

young scientists and more experienced professionals will find useful references to go deeper in a particular subject and help them to develop the use of DEA in the pharmaceutical field in both Academia and Industry.

Duncan Q.M. Craig
University of London
UK

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Encyclopedic Handbook of Biomaterials and Bioengineering

D.L. Wise, D. Trantolo, D.E. Altobelli, M.J. Yaszemski, J.D. Gresser, E.R. Schwartz (Editors), Marcel Dekker, New York; 1995. 3600 pages, ISBN 0-8247-9594-6.3800

This encyclopedic handbook covers most fields, dealing with biomaterials. It is divided into two main parts, each of which are presented as two volumes. Part A treats materials, whereas Part B refers to various applications of biomaterials. More than 100 authors with academic, clinical or industrial backgrounds, contributed to chapters describing their latest research programs. Most chapters contain a brief historical introduction, a material and method description and quote an average of 150 citations. The book is well illustrated with either clinical photographs, histological sections, radiology or microscopy pictures.

Part A covers materials, such as polymers, metals and ceramics, by recalling their physicochemical characteristics, stability and sterilizability as well as biocompatibility. Starting with general surgical principles required for biomaterial implantation and some physiological models useful for the evaluation of implantable devices are also discussed. An interesting guide to materials selection criteria, describing briefly the main properties and potential applications of various biomaterials, is also provided.

A few chapters deal with tissue and host response, either qualitatively or quantitatively. Cell interactions with implanted materials such as the influence of proteins, neutrophils and the immune system are also carefully reviewed.

Biodegradation of polymer devices are explored extensively, with an important chapter on enzymatic degradation and an detailed discussion on biodegradable sutures of more than 100 pages provided by C. Chu.

The advantageous possibility of modifying the materials surface is also treated in this handbook, with

detailed presentations of new surface characterization methods, such as photochemical coupling technology, plasma gas discharge and different scanning microscopical techniques.

Polyesters devices, mainly copolymers of poly(glycolic-co-lactic) acid, are reviewed in depth, with complete descriptions of synthesis reactions, physicochemical characterizations and degradation pathways. Polyesters properties, concerning their possible applications in various fields, e.g. microspheres and orthopedics, are also presented in full.

Several chapters are dedicated to collagen, with particular applications in tissue-inducing implants and wound dressings. Other materials such as silicone, hyaluronan, chitin and polyurethanes are discussed only marginally.

Part B considers various applications of biomaterials. This section deals with engineering problems, mainly with general requirements for achieving successful implants in orthopedy. Metallic implants, bone and maxillo-facial restorations as well as joint replacement arthroplasty are carefully reviewed. An interesting description of fiber reinforced poly(ortho ester), biogenic and synthetic apatite and various composite materials is provided, as well as a detailed presentation of metals (e.g. titanium and zirconium alloy) and their bone-interactions. A few chapters also discuss the effects of biomaterials on bone substitution and repair as well as the various factors affecting bone ingrowth.

The rest of the handbook is divided into miscellaneous chapters, covering vascular applications of biomaterials, such as grafts and prostheses, with an particularly interesting chapter on hemocompatibility. The possible surface modification to reduce thrombogenicity and the various problems related to heart valves are briefly reviewed. Ocular application is only barely treated and is reduced for the most part to ophthalmic collagen devices and intraocular lenses.

This handbook ends with a detailed discussion on different materials for dental application, such as ceramics, porcelains, glassy polymers, composites and alloys.

This encyclopedic handbook takes an interesting multidisciplinary approach and is an excellent reference tool. For this reason it can be recommended strongly, even if the bulk of the information concerns mainly polyesters and orthopedy.

Zignani Monia
School of Pharmacy
University of Geneva
Switzerland

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