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BOOK REVIEW*

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"Pathology-General Changes" was first edited in 1979 under the sponsoring of WK Kellogg Foundation. The book was part of a collaborative project between four Departments of Pathology of Medical Schools belonging to major Universities in Brazil, namely Federal University of Bahia, Salvador (Service of Prof. Zilton de Andrade), Federal University Fluminense (UFF) at the city of Niteroi, Rio de Janeiro (Service of Prof. Manuel Barretto Netto), São Paulo University (USP) at the city of São Paulo (Service of Prof. Thales de Brito) and University of the State of São Paulo (UNESP) at the city of Botucatu (Service of Prof. Mario R. Montenegro).

In addition to the book, the project included several other educational tools such as sets of microscopic slides and kodachromes, and scholarships to teachers of pathology to be trained in any of the four collaborative centers.

The project was conceived to prepare qualified and updated teachers of pathology to attend the great demand for these professionals since General Pathology was considered by the Federal Education Council as a mandatory disciplin in the curriculum of all health related courses in Brazil, including, among others, medicine, veterinary medicine, dentistry, nursing, nutrition, phonoaudiology, biomedicine.

After the first edition, two new editions were released, the latest in 1992. Since the field of General Pathology has accumulated an enormous amount of new information and the book was very well received by students and teachers, and was sold out, we thought that was time for a new edition.

This 4th edition has incorporated most of the new knowledge available on the field and has maintained the same essential features of the book, namely clearness, accessibility and low price.

The chapters, written by 17 collaborators, are as follows: The normal cell; Relationship between cellular physiology and pathology, Reversible and irreversible cellular changes; Pathologic pigmentation; Circulatory changes; Inflammation, acute and chronic; Repair; Granulomatous inflammation; Immunopathology; Genetic changes; Changes in cellular growth and differentiation; Carcinogenesis; Neoplasms; Nutritional diseases; Methods applied in Pathology.

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* This book is available at the Library of the Instituto de Medicina Tropical de São Paulo.

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BOOK REVIEW*

ANNUAL REVIEW OF IMMNUNOLOGY, vol. 17, 1999; edited by William E. Paul, C.Garrison Fathman & Laurie H. Glimcher. Palo Alto, Annual Reviews Inc., 1999. 1031p.
ISBN: 0-8243-3017-X; ISSN: 0732-0582

The area of **Lymphocyte Surface Antigens and Activation Mechanisms** are examined in eleven chapters. **J.L. CLEMENTS** *et al.* discuss as adapter proteins, molecules with modular domains capable of recruiting additional proteins but that exhibit no intrinsic enzymatic activity, serve to couple proximal biochemical events initiated by T cell receptor (TCR) ligation with more distal signaling pathways. **C.T. KUO & J.M. LEIDEN** summarize current understanding of the transcriptional regulation of T cell development and function, with particular emphasis on insights derived from recent gene targeting and transgenic experiments. In the area of dynamics of T cell receptor signaling, **R.N. GERMAIN & I. STEFANOVÁ** analyze characteristics of TCR structure and ligand diversity, focusing on new relevant details of ligand-receptor interaction. T cell ontogeny is characterized by the ordered expression of several surface molecules, including the coreceptors CD4 and CD8. Advances in gene technology have allowed the manipulation of molecular interaction that shape the T cell repertoire. **E. SEBZDA** *et al.* focus on interactions during thymocyte maturation that define the T cell receptors, with an emphasis placed on current literature within this field. During T cell development within the thymus, CD4+ and CD8+ single-positive thymocytes arise from common progenitor double - positive cells that express both CD4 and CD8, during a process known as positive selection. **W. ELLMEIER** *et al*. analyze recent progress that has been made toward an understanding of how CD4 and CD8 gene expression is regulated. The transmembrane receptors Notch and their ligands are expressed in mammalian thymus, raising the possibility that Notch signaling could regulate T cell fate decisions. There are some indications that Notch activity normally acts to direct CD4+CD8+ precursors to the CD8+ lineage, and that recognition of Class I or II MHC might regulate Notch signaling. Possible models for the regulation of Notch by MHC regulation during CD4+ versus CD8+ lineage determination are discussed by **E. ROBEY** in a very interesting issue. T cell activation by superantigens (SAG) requires simultaneous interaction of the SAG with the Vb domain of the TCR and with MHC Class II molecules on the surface of an antigen–presenting cell. In a excellent review, **H. LI** *et al.* focus on biological effects of bacterial and viral SAGs, and discuss the affinity and kinetics of TCR and MHC binding to these molecules. In a very didactic manner, the authors describe the three-dimensional structures of MHC-SAG and TCR b chain-SAG complexes, and discuss how SAGs stimulate T cells expressing TCR b chain from a number of different families, resulting in polyclonal T cell activation. · In the field of B cell activation**, T. KUROSAKI** analyses the function of B cell receptor component (BCR), and summarizes the major advances made in defining the functions of cytoplasmatic signal transduction molecules and cell surface regulatory proteins that amplify or dampen signals during B cell development. **Y.X. FU & D.D. CHAPLIN** focus on studies defining recently identified crucial signals for the biogenesis of secundary lymphoid organs and for the maintenance of their proper micro-architecture. New insights into how the structure of these tissues supports effective immune responses are also discussed. Apoptotic cell death plays a central role in shaping the repertoire of circulating mature lymphocytes. In contrast to necrosis, apoptosis is an orderly process that preceeds through several morphological phases. Recent evidence has indicated that healthy cells require the caspase family of cysteine proteases activation to undergo cell death. In contrast, in cells that are irreversibly neglected or damage, death occurs even in the absence of caspase. Current understanding of these two pathways of cell death in the immune system is summarized by **J.C. RATHMELL & C.B. THOMPSON.** In the case of T cells, apoptosis occurs in at least two major forms: antigen-driven and lymphokine withdrawal. The former mechanism is mediated by the expression of death cytokines such as FasL and TNF that engage specific receptors that assemble caspase-activating protein complexes. **M. LENARDO** *et al*. review the immune physiology of mature T cell apoptosis and the two pathways of activated T cell apoptosis in a very didatic manner. Antigen-induced apoptosis as a therapeutic approach for T-cell mediated diseases such as autoimmune diseases, allograft rejection, and allergies is also analyzed.

