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Immunology and Cell Biology

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Book Reviews

ATLAS OF IMMUNOLOGY, 2nd edition

Edited by JM Cruse and RE Lewis, CRC Press, Florida, USA, 2004. 835 pages. ISBN 0849315670. Price US\$99.95.

This book sets out to be an atlas of immunology. The foreword emphasizes that its novelty lies in more than 1200 figures and succinct definitions of basic and clinical immunological concepts. Although most immunology textbooks available are very well illustrated, particularly when it comes to explaining the basic mechanisms of disease, there is still a niche for a book one can dip into to get accurate and up to date definitions and find photos relevant to immunopathology. Unfortunately, this book does not fulfil these expectations. Remarkably, even though this is the second edition, it is out of date, with an absence of many important discoveries made over the past decade that have contributed to the understanding of lymphocyte differentiation and immunopathology. Exactly how out of date it is is hard to judge, because the authors have decided to break with tradition and omit referencing altogether. But this is a book that eschews convention. Ostensibly, it is an illustrated dictionary of immunology, but unlike most dictionaries, it has dispensed with the constraints imposed by alphabetical ordering of entries. Instead, the editorial decisions about what goes in, and where, could best be described as stochastic.

The illustrations are generally of poor quality and are extremely simplistic. For example, the new chapter on Comparative Immunology contains more than 20 large hand-drawn illustrations of various animals. The evolution of immunity is a fascinating but sometimes difficult topic, but the principal point of confusion precluding an in depth understanding of this subject is unlikely to be distinguishing a frog from a chicken. This text is also replete with redundancy. It is remarkable that two authors have exceeded a level of repetition usually only achieved by in-depth multi-authored texts. In addition, the coverage is remarkably uneven. If there is a highlight in this book, it is the first chapter on the History of Immunology, which contains photographs of many distinguished immunologists. Nevertheless, Peter Bretscher would be nonplussed to see his famous two-signal model of lymphocyte activation referred to as the 'Brester' theory.

This book provides immediate access to simple definitions, so it may be of some use on the shelf in the clinical or research lab, but the lack of depth and references to recent developments means that it is unlikely to be a useful addition to the immunologist's personal library.

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IMMUNOCHEMICAL PROTOCOLS, 3rd edition

Methods in Molecular Biology, Volume 295
Edited by Robert Burns, Humana Press, Totowa, New Jersey, 2004. 317 pages. ISBN 1-588-29-274-6. Price US\$99.50.

Immunochemical Protocols, edited by Robert Burns, explains and exemplifies many of the techniques that are used for the production and use of antibodies. As is usual with books from Humana Press in the *Methods in Molecular Biology* series, each chapter (there are 22) generally has a brief introduction providing background on the specific area under study, followed by a wealth of technical detail and discussion of the advantages and limitations of the methods described. Robert Burns provides a broad overview of antibody induction in Chapter 1, including experimental details and also a note about the importance of legislative issues when using animals for antibody production, something which is often forgotten or ignored.

Chapters 2 to 6 describe the generation of monoclonal and polyclonal antibodies directed to various antigens using a variety of well explained techniques. The types of antigen used vary from whole recombinant proteins to phage particles to synthetic peptides, allowing the reader to select the method best suited to their own problem and the resources of their laboratory. In each of these chapters, the methods described are those favoured in the authors' laboratories, but other possibilities are also considered. Chapter 7 provides a valuable explanation of the techniques of antibody purification, an area often neglected but so important given the tasks that are often asked of these reagents.

Chapters 8 to 16 describe different methods of labelling antibody with enzymes, fluorochromes and biotin, and also the methods that are available for visualizing antibodies once they have been labelled. These methods include electron and light microscopy, as well as two types of ELISA. Although there is some overlap in the introduction and methodology between these chapters, the methods described are comprehensive. What may be lacking is a consideration of the advantages and disadvantages of particular labels with regard to specific applications, but again, enough choice and detail is given so that the reader can pick and choose their own solution.

The identification of antigens and epitopes that are recognized by antibodies is clearly a technique of interest to not only those who use antibodies as reagents but also to those who are engaged in vaccine design. Chapters 17 and 18 describe methods of antigen identification using immunoblotting and epitope mapping using phage display. Chapter 20 describes a method that is useful in antigen identification using immune capture of virus as an example. This technique is particularly useful for viruses, such as hepatitis C, which cannot be cultured *in vitro*. The methods of antigen identification presented in this book are not comprehensive, but there is a companion volume in this series, *Epitope Mapping Protocols*, which describes 30 methods of epitope mapping.

Antibodies have been used for decades for the purification of analytes from complex mixtures in the form of solid phase or immunoabsorbent columns, and more recently for the

enrichment of cells from heterogeneous populations. These techniques are described in Chapters 19, 21 and 22, but given the extensive use to which these techniques are applied these days, the treatments are somewhat short.

Each chapter in this laboratory manual is provided with plenty of references, but in some instances there are too many, and many are out of date. Nevertheless, the book provides easy to follow methods and often copious notes on the variations of the methodologies. Although the title of the current volume may be construed by some as pertaining to antibody methodologies only, the absence of antigen and epitope mapping techniques for T cells is conspicuous.

