Signal Transduction Protocols. Methods in Molecular Biology, vol. 41; Edited by D.A. Kendall and S.J. Hill, The Humana Press; Totowa, 1995. xi+305 pp. $64.50 (pb). ISBN 0-89603-298-1

This book represents the latest addition in the 'Methods in Molecular Biology' series from Humana Press. Currently, receptor mediated cell signaling process belong to the most highly studied phenomena in the biological sciences. During the last years the complexity of signaling pathways has become obvious. The number of receptors, protein kinases/phosphatases and transcription factors that have already identified is staggering. Various methods and assays have been developed in this field and it is quite impossible to cover all techniques used in signal transduction research in a single handbook. David Kendall and Stephen Hill focused their attention to receptors of the G-protein-linked superfamily. The 24 short chapters are self-contained units and fall into major topics, techniques associated with cAMP/cGMP and phosphoinositide/Ca^{2+} signaling pathways. Several chapters are presented covering the mass measurements of key molecules like cAMP, cGMP, phosphoinositide intermediates, diacylglycerol and the important biological mediator nitric oxide. Two chapters describe current methods for the measurement of Ca^{2+} fluxes in permeabilized cells and the quantification of intercellular free calcium ion concentrations. The separation of inositol phosphate isomers by HPLC and single cell calcium imaging techniques are also addressed.

Another group of chapters deals with the analysis, purification and assay of enzymes involved in the formation and regulation of second messengers. This group includes chapters on phospholipases A_2, C and D, adenylyl cyclase and cyclic nucleotide phosphodiesterase isoenzymes. Moreover, a few chapters on the cAMP and cGMP-dependent protein kinases, Ca^{2+}-calmodulin-dependent protein kinase and protein kinase C, enzymes that are activated by second messengers, are included.

The editors decided to add a few supplementary topics that are quite different from the majority of techniques described in this book. Nevertheless, the chapters on radioligand binding, autoradiography and in situ hybridization may be very useful for laboratories dealing with these aspects.

The chapters are in general composed of a brief introduction followed by a survey of all materials required for the experiments and very detailed experimental protocols outlined in a 'Methods' section. Most chapters also contain a 'Notes' section and comprehensive references for further information. However, it should be noted that the latest reference given in most chapters is from 1993. The 'Notes' section seems to be very important and essential for the quality and usefulness of a laboratory handbook. It should contain hints on troubleshooting and reflections on the problems associated with the techniques and the interpretation of results. In general all chapters are of equal very good quality in this respect and fulfill the aims of a truly laboratory handbook. The editors and authors have succeeded in giving very useful descriptions of laboratory protocols for the study of G-protein linked receptors. In summary, this well-organized volume is clearly among the most viable protocol books published in this field and will turn out to be a helpful tool for many laboratories.

Thomas Bittorf

Methods in Molecular Biology, vol. 52, Capillary Electrophoresis Guidebook, Principles, Operation and Applications; Edited by K.D. Altria. The Humana Press; Totowa, 1995. xi+349 pp. $74.50 (hc). ISBN 0-89603-315-5.

Volume 52 of the series 'Methods in Molecular Biology' is indeed a guidebook for capillary electrophoresis containing 20 chapters organized in two parts. Part I is a 'General Guidelines to the Operations of Capillary Electrophoresis Methods and Applications' covering 11 chapters, while Part II, which assembles the remaining 9 chapters, is entitled 'Applications of Capillary Electrophoresis and Specific Technologies.' The first part, which consists of 11 short chapters totaling 122 pages, is written exclusively by the editor K.D. Altria. The other nine chapters making up the second part are written by different experts in the field including the editor.

Chapter 1 entitled 'Fundamentals of Capillary Electrophoresis Theory' is rather an introductory description of CE and has a very limited amount of the theory. In major part, this chapter emphasizes sample introduction rather than the fundamentals of EC. This chapter lists only 13 references. Chapter 2, which is about 'Standard Commercial Instrument Description,' gives no specific examples of commercial instruments, and could have been easily deleted from the book. Chapter 3 is on 'Typical Operating Parameters' describing the various instrument settings (e.g. capillary temperature, capillary rinsing, detector setting, time and mode of injection, etc.). Under capillary rinsing, the author advocates the general use of NaOH without pointing out the fact that not all capillaries can be rinsed with NaOH. Chapters 2 and 3 each contain only 2 references. 'Method Development/Optimization' is the topic of Chapter 4. This chapter gives general guidelines that can be followed in the various modes of CE, and lists 30 recent references. Chapter 5 is on 'Quantitation Procedures' providing a nice overview of the use of internal standards. It is a much more detailed chapter than the preceding chapters in the text. The introduction gives good correlation between HPLC and CE. The use of mathematical equations was a very helpful tool for understanding. This chapter is based on 15 recent references. To further provide the reader with guidelines about quantitation, chapter 6 (21 references) is devoted to 'Optimization of Precision in Quantitative Analysis.' However, this chapter failed to give methods for instruments that are not automated (e.g. home-built instruments). Along the same lines, chapter 7 (22 references) is on 'Optimization of Sensitivity.' In general, this chapter provides an informative and easy to follow discussion on sensitivity. But, the chapter does not (i) discuss sample stacking which would be a vital part of this section and (ii) give specific examples. A well shaped chapter in this book is chapter 8, and it is on 'Method Validation' listing 30 recent references. As a part of sample handling in CE, chapter 9 is a short discussion of fraction collection after CE separation for further studies covering 8 references. Chapter 10 covers 'Troubleshooting.' and attempts to provide the CE users with solutions to common problems using flow charts for quick problem solving tactics. Part I concludes with a 3 page chapter on 'Quick Guide to Running a Successful Separation.' This quick chapter may be useful for a new CE practitioner.

The first chapter in Part II (chapter 12) is on 'Micellar Electrokinetic Chromatography' (MEKC) by K. Otsuka and S. Terabe. Written by the inventor of MEKC, this chapter is a comprehensive (71 references) and easy to follow discussion of the MEKC technique. This was enhanced by the use of meaningful figures and graphs. Chapter 13, which lists 23 references, is a description of 'Capillary Gel Electrophoresis' by A. Guttman. Although it is concisely written, the chapter does not go over the principles of size-based separation. Chapter 14 is devoted to 'Chiral Separation by Capillary Electrophoresis' by M.M. Rogan and K.D. Altria. This chapter discusses the various approaches for enantiomeric separations by CE, covers 80 references and provides guidelines for methods development. However, the four charts illustrating ways for methods development are copies of the same charts used in chapter 4. This repetition could have been avoided by simply referring to the charts in chapter 4. Chapter 15 on 'Electrochromatography' is written by I.H. Grant. This chapter provides some theoretical considerations as well as the practical aspects of the technique. Since capillary electrochromatograhy is still in its infancy, there are only limited applications for the technique. Chapter 16 (31 references) is on 'Application and Limits of Sample Stacking in Capillary Electrophoresis,' and is written by D.S. Burgi and R.-L. Chien. This chapter discusses two main approaches to perform on-column concentration to enhance CE detectability, namely transient isotachophoresis and field-amplified sample stacking. The illustrations provided in the chapter are very useful in helping the reader understand the basic principles of both approaches. The 'Analysis of Bases, Nucleosides and Oligonucleotides by Capillary Electrophoresis' is the topic of Chapter 17 by H.E. Schwartz and K.J. Ulfelder. This chapter listing 83 references covers a little bit of everything concerning the application of CE to nucleic acids including the various modes of separation and detection approaches as well as the purity control of synthetic oligonucleotides and DNA sequencing.