Much information has been obtained on the area of **Immuno-deficiency**. Although it is known that NK cells can respond to infections with a number of different classes of agents, the best evidence for their importance in defense is with virus. In a very interesting issue, **C.A. BIRON** *et al.* review the major functions for NK cells and the pathways regulating them during viral infections. The authors focus on unique or dominant characteristics potentially distinguishing infections with virus from those with bacteria and parasites. In order to initiate the immune response, macrophages have evolved a restricted number of phagocytic receptors that recognize conserved motifs on pathogens. Pathogens are also phagocytosed by complement receptors after opsonization with complement and by Fc receptors after specific opsonization with antibodies. In a very up-to-date chapter, **A. ADEREM & D.M. UNDERHILL** analyze important differences in the molecular mechanisms underlying phagocytosis by different receptors, such as differences in the cytoskeletal elements that mediate ingestion, differences in vacuole maturation, and differences in inflammatory responses. In addition to above receptors, the authors discuss CD14, a molecule also known to transduce LPS signals, and that has been implicated in

* This book is available at the Library of the Instituto de Medicina Tropical de São Paulo.

recognition and internalization of apoptotic cells. The Wiskott-Aldrich Syndrome (WAS), a rare X-linked primary immunodeficiency, includes a wide spectrum of abnormalities ranging from mild isolated thrombocytopenia to a life-threatening immunodeficiency with recurrent infections, malignancies, and autoimmune disease. **S.B. SNAPPER & F.S. ROSEN** review the role of the defective protein, the Wiskott-Aldrich Syndrome Protein (WASP), in the physiopathology of the disease, and its roles in signaling and cytoskeletal organization. In the field of infectious diseases, **A.T. HAASE** reviews the natural history of HIV-1 infection and encouraging results with highly active antiretroviral therapy (HAART). The chapter is foccused largely on lymphatic tissues because virus is produced and stored on follicular dendritic cells in a dynamic process that slowly depletes CD4+ Tcell, setting the stage for AIDS. The chemokine receptors CXCR4 and CCR5 have been identified as the principal coreceptors for T cell line-tropic and macrophage-tropic HIV-1 isolates, respectively. In a didatic and up-to-date issue, the role of coreceptors in HIV-transmission and pathogenesis of AIDS. The importance of an inactivating mutation in the CCR5 gene which, in homozygous form, confers strong resistance to HIV-1 infection, is also discussed. Finally, the authors analyze current coreceptors-based therapeutic strategies to combat the AIDS epidemic. In extrinsic asthma, the inflammatory process is thought to arises as a result of inappropriate immune responses to commonly inhaled allergens. It has recently become appreciated that as orchestrators of the inflammatory response, T lymphocytes, in particular CD4+ T cells, play a pivotal role in the pathogenesis of asthma. **M. WILLS-KARP** reviews our current understanding of the pathophysiologic mechanisms by which Th2 cytokines induce airway disease, and the factors that predispose to the generation of these pathogenic cells in response to inhalation of ubiquitous aero-allergens.· Over the last ten years, a number of important findings have dramatically improved our understanding of the high affinity receptor for IgE (FceRI) biological functions**. J.P. KINET** summarizes recent progress in understanding specific aspects of FceRI biology and biochemistry. Some important topics include the following: the genetic demonstration that FceRI can alter the disease evolution of some parasitic diseases; the possible association between various human FceRIb chain polymorphisms and atopic phenotypes; and the possibility that the FceRIa chain may be target of autoantibodies in chronic urticaria.· The crystal structure of the human FceRIa is reviewed by **S.C. GARMAN**.