In summary, *Immunochemical Protocols* contains a wide selection of material in the field of immunochemical protocols and is aimed at those who would use antibodies as tools for detecting and locating antigens. The detailed protocols included are useful guides to those who wish to work with antibodies and can be readily adapted for practical use in the laboratory. This is by design a technical book and requires that the reader is familiar with aspects of molecular biology, immunology and biochemistry. It belongs on the shelf of any laboratory engaged in study of the humoral immune response.

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INVESTIGATIVE IMMUNOTOXICOLOGY

Edited by Helen Tryphonas, Michael Fournier, Barry R Blakely, Judit EG Smits and Pauline Brousseau, CRC Press, Boca Raton, FL, USA, 2005. 458 pages. ISBN 0-415-30854-2. Price: US\$149.95.

A decade ago, the most efficient way to gain an overview of an area of investigation and to explore detail of interest was often to read a book. Now that database searching is ubiquitous and institutional libraries provide access to large collections of online journals, the role of the scientific monograph is rapidly changing. However, in a newly emerging sub-discipline such as immunotoxicology, the published literature is still relatively sparse: a PubMed search for the term retrieves only some 300 items, although it does include some two dozen recent (2002 and later) reviews. Offering a compendium of research activity may therefore still be useful, and in large part this is what *Investigative Immunotoxicology* sets out to do.

The digital revolution notwithstanding, among the enduring advantages of a well-written scientific book are that it provides insights from experienced investigators in the field; that it can offer a behind-the-scenes view of current research,

in the context of all those negative data that never do get published in peer-reviewed journals; and that it may inspire the reader to delve into an area of investigation tangential to his or her current interests, or even to attempt something completely novel. Unfortunately, this book does not fare well in terms of inspiration. Its opening chapters are dry, dull, and dense with text. Having got these out of the way, the reader is offered three substantial sections dealing with immunotoxicology as it affects the ecosystem, immunotoxicity of chemicals for humans, and chemical allergens.

The first of these sections is not particularly exciting, although it does include intriguing chapters on how immunotoxic agents affect bivalves and fish, and a well-written overview of immunotoxicology in terrestrial wildlife.

Things improve considerably in the next section: among other worthwhile chapters, this includes a critical review of the predictive value of immunotoxicological studies, an excellent discussion of primate models for assessing immunotoxicity, and a thoughtful, up-to-date review of practical considerations in assessing pathological changes in organs of the immune system following exposure to toxic agents. The section on allergy contains some useful reviews of models and methods of assessing potential allergenicity, plus a somewhat tangential chapter on approaches to identifying immunogenic epitopes. Then follow three chapters that seem to have only a tenuous relationship to the main theme of immunotoxicology: one on animal models of autoimmunity, one mostly about the technology of transgenic animals, and one on applications of genomics. Although quite well written, these chapters are best regarded as generic reviews of their respective topics, which just happened to find their way into the book.

The final section of this monograph is one of the most interesting, with the various chapters providing worthwhile perspectives on the usefulness of biomarkers in assessing risk, the relevance of immunotoxicological studies to human health and/or the health of the ecosystem, interlaboratory variability of assays as well as approaches to dealing with the problem, and some relevant statistical issues.

Thus there are clearly several chapters (or even entire sections) in this book that are valuable and informative, and it does quite well in terms of providing an overview of current investigative activity. However, the numerous weaker chapters detract considerably from the remainder of the text. The book also suffers from an uneven standard of editing and there is much redundancy. Is the whole greater than the sum of its parts? I would say not and would be hesitant to recommend it for individual purchase. Nevertheless, investigators active in the field of immunotoxicology would certainly appreciate having a copy of this book available in their institutional library.

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From: Methods in Molecular Biology, Vol. 115: Immunocytochemical Methods and Protocols Edited by: L. C. Javois © Humana Press Inc., Totowa, NJ. 3. 4 Mao, Javois, and Kent. Methods Enzymol. 34, 723-731. 17. Clausen, J. (1981) Immunochemical techniques for the identification and estimation of macromolecules, in Laboratory Techniques in Biochemistry and Molecular Biology, vol. 1, pt. 3 (Work, T. S. and Work, E., eds.), Elsevier, Amsterdam, pp. 52-155. 10 Mao, Javois, and Kent. The protocols follow the successful Methods in Molecular Biology series format, each offering step-by-step laboratory instructions, an introduction outlining the principle behind the technique, lists of the necessary equipment and reagents, and tips on troubleshooting and avoiding known pitfalls. Up-to-date and highly practical, Immunochemical Protocols, Third Edition, takes both novice and experienced researchers from project initiation to final test format with a broad array of protocols suited to immediate use in the laboratory, as well as methods that can be successfully applied to entire Methods in Molecular Biology is a book series published by Humana Press (an imprint of Springer Science+Business Media) that covers molecular biology research methods and protocols. The book series was introduced by series editor John M. Walker in 1983 and provides step-by-step instructions for carrying out experiments in a research lab. As of January 2020, more than 2000 volumes had been published in the series. The protocols are also available online in SpringerLink, and were previously in Springer In book: Methods in Molecular Biology. Chapter: Large-Scale Integration of MicroRNA and Gene Expression Data for Identification of Enriched MicroRNA-mRNA Associations in Biological Systems. Publisher: Springer. Editors: John M. Walker School of Life Sciences University of Hertfordshire Hatfield, Silvia Monticelli Institute for Research in Biomedicine Bellinzona Switzerland. Authors: Preethi H. Gunaratne. Preethi H. Gunaratne.