

kinetic equation, Eq. 4.2.22, it is clear that (i) the solution is a single exponential, a monotone, increasing function of time, and therefore can not have a maximum, and (ii) the stated maximal value is not an extremum, but is the limiting value obtained at infinite time! This is easily derived from the actual solution of the differential equation 4.2.22. It thus seems that the kinetic model is not describing the data in Fig. 4.5.

Throughout the book the author strives to define experimental conditions such that the solutions to the kinetic problems will appear as sums of exponential functions, i.e. to find conditions such that the underlying differential equations are of the first order. Although this is conceptually simple it does have the disadvantage that fitting sums of exponentials to data is notoriously difficult, particularly if the corresponding eigenvalues are not too different. The author warns against this problem by providing an example of two functions, both sums of exponentials, that will be a real challenge to unsophisticated

fitting programs. Furthermore, even for relatively simple kinetic schemes the solutions to the differential equations will be too complex for a complete extraction of rate constants from the data, and these are, after all, the quantities of real interest. Only a few pages are devoted to a discussion of the main principles of fitting equations to data, but the book does not mention the possibility of fitting rate constants directly to differential equations without solving them. User friendly programs for this purpose are now available also for the PC.

The book has a pleasing format, and the layout is very good. The main goal of the book, that of demonstrating the similarity of models from somewhat different fields of biological research, would seem to have been achieved. But for the reasons described above, anyone who really wants to learn the trade in kinetics should look elsewhere for guidance.

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T Cell Receptors; Edited by J.I. Bell, M.J. Owen and E. Simpson, Oxford University Press, New York, 1995. xx + 482 pp. £29.50 (pb). ISBN 0-19-262419-9.

This is an excellent and comprehensive book that deals with one of the most exciting field of immunology. Since the discovery of the T cell receptors, a little over ten years ago, there has been an explosion of activity in this area and the achievements have been very impressive. In this period immunologist and molecular biologists have acquired such an extensive amount of information on the many different aspects of the structure and physiology of the T cell receptors that it is becoming increasingly difficult, even for the experts, to have an updated clear vision of this field. Thus a comprehensive treatise on this subject was very much needed. The editors have to be congratulated for this excellent work.

In general, and with rare exceptions, all the chapters present brief and concise background information and an extensive list of references which provide key articles to support the presented information.

The book starts with a highly readable introduction by J.A.A.P. Miller that presents a historical overview of the subject based on personal experience. The main body of the book subdivided in four parts, each one containing several specialized articles.

Part one deals with T cell populations and the first four articles provide a complete description of the specificity and functions of the different T cell subsets. The next two articles deal with the human and murine T cell repertoires. Here the readers will find all the information on the state of the art of this complex subject. I have particularly appreciated that, in one article, the authors have also dedicated particular attention in describing the distortions of the T cell receptor repertoire that occur in several human diseases. In this part of the book the reader will also find an appreciable description of the methods currently used to quantitate levels of TCR RNA. The last chapter of part one deals with the role of peptides in positive and negative selection. This chapter is essential for those who want to approach the problems connected with the basic paradox of a single TCR inducing positive or negative selection.

The second part highlights T cell functions. All aspects of activation and tolerance are described in four contributions. The first two articles deal with the biochemical pathways of TCR signal transduction, including Ca^{2+} influx, inositol lipid turnover and the activation of protein kinase C. The third review describes the importance of transgenesis for studying thymocyte development and selection, as well as the role of T cells in a wide range of immunological phenomena. This article provides an interesting and critical overview of the advantages and the limits of using TCR transgenic mice. The last chapter of this

section deals with superantigens, a group of molecules with particularly intriguing biological activities. Here Acha-Orbea provides a detailed description on the current knowledge about superantigens and describes his personal view on how these substances have been used as tools to learn several aspects of immune response and tolerance.

The third section is devoted to T cell genes. The five articles provide a complete description of our current knowledge of the structural TCR genes as well as on the mechanisms of recombination, developmental regulation and allelic exclusion. Particularly useful is the tabulation and nomenclature of the human and murine TCR α and β variable regions and the inclusion of a plate section showing the alignment of these sequences and how they are related to each other. These chapters, written by the most outstanding scientist in the field, are valuable references that should be present in the library of every immunologist.

The last section covers most of the aspects of T cell proteins. The apparent plasticity of the TCR-CD3 complex is discussed in great details by Terhorst and his collaborators. Hilyard and Strominger, on the other hand, provide an extensive review on the existing structural information for the TCR based on molecular models generated from protein sequences and the detailed information provided by the crystal structures of MHC-peptide complexes. Models of structural interactions between bacterial superantigens and MHC class II and TCR are discussed in a more general context of physiological TCR-ligand interactions by Fraser and Huston. Finally H. Ploeg describes the different steps involved in the biosynthesis of MHC and their relevance for antigen presentation.

Given the different aspects of T cell receptors, this book is certainly a great, timely and welcome effort to integrate the different facets of TCR biology and function in one comprehensive reference. It is the strength of the editors not only to have chosen some of the best experts in the field but also to have combined their contribution in such a way that the reader is never left with a discontinuous mixture of unrelated entities, rather the reader will discover how the structural and functional aspects of TCR biology are interrelated and cannot be separated from each other.

Thus *T Cell Receptors* is of great interest not only for newcomers, but also it represents an indispensable reference to those already actively engaged in studying these fascinating molecules.

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