corresponding genes in the mouse and in man. The reader is guided by short chapters, one for each cytokine and for each cytokine receptor, which are written by cytokine specialists.

Is this book a good guide? It is the best concise and up-to-date information on cytokines I know, and probably the source of choice for anybody wanting to collect rapidly the essentials on single effector proteins, their receptors and the way they signal.

Given the topic, it is almost mandatory to rely on a multitude of authors. From the specialists one should expect an accurate overview focusing on well established facts. Speculative information should be declared as such. Personal choices in content, references, emphasis and layout are the main drawback of the multi-author approach. The Editor (who tends to be blamed for all the mistakes while praise for success goes to the authors) must make sure that the single contributions are as homogeneous as possible. Only if this operation succeeds, will the book become a true guide: A simple, reliable, easy-to-use compilation of the essentials. In this respect, the book could be improved considerably. The same structure and the same subtitles should be adopted for all chapters on cytokines on the one hand and on receptors on the other. It is a good idea to start with a summary, but it is disappointing to see how much this information differs from chapter to chapter in content and pitch. As a test, I compared the summaries of the first ten cytokine chapters. The one on IL-6 is excellent, those on IL-1 and IL-5 acceptable, those on IL-2 and IL-4 uninformative, and the five remaining ones could be improved a lot. Referencing is also rather variable. In my opinion, 20 references per chapter should suffice, and no references should appear in the abstract. Outstanding and recent reviews in respectable and easily available periodicals should be favored. There are too many references to single books which are largely useless since the books are normally out of reach. An effort could also be made to standardize the illustrations. The sequences at least could be made much more readable by adopting the same font and layout throughout the book. It would be useful to standardize the schemes of the cytokine receptors (starting with the color pictures) and the 3D structures of the proteins, and to present the gene structures schematically. Peintre naif schemes (e.g., Fig. 2, p 51; Fig. 1, p 165, Fig. 2, p 200; Fig. 2, p 238) should be eliminated. Since I work on chemokines, I checked this topic in some detail. The major problem is the omission of the description of CC chemokines other than MCP-1, and the lack of a chapter on CC chemokine receptors. In the chapter on CXC chemokines I noticed some disturbing mistakes. In the Table at the end of the book, chemokines are subdivided into an 'MIP1 family' and an 'MIP2 family', terms that are not used for human chemokines and not found in the chemokine chapters. Furthermore, IL-8 is listed as a CC chemokine.

Nicola's Guidebook may be compared to the 'The Cytokine Facts Book' by Callard and Gearing. The Facts Book presents the sequences and the protein and gene structures very clearly. The accession numbers (which are somewhat hidden in the Guidebook) and other useful information are highly visible. The brief description of the 'MOLECULE', by contrast, is mostly uninformative and occasionally misleading, and the amputated references are problematic. The Facts Book is handy for the initiated reader looking for quick structural information. Most chapters of the Guidebook, by contrast, can be used by almost anybody to gather first information on a given cytokine, and to select further readings. Referencing with full title is, of course, very useful. My advice? Start with the Guidebook and consult the Facts Book if you get lost within the structural information.

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Bioreactor System Design; Edited by J.A. Asenjo and J.C. Merchuk, Marcel Dekker, Inc.; New York. 1994; xiii + 620 pp. $195.00. ISBN 0 8247 9002 2

This edited volume describes different aspects of bioreactor system design. The various authors review subject areas in which they have specialized research interests. Focus is on the bioreactor design, which is covered in 10 of the 16 chapters in the book. In the foreword E.T. Papoutsakis states: 'There is plenty of material here to satisfy a large spectrum of needs, from those of the practical-oriented biotechnologist and applied biologist to the educational needs of the quantitative- and fundamentals-oriented graduate students'. I agree with him on the first account, whereas I doubt that the text would be of much use for teaching purposes. The text is not sufficiently homogeneous and there are too many repetitions of basic material, e.g. in chapter 5, 18 pages are devoted to mass transfer in bioreactors, a topic which is covered extensively in two other chapters.

The text is introduced with an overview (Design of a Bioreactor System: Overview by J.C. Merchuk and J.A. Asenjo) and thereafter follows three parts: Part I covers biological systems and media design (three chapters); part II covers bioreactor design (ten chapters); and part III covers bioreactor support systems (two chapters).

In chapter 2 (Organism Selection) F.J. Castillo gives an extensive review (371 references) of selection of an organism for a bioprocess. The review is short and concise, and it gives the necessary information required for more detailed studies. Furthermore, it includes a valuable table listing institutions and companies (with complete addresses) that provide services in connection with selection of organisms. Chapter 3 (Bacterial, Yeast and Fungal Cultures by M.D. White, B.R. Glick and C.W. Robinson) discusses the influence of choice of microorganism, and chapter 4 (Design, Formulation, and Optimization of Media by R.J. Ertola, A.M. Giulietti and F.J. Castillo) reviews media design and the influence of co-factors on growth and product formation.

Chapter 5 (Fundamentals of Bioreactor Design by C. Merchuk and J.A. Asenjo) covers different topics such as stoichiometry, kinetics, mass transfer and heat transfer. These topics form the foundation for any bioreactor system design, and concise presentation is therefore desirable. Unfortunately this is not the case. The material is presented in the classical way with an uncritical listing of simple (and a few more detailed) stoichiometric and kinetic models. In the presentation the nomenclature is inconsistent and there are even some misunderstandings, e.g. a statement that a degree of reduction balance gives an additional relationship to the elemental balances. Chapter 6 (Stirred Tank Bioreactors by M. Reuss) and 7 (Pneumatically Agitated Bioreactors by K. Schügerl and A. Lübbert) deals with mass transfer in bioreactors. Both chapters are of a very high quality with illustrative examples of simulations and experiments. Chapters 8–12 cover more specific bioreactor systems (Membrane Reactors by P.M. Salmon; Immobilized Microorganism Bioreactors by H. Fukuda; Immobilized Animal Cell Bioreactors by M.S. Croughan, T.-W. Chiou and D.I.C. Wang; Plant Cell Bioreactors by P.D.G. Wilson and M.G. Hilton; Photobioreactors by A. Prokop and L.E. Erickson). Chapter 13 has a short overview of different Bioreactor Operation Modes by T. Yamane, with a presentation of the basic mass balances. These simple balances are important for any design problem, and considering the title of the volume this material is not given much space. Thus it is treated in much more details in several textbooks. The last chapter in part II of the book (Scale-Up by C. Solà and F. Gòdia) is a good overview of different scale-up approaches with a few case studies.

The last part consists of two chapters devoted to Sterilization and Containment (by A. Sinclair and M.H.J. Ashley) and to Bioreactor System Supplies (by T.M. Roberts, M.J. Kearns and T.J. Latham). These chapters give a short overview of the topics and they may be of interest to researchers involved with the more practical aspects of bioreactor design.

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