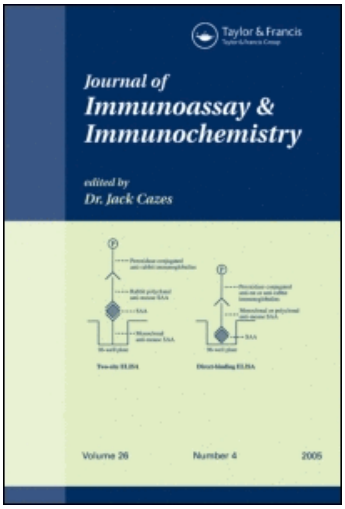


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# The Book Corner

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# The Book Corner

**Industrial Proteomics, Applications for Biotechnology and Pharmaceuticals**, Edited by Daniel Figeys, John Wiley & Sons, Inc., Hoboken, NJ, 2005, 303 pages. Price: $79.95 (Paperback).



*Industrial Proteomics, Applications for Biotechnology and Pharmaceuticals* is as the editor states "is a focused treatment of industrial applications of proteomics. Proteomics in industry is generally focused on application in target discovery and pharmaceutical pipelines, thereby requiring proteomic processes that are robust, well characterized, under quality control (QC) and producing statistically significant results. It also requires the capacity to handle significant amounts of samples. For example, a simple clinical proteomic study might require an analysis by expression proteomics from a minimum of 36 to hundreds of complex samples."

This book contains 11 chapters, each of which addresses specific aspects of industrial application of proteomics. The first chapter covers the basics of mass spectrometry (MS)-based proteomics. Functional proteomics is covered in Chapters 2 and 3. Chapter 2 discusses the MS-based approaches of mapping protein interactions. Chapter 3 discusses the protein posttranslational modifications, particularly, protein phosphorylations. Structural proteomics is covered in Chapters 4 and 5. Chapter 4 covers the use of high-throughput crystallography and in silico methods for structure-based drug design. Chapter 5 describes the use of hydrogen/deuterium exchange mass spectrometry for high-throughput protein structure studies.

The first applications of proteomics were in target discovery. Chapter 6, a discussion of the utilization of proteomics technologies for the identification as well as the validation of protein targets is given.

The latest application of proteomics has been for the discovery of disease or drug-related biomarkers. Chapter 7 provides an overview of biomarker discovery and validation while Chapter 8 details plasma biomarker discovery using proteomics.

Proteomics can also be approached from the small-molecule worked (i.e., drugs), particularly, to find proteins that interact with drugs. Chapter 9 presents chemical genomics/chemical proteomics and discusses the different approaches.

Chapter 10 presents a protein friendly bioinformatic approach and important factors to consider when developing such an approach. Chapter 11 addresses the promising field of protein arrays, by introducing the different approaches and discussing the challenges and success.

The book lacks in detailing the analytical strategies for effective proteome characterization. We found at least one typographical error on page 55, Conrods should read Conrads. Also, some of the figures, for example, page 195, the figure legend are fuzzy as well as in other pages of the book. It seems that some authors were more elegant than others in how they represent their reviews. In spite of the above comments the book will be of help for those interested in the industrial applications of proteomics.

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**Proteomics Today, Protein Assessment and Biomarkers Using Mass Spectrometry, 2D Electrophoresis, and Microarray Technology**, by Mahmoud Hamdan and Pier Giorgio Righetti, John Wiley & Sons, Inc., Hoboken, NJ, 2005, 426 pages. Price: $89.95.

*Proteomics Today* is a well-written book with a wealth of useful information for all those interested in proteomic analysis. The book is written,

not edited, by two prominent scientists. The book's focus is on mass spectrometry (Part I, Chapter 1), a central component of proteomic research. In this chapter Dr. Hamdan presents a wealth of information dealing with all aspects of mass spectrometry (MS) such as electrospray ionization, ion detection, types of analyzers, tandem MS, FT-ICR-MS and other topics of great interest. Chapter 2 deals with proteomics in cancer research. Here the authors discuss such topics as 2D-gel electrophoresis, surface enhanced laser desorption ionization, protein arrays, laser capture microdissection, analyses of different types of cancer, and proteomic profiling.

