

Book Reviews

IMMUNOLOGY, INFECTION, AND IMMUNITY

Edited by Gerald B Pier, Jeffrey B Lyczak and Lee M Wetzler, American Society for Microbiology Press, Washington, DC, 2004. 718 pages with colour illustrations and index. Price: US\$79.95. ISBN 1-55581-246-5.

The field of immunology was born from the study of pathogenesis and prevention of infectious disease. It started with variolation (inhalation of powdered crusts from smallpox lesions), which was practised by the Chinese, Indians, Japanese and Turks long before Edward Jenner used cowpox virus instead of variola virus for the same purpose. However, Jenner's experiments are believed to mark the beginnings of modern immunology, because he was the first to apply the scientific method.

The immune system has evolved to fight infection, and the response to microbial infection involves the activation of a complex network in which numerous cell types, soluble factors and adhesion molecules of the host immune system participate. It is therefore not possible to produce a good textbook in immunology without any reference to infection or infectious agents. *Immunology, Infection, and Immunity* has been produced with this in mind, and the Editors have clearly done this with an appreciation of the immune system as a defence system. While the emphasis of the book is on immunity to infectious diseases, it also includes diseases that arise as a result of inactivity or hyperactivity on the part of the immune system. Immunodeficiency, hypersensitivity and autoimmunity are outcomes when the immune system fails to act or over-reacts.

The Editors of *Immunology, Infection, and Immunity* are themselves active researchers and teachers of immunology. The way this book is structured attests to the insight and level of thought that has obviously gone into its production. The sections are logically divided, each with three to six chapters. The use of experimental data, wherever possible, to illustrate how the immune system operates is a plus. In addition, basic and applied aspects of immunology have been presented and integrated well. In some instances, a discussion of the basic immunological process is followed by its potential function in disease. Each chapter has a summary and a list of suggested reading, which graduate and postgraduate students will find useful. The teaching of immunology is generally made easier with good and simple illustrations and figures. The colour illustrations and figures in this book are indeed very good and presented very carefully.

There are six sections in this book. The first section, 'Function and composition of the immune system', consists of five chapters. These chapters deal with an overview of the immune system, innate immunity, complement, and cells, organs and tissues of the immune system. The second section consists of four chapters, which cover various aspects of antibodies, including genetics and diversity, antigenicity and immunogenicity, and antibody-antigen reactions. The next four chapters cover aspects of cellular immunity. The major histocompatibility complex, antigen processing and presentation, the T-cell receptor, T-cell activation and maturation,

and cellular communication are the five major topics, each covered in individual chapters.

Section IV – 'Immunologic effector systems and immunity to infection' – forms the major part of the book and consists of six chapters. Two of these chapters are dedicated to describing cell-mediated immunity and mucosal immunity. One chapter covers immunity to bacteria, one covers immunity to viruses, and one is dedicated to parasitic and fungal infections. Quite appropriately, the sixth chapter in this section is on vaccines and vaccination, and essentially concludes the section on immunity to infectious agents.

Aspects of immune system dysfunction are covered in the next two sections. Section V focuses on immunodeficiencies and consists of three chapters, covering primary and acquired immunodeficiencies, and cancer. The next section is on hypereactivity of the immune system. There is a chapter on hypersensitivity, one that covers autoimmunity and disease and, finally, one chapter on transplantation immunology.

The inclusion of the appendices is to be commended. Appendix A is a list of CD antigens (however, there is no description of what 'CD' is). Because many of these antigens were first known by other names, the addition of Appendix B, which is a list of antigens with CD designation equivalents, is welcome. Appendix C contains a current list of cytokines, chemokines and their receptors. Appendix D is a short list of cell types of the immune system and their functions. Last but not least is Appendix E, which lists a 'Historical timeline of immunology'. This is an important and useful addition, particularly for students, and allows one to appreciate how the field has evolved to be what it is today. What is clearly lacking here, however, is mention of the discovery of MHC restriction of T-cell recognition, which was awarded the Nobel Prize for Medicine in 1996.

While mainly intended for graduate students, we believe that this book will be useful as a reading source and general reference textbook for undergraduates as well. It will also be valuable to clinicians, junior (and perhaps even senior) active researchers who are interested in immunology of infectious diseases and finally, of course, to teachers of immunology. On the topic of host-pathogen interactions and integrated presentation of different components of the host immune system, *Immunology, Infection, and Immunity* and another American Society for Microbiology publication, *Immunology of Infectious Diseases*, along with *Mim's Pathogenesis of Infectious Diseases* are perhaps the few textbooks that stand out. We strongly recommend *Immunology, Infection, and Immunity*.

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