

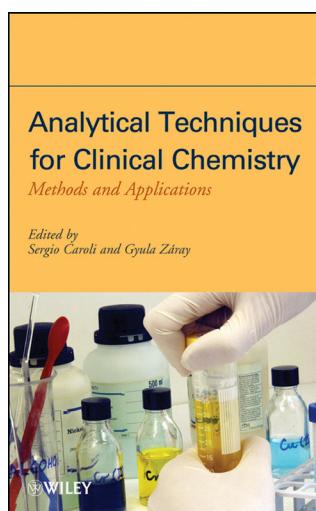
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BOOKS AND SOFTWARE IN REVIEW

## Sergio Caroli and Gyula Záray (Eds.): Analytical techniques for clinical chemistry: methods and applications

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### Bibliography

Analytical techniques for clinical chemistry: methods and applications  
Sergio Caroli and Gyula Záray (Eds.)  
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**Book's topic** Clinical chemistry (also known as clinical pathology, clinical biochemistry, and medical biochemistry) comprises the area of clinical pathology that is generally concerned with the analysis of bodily fluids. The title of the book raises the expectation that the reader will get an overview of the analytical techniques used in a clinical chemistry laboratory. Unfortunately, however, the authors only refer to analytical chemistry applied in clinical research covering a wide variety of general aspects in clinical trials including also chapters on the analysis of pharmaceuticals, bioimaging, and the use of X-ray techniques. The analysis of metals and trace elements is the focal point of the book.

**Contents** The book contains 25 chapters and is divided into three parts. The first part, entitled “Exploring fundamentals,” contains chapters 1–6. Chapter 1 extensively describes the Good Clinical Practice Guidelines, as well as the guidelines for bioequivalence studies. Chapter 2 is dedicated to quality, and describes the Good Laboratory Practice Guidelines (which are only applicable to animal studies), the Good Manufacturing Practice Guidelines, the Good Distribution Practice Guidelines and the Good Pharmacovigilance Guidelines. Finally, some ISO standards are also briefly described. Chapter 3 is dedicated to uncertainty and preanalytical variables. Chapter 4 describes the role and significance of reference values, with heavy metals and trace elements used as examples. Chapter 5 imparts some basic knowledge of sample collection, storage, and pretreatment, while the last chapter in part 1 is dedicated to metal toxicology in clinical, forensic, and chemical pathology.

Selected applications are presented in part 2. Chapters 7, 11, 12, 13, 14, 15, and 17 describe different aspects of the analysis of metals and trace elements using plasma-based techniques (i.e., ICP-MS) and atomic spectrometric techniques. Chapters 8 and 9 both describe the analysis of drugs during the manufacturing process (i.e., according to the pharmacopeia). Chapter 10 discusses the detection of drugs in biological fluids for doping control. Unfortunately, neither of the authors work in a doping laboratory, which may explain the brevity and superficiality of the chapter. Chapter 16 provides a nice overview of the use of biosensors for drug analysis. Chapters 18 and 19 are dedicated to applications of LC-MS/MS in clinical laboratory diagnostics. They give an excellent overview of all of the different aspects of LC-MS/MS analysis performed in a clinical laboratory. Chapter 20 describes biomarkers of oxidative stress, which are often used in research into several diseases. Chapter 21 portrays the use of X-ray techniques in medical research, including the

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determination of element distributions in tissues or even the chemical characterization of single cells.

Future trends are addressed in part 3. Chapter 22 describes different aspects of selenium intake, including current instrumental analytical approaches. Chapter 23 is dedicated to breath analysis, and presents relevant sampling methods, analytical techniques, and applications. Proteo-metabolomic strategies and their role in the future of drug development are discussed in chapter 24. This chapter comprises almost 100 pages and gives a good overview of the development of molecular markers, as exemplified by nephrotoxicity biomarkers. Finally, chapter 25 summarizes the changes that have occurred, and are predicted to occur, in informatics and global standardization in laboratory medicine.

**Comparison with the existing literature** This book is unique in its composition, as it focuses mainly on the analysis of heavy metals and trace elements but also includes some chapters that describe different aspects of the analysis of biological fluids and some other chapters on the analysis of pharmaceutical products. Based on the title of the book, it can be compared with other books that describe analytical techniques in clinical chemistry or clinical biochemistry. However, only

two of the chapters (18 and 19) are actually dedicated to clinical chemistry, so this book cannot replace any other textbook on this topic.

**Critical assessment** The title of the book is misleading, and readers expecting to use it to learn about analytical techniques in clinical chemistry will be disappointed. Heavy metals and trace elements are analyzed only very rarely in clinical laboratories (and in the context of clinical trials), so those chapters will only be of interest to specialists in this area. No common thread linking the different chapters is apparent, and the whole book appears to be the accumulation of multiple chapters without any logical common thread.

**Summary** *Analytical Techniques for Clinical Chemistry* is a book that describes different aspects of analytical chemistry that are used in clinical research. However, only two of its chapters actually deal with laboratory medicine in patient care; instead, its focus is mainly on the analysis of heavy metals and trace elements. This book cannot be recommended to readers working in a clinical laboratory, but it may be of interest to anybody working in pharmaceutical research or for contract research organizations.