups.

The second chapter, written by C. Mayer and T. Schalkhammer, is devoted to a wide range of fluorescence techniques from fluorescence spectra measurements, photobleaching and ratiometric measurements to modern fluorescence correlation spectroscopy, confocal fluorescence spectroscopy, and real time polymerase chain reaction.

The next chapter (by F. Gabor, O. Hoffman, F. Pittner, and M. Wirth) considers immunoanalytical methods with design of an immunoassay and practical quantification examples by ELISA. Also, in this chapter much attention is given to immunofluorescence analysis by flow cytometry and confocal laser scanning microscopy.

In chapter 4, R. Verheijen describes fast single-use lateral flow immunoassays using immunological strip tests.

Most of chapter 5 (Biosensors) written by T. Schalkhammer considers various measurement modes using electrode-based biosensors. Furthermore, this chapter describes biosensors that are based on the piezoelectric effect and various optical devices: fluorescence sensors, fiber-optic biosensors, and sensors using surface plasmon resonance.

In chapter 6, N. Stich describes techniques for work with DNA and RNA biochips as well as protein-function and protein-detection arrays.

The next chapter (by G. Bauer, N. Stich, and T. Schalkhammer) considers preparation and use of nanoclusters and colloids in bioanalysis. Unique properties of these particles make possible new detection methods such as surface-enhance Raman scattering (SERS), surface enhanced absorption (SEA), and surface enhanced fluorescence (SEF).

Chapter 8 (by Y. Alguel and T. Schalkhammer) is devoted to atomic force microscopy (AFM), which is an efficient technique for imaging surfaces with a resolution down to an atom size scale. AFM also makes it possible to perform force measurements between two molecules with nano- and pico-Newton resolution.

The last chapter (by R. Palkovits, C. Mayer, and T. Schalkhammer) considers the important biotechnological problem of analysis and control of composition in the cultural media for bacterial and mammalian cells.

The book can be recommended as a working manual for scientists, researchers, doctors, and students in academic, industrial, and medical laboratories.

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