

ment and characterization. In general, the chapters do not only touch the surface but present a deeper overall insight.

The nine parts of this book are each split up into three to six chapters of different specialization. In the first part, Jochanan Boss reviews the concept and relevance of biocompatibility followed by four chapters focusing on specific aspects related to biocompatibility. This leads into the second part on how to evaluate biomaterials. The sections describe *in vitro* cytotoxicity testing, animal models for preclinical testing, the evaluation of blood–biomaterial interactions and the application of confocal laser microscopy for the characterization of biodegradable polymers. The segments of part four on bioactive materials and delivery vehicles present six different cases of drug delivery matrices. Starting with a very short chapter on polymeric drug delivery to the brain, the second section describes tissue adhesives as vehicles giving a broad background and results on delivery of FGF-1 for wound healing. The other brief drug delivery chapters focus on restenosis, liposomes coated with polysaccharides, polysaccharide biomaterials (unfortunately only touching on small molecule conjugates) and carriers for bone morphogenetic proteins used by the group of Kazuhisa Bessho. In the 12 chapters of parts four and five ceramic and metallic materials as well as fixation devices based on biodegradable polymers are discussed. These sections do not provide a complete overview but focus on specific engineering aspects in combination with medical application. However, if you look for information on the use of tricalcium phosphate, biphasic calcium phosphate, bioglass, glassceramic or zirconia or search for a comparison of data for different materials made of hydroxylapatite and their mechanical properties, you will not be successful. Besides a chapter on the use of polyorthoesters, all other chapters on biodegradable polymers concentrate on PLA/PLGA materials. The authors cover clinical experience with these materials and the engineering, testing and clinical evaluation of material with buffers added in order to reduce the negative effects of the pH decrease with polymer degradation and with Al<sub>2</sub>O<sub>3</sub> fiber reinforcement. Mostly in the work by the group of Donald Wise there is some redundancy and overlap between the chapters. Part six on biomaterials for reconstruction of bony defects contains four short chapters which only give basic information on the repair of cartilage using biomaterials and tissue engineering methods and preclinical evaluation of bone graft substitutes. Furthermore, cell seeding on materials is discussed and the development and evaluation of poly(propylene glycol-co-fumaric acid) is described by the group of Donald Wise. The next part, which is not as strong as previous parts, deals with collagen-based biomaterials providing an overview of the literature on cross-linking and immunology of collagen and ten pages scratching the surface of collagen scaffolds for tissue regeneration. The eighth part considers biomaterials in skin applications starting with a detailed summary on techniques for assessment of skin substitutes with respect

to wound healing rate, tissue health and function. The section on biomaterial-enhanced regeneration for skin wounds is disappointing as it sticks to general statements on biocompatibility and some ramifications in implant design. Also the exact same results (and graphs and parts of the text!) as already presented in the chapter on the use of tissue adhesive, and specifically fibrin glue for delivery of FGF-1, are repeated. Am I the first person to realize this and who else is left with a bitter aftertaste? The third short chapter on sonophoresis does not fit in well thematically. Finally, a short outlook is provided on new biomaterial aspects, such as ideas for the use of shape memory alloys, the applications of chitin, the biological effects of hydroxamic compounds, especially their cytotoxic activity, and the addition of gelatin to increase the clot adhesive strength of fibrin adhesive.

In summary, some chapters are less convincing, too short and do not fulfill the idea of a handbook, a few sections provide a sound overview and most present specific research results. The strength of this book is the combination of material development and characterization aspects with clinical evaluation. Do not expect to find a handbook which delivers an overview but instead a volume with extended conference proceedings. For a general introduction, more complete surveys or more detailed information, for example on mechanical testing, bioceramics or drug delivery vehicles, more specific textbooks and journals are available.

*Dr Wolfgang Frieß*

Department of Pharmaceutical Technology,  
Friedrich-Alexander University of Erlangen-Nürnberg,  
Cauerstrasse 4,  
91058  
Erlangen,  
Germany

PII: S0939-6411(00)00119-3

### ***Peptide and Protein Drug Analysis.***

Ronald E. Reid (Editor), *Drugs and the Pharmaceutical Sciences*. Vol. 101, Marcel Dekker, New York, 2000; 885 pages, ISBN 0-8247-7859-6

This very good addition to the pharmaceutical literature concerning peptides and proteins contains a mass of valuable information. The evident aim of this book is to provide a broad, basic understanding of the strategy and techniques behind the structure, function, chemical, and physical analysis of polypeptides used as therapeutic aids. We find four sections in this book. Section 1 is entitled 'Strategies' and covers comprehensively all aspects of peptide and protein design and synthesis. All of its ten chapters are of high quality and present information of both a theoretical and a practical nature. The physical stability of proteins comes a bit short in