In Chapter 3 the authors discuss in detail current strategies for protein quantification, a very important and timely topic. The second part entitles Proteomics Today: Separation Science at Work is made up of three chapters totaling more than 225 pages or 60% of the book. Such a rational is absolutely justified since separation is an integral part and an important one of proteomic research, especially at the global level. Professor Righetti is well qualified to discuss protein separations. His discussion on separations deals mainly with isoelectric focusing, SDS-PAGE and two-dimensional maps. The discussion of these topics is well presented and referenced. I would have liked to see more discussion of liquid phase based separations such as ion exchange, size exclusion, affinity and reversed-phase HPLC. Overall this is an excellent book, which is highly recommended. The material in the book is extremely useful and the price is right. The book is recommended as a desk reference for all those involved in protein analysis and as a text at the undergraduate and graduate levels. The authors are commended for a job well done.



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**Advances in Chromatography**, Volume 43, Edited by Phyllis R. Brown, Eli Grushka, and Susan Lunte, Marcel Dekker, New York, NY, 2005, 323 pages. Price: $198.95

Volume 43 of the successful series, *Advances in Chromatography*, is an interesting book. The editors succeeded in bringing together first class scientists to review topics of interest to analytical, physical, organic and other chemists.

The first topic, Gradient Elution, Chapter 1, constitutes one third of the book and is a very important chapter. It deals with the theory and application of gradient elution. To obtain satisfactory separation of both weakly and strongly retained compounds, where isocratic elution fails the operating conditions controlling the retention are varied during the chromatographic run. This can be achieved by gradually increasing the temperature, the flow rate or the elution strength of the mobile phase. The author, Professor Jandera, discussed in detail and with superb illustration and a long list of references, the ins and outs of gradient elution.

In Chapter 2, Dr. King discusses supercritical fluids for off-line sample preparation. The author states that there are good reasons to consider the use of supercritical fluids in sample preparation prior to chromatography, particularly because the fluid is easily removed from the sample matrix after extraction or sample cleanup. The most widely used supercritical fluid, supercritical carbon dioxide ($SC\text{-}CO_2$), is relatively inexpensive, nonflammable, and environmentally benign. This review admittedly focuses on the use of off-line super critical fluid ectraction (SFE) and its variants in preparing samples prior to analysis by chromatography. There are some researchers

who share the view that analytical SFE is a derivative of activity in the field of analytical supercritical fluid chromatography (SFC).

Chapter 3 is a theoretical discussion that deals with the relationship between chromatography, single molecule dynamics and equilibrium. Chapter 4 is a review of solid-phase microextraction (SPME), a useful sample preparation method. This technique integrates sampling, extraction, preconcentration, and sample introduction in a simple single-step procedure. Additionally, it facilitates automation and direct coupling to chromatographic analysis: gas chromatography (GC) and high-performance liquid chromatography (HPLC). When performed in the most known fiber format, SPME is based on the sorption of the analyte on an extraction phase coated on a small fused silica fiber. It is an informative review that is well written.

The last chapter deals with polyelectrolytes as stationary phases for liquid chromatography. In this chapter the authors introduce and identify what polyelectrolytes as stationary phases are. In silica-based columns (normal phase as well as reversed phase), it is possible to work only within a relatively narrow pH range, usually between 2 and 7.5. One of the approaches to overcome this limited pH range is to use new types of polymer-based phases including polymer-clad silica gel particles, which are the subject of this review. These new polymeric phases have an added advantage of offering new and unique selectivities that cannot be attained using conventional silica gel. Most of the polymeric stationary phases in use are neutral. However, the range of polymeric stationary phases can be expanded to include polyelectrolytes. For example, positively charged polymers can be adsorbed on silica particles by electrostatic interactions over a wide range of pH due to the fact that the surface of the silica has partially negative charge. On these positively charged surfaces, it is easy to adsorb negatively charged polyelectrolytes to form a multilayer.

There are two main approaches to making silica-based polyelectrolyte stationary phases. The first approach is to coat the silica gel particles in a batch mode outside the column. Once coated, the column is then packed using conventional high-performance liquid chromatography (HPLC) packing techniques.

The second approach to prepare silica-based polyelectrolyte stationary phase is to coat the column dynamically in situ. In this approach, the coating solution is passed through the column that has been packed previously with the silica support. Conventional chromatographic equipment is used for transporting the coating solution through the column. Of the two approaches, the batchwise method is, by far, the most prevalent.

The dynamic coating technique is an in situ method used to prepare stationary phases for HPLC, capillary electrophoresis, and capillary electrochromatography. Volume 43, although expensive, is a good book to have.

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