Three chapters in this volume deal with **Regulation of Immune Response**. **T. A. WALDMANN** focuses on the structure and genomic architecture of IL-15, its receptors and signal transduction pathways. In this issue, the role of IL-15 in NK cell differentiation, in host response to intracellular pathogens, and in inflammatory autoimmune diseases, retroviral diseases, and neoplasia are also analyzed. Recent progress in the field of the signaling mechanisms of the TNF/Fas systems are reviewed by **D. WALLACH** *et al.* Alongside principles of signaling shared with other pathways, features are emerging that are unique to the signaling for death of the cells and to the functioning of the TNF receptor family in general. As cited by the authors, the various references listed are mostly the more recent and lesser-known studies, and readers are referred to other recent reviews for more detailed information and references. **K. NELMS** *et al.* summarize recent progress concerning many aspects of the structure and function of the IL-4 receptor, with particular emphasis on the biochemical mechanisms through which it transmits signals.

As cited by **J.W. YEWDELL & J.R. BENNINK** in their excellent chapter, of the many thousands of peptides encoded by a complex foreign antigen that can potentially be presented to CD8+ T cells, only a small fraction induce measurable responses in association with any given MHC class I allele. Recent progress in unravelling the molecular and cellular basis for this phenomenon, known as immunodominance, are reviewed in a very didactic manner. The discovery of nonpeptide lipid and glycolipid antigen recognition by CD1-restricted T cell defines a new paradigm for immune recognition and provides a novel mechanism for host responses to infectious agents such as *M. tuberculosis and M. leprae.* **S.A. PORCELLI & R.L MODLIN** analyze recent progress in this field that have begun to clarify the molecular and cellular mechanisms enabling the presentation of lipid antigens by CD1 proteins, and their subsequent effects on T response. Finally, **K.L. ROCK & A.L. GOLDBERG** focus on recent discoveries about the proteolytic systems that degrade cell proteins and the generation of MHC class I - presented peptides.

Although TCR recognition of peptide-MHC (pMHC) is functionally analogous to the antibody-antigen interaction in the humoral system, T cell recognition is a more complex process from a genetic, structural, and biological standpoint. Furthermore, the TCR does not bind to pMHC in isolation, but as part of a multicomponent signaling process that includes the CD3 chains, and coreceptors CD8 or CD4. **K.C. GARCIA** *et al.* cover the recent exciting progress in structural immunology that has stemmed from the X-ray crystallographic analyses of TCRs, TCR/pMHC and coreceptor complexes. **E.A. LONG** reviews as rhe inhibitory-receptor superfamily (IRS), that includes a expanding group of receptors, appears to regulate many types of immune responses by blocking cellular activation signals. Finally, in a very interesting chapter, **G.W.LITMAN** *et al.* review issues related to the evolution of the complex multigene families of antigen binding receptors that function in adaptative immunity.

The volume 17 of the **Annual Review of Immunology** offers a broad of recent information on selected topics in Basic Immunology. Like other volumes of this scientific series, this book is mostly targeted to postgraduates and researchers which wish to bring themselves up to date on Basic Immunology.

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