



Book review

Buddy D. Ratner, et al. (Eds.), Biomaterials Science: An Introduction to Materials in Medicine, Academic Press, ISBN 0-12-582463-7, 2004 (864pp., \$95/£49.99).

A complete biomaterials text

The new, expanded edition of Biomaterials Science provides comprehensive coverage of this growing, multidisciplinary field for students of all backgrounds, says David F. Williams.

The 2nd edition of this textbook on biomaterials science was 6 years in the making. It is considerably longer than the 1st edition, which sold over 10,000 copies and was directed at a multidisciplinary audience ranging from students of medicine to engineering. The 2nd edition has the same objectives, although by now the target audience is even larger and more diverse. Over 100 of the world's leading biomaterials scientists have participated in this effort and the four editors have to be congratulated for their diligence, patience, and coordination skills.

I have a particular personal pleasure in reviewing this book, knowing all four editors well and being involved in biomaterials science research and education for the last 35 years. I share their concern that this subject requires multidisciplinary textbooks, which will enable students from wide-ranging disciplines to gain an understanding of all relevant basic sciences and clinical applications. This is becoming more, rather than less, difficult as the breadth and depth of the contributing sciences and the nature of biomaterials applications are extended. Once, we were primarily concerned with traditional metals and alloys, plastics, elastomers, and ceramics, with a small interest on treated biological materials. Now, some of the traditional materials are being marginalized, with the rise in interest in so-called bioactive and biomimetic materials, with newer concepts of surface modifications, self-assembly, nanocomposites, and environmental responsiveness. Once, we were concerned with implantable medical devices. Now, in addition, we have drug-delivery systems, tissue engineering and regenerative medicine, biosensors, functional organ replacement, microelectromechanical systems, in vitro diagnostics, and protein microarrays.

The challenge to editors of a textbook of this nature is to encompass the traditional components alongside the new concepts and, indeed, to ensure that these different

parts merge into one coherent story. In general, this has been done extremely well. Some authors have been a little more diligent than others in updating their contributions, and perhaps perversely some of those who did their updating first have produced pieces that were not entirely current by the time the textbook was published. But this is inevitable in such a comprehensive text covering a fast-moving subject. The editors, in their preface, indicate that the value of a multiauthored volume lies in the inclusion of a breadth of opinions, avoiding the bias and self-directed emphasis associated with single-authored texts. I personally do not think that this is a foregone conclusion, and the value of single-author monographs and multiauthored texts depend on the quality of the author and editors, respectively. Nevertheless, if it has been the editors' objective to provide such a breadth of opinion, they have to be congratulated most sincerely, for the structure and composition of the text, which has 78 individual contributions, several appendices, and over 800 pages, is excellent and comprehensive. It is not sensible to mention all subjects covered in the book, but the three main sections deal with materials science and engineering, biology, biochemistry, and medicine, and the practical aspects of biomaterials. In the main, the individual contributions are well-written and edited, with a good balance of text and illustrations, and include good bibliographies containing classic papers and some of the more recent, groundbreaking research contributions.

This book will undoubtedly fill a huge gap in the provision of authoritative texts in medical engineering. It is commended to all teachers of biomaterials science in whatever branch and clinical application they are engaged in. Indeed, it is the only such text that currently covers this area comprehensively.

This book review originally appeared in Materials Today www.MaterialsToday.com

David F. Williams, Materials Today (2005) 8 (2), 60

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