Book Review

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MALDI MS: a practical guide to instrumentation, methods and applications

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Matrix-assisted laser desorption/ionization (MALDI) has come a long way since publication of the principle and its acronym in 1985 and a host of books, book chapters and review articles have tracked the instrumentation developments, methods and field of application of this 'indispensable tool' in the life sciences and in polymer analysis. Despite the plethora of secondary literature sources on MALDI MS and its applications, the present text—edited by two of the pioneers of modern mass spectrometry—is a most welcomed and timely addition. The book is intended to be a practical guide, with an emphasis on providing practical information for analysis for a wide variety of molecules that are at the core of life. Even with this emphasis, it is also an admirable resource for gaining understanding of the underlying mechanisms of MALDI. The nine chapters are well crafted, and integrated to provide a well-balance whole. Whilst all chapters make ample reference to the primary research papers, none are—nor were intended to be—comprehensive reviews of the literature. This overview approach is welcomed since a greater emphasis on literature review would probably have distracted from the clarity of the messages evident in much of this text.

The first chapter focuses on the central issues of MALDI necessary for the user to understand for an efficient application of the technique. A chapter on instrumentation follows, which discussed lasers in MALDI, vibrational cooling and tandem MS, prior to consideration of different mass analyzed design; the emphasis is on commercially available instrument configuration. Chapter 3 describes a range of applications of MALDI MS in protein chemistry and proteomics, and perhaps here—more than any other chapter—there was scope for more extensive consideration of the issues. Chapter 4, 'Microprobing and Imaging MALDI for Biomarker Detection', gives a cautious evaluation of the techniques for biomarker detection and serves to emphasize the limitations of MALDI for cellular characterization. Present and future areas of application are touched on, but some readers may be disappointed by the cursory treatment of certain fields presently undergoing rapid expansion. For example, fingerprinting by MALDI-MS for differentiation of closely related bacteria is considered in only five lines of text, supported by a few rather dated references. Chapter 5 explains why MS is not as much of an enabling technology in genetics and genomics as it is in proteomics, before considering the various MALDI-TOF-MS based assays that have been developed for the analysis of nucleic acids. Chapters on MALDI MS of glycans, lipids and polymer characterization follow. The final chapter (Chapter 9) explores the quantitative and qualitative investigations of MALDI MS for molecules with a mass less than 1500 Da. By the end of the book the reader is left in no doubt as to the power and flexibility of MALDI MS as an analytical tool, not only for high-molecular weight biomolecules.

Editorial control is generally tight, but there are lapses; referencing styles are not uniform, and there is some inter-chapter repetition relating to historical developments and fundamental mechanisms. The book is very much a 'practical guide' with an emphasis on consideration of the relevant issues, rather than an instrumentational/methods handbook. It may well become the bestseller in its field and, given the increasing pervasiveness of MALDI MS in the life sciences and beyond, has a wide potential readership within academia (particularly at the postgraduate level), research institutes and industry. Despite rapid on-going developments in MALDI MS, the book's solid consideration of the fundamental practical issues should extend its useful shelf-life beyond a few years.

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