

Book review

An Introduction to Biomaterials, Scott A. Guelcher, Jeffrey O. Hollinger (Eds.), CRC Press, Taylor and Francis Group, (2006). 552 pp., € 89,90. ISBN 0-8493-2282-0.

The present book is, as the editors state in the preface, directed to upper level undergraduate and graduate students in the biomedical disciplines. It gives a compendium of currently remarkable biomaterials in several fields of interest, but as the editors themselves mention, the book can not cover all aspects of biomaterial design, development, and applications, and therefore it is essential to make use of the key citations provided by the chapter authors to go into further details. This is also necessary, since most of the chapters can only give a brief outline of the multitude of applications in which biomaterials are of use today.

The book is divided into several parts, each of which enables the reader to look at biomaterials from a different point of interest. Part I, which includes chapters 2–6, gives an introduction into biomaterials, their biological requirements, as well as, important concepts of biocompatibility. Additionally it provides insight into cell-material interactions, protein adsorption, as well as concepts for in vitro and in vivo testing, on top of regulatory issues. All these factors are crucial for the development and the design of biomaterials. They are also therefore a good opening for the book, which focuses on more details for each biomaterial in the part that follows. This, part II, consisting of chapters 7–18, introduces the reader to biomaterials of either natural or synthetic origin that are in clinical use or are subjects of current research, for example fibrin, polyurethanes, hyaluronan and chitosan. Insight into the synthesis, characterization, and the applications of such biomaterials is given. Chapter 8 gives a general idea of biomaterials and polymers, derived from amino acids, that are currently of interest, especially their sources, molecular structure, mechanical properties, as well as physiological responses, but it does not include their use as scaffolding or retaining devices. Unlike chapter 8, chapter 9, is dedicated to polyesters which already enjoy commercial success, and which are expected to play an expanded role in implantable medical devices and controlled drug delivery, goes more into details. The last nine chapters, 19–27, combined as part

III, allow the reader to learn about the clinical applications of biomaterials with a main focus on tissue engineering, such as bone, nervous or ligament tissue, and on implants for either orthopedic or dental use. Only a small fraction of this part, chapter 19, is dedicated to the use of biomaterials as drug or gene delivery vehicles, but provides established information about their mechanism of action. One would have expected this part to focus solely on the uses of before described biomaterials, but still new biomaterials are introduced. One chapter, which I really enjoyed reading, is chapter 24 that deals with cardiovascular tissue engineering, but I was somewhat disappointed to only find a small section on blood vessels prosthesis and in that context the according materials like ePTFE and PET and their modifications.

Some of the chapters conclude with a question and answer section to recapitulate on important information and enable the reader to reflect upon the newly obtained knowledge. I consider this a useful device for one to find out whether or not the relevant information was understood and can be applied to solve the problems given. Overall the chapters are well written and illustrated with graphs and figures to underline the, in the text described, information, although some of the figures lack the citation.

The book stresses tissue engineering with a strong clinical focus, and far less emphasizes the drug delivery aspects, but this was to be expected when you look at the editors, Jeffrey O. Hollinger and Scott A. Guelcher, whose backgrounds clearly reflect the orthopedic field. After all, this is a suitable book for those who want to get an overview into a variety of biomaterials and the broad range of applications in which those can be found and used.

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