

publishers and other sources, no explanation of initials of societies etc; these are worldwide failings. I am sure that VHAJ would help workers who wanted to follow such articles. The book is beautifully produced and pleasingly free of errors, although I am puzzled by a figure on p. 271 from a UNICEF publication with no explanation. This book deserves the widest circulation not only in India, but also among health workers and well wishers everywhere.

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The structure, function and genetic regulation of diverse cell surface receptors which are responsible for the fledgling interactions of various cells and molecules of the immune system constitute an area of intense research these days. No wonder this volume incorporates five reviews devoted to this subject. There are three reviews each on HLA/MHC and T lymphocytes, two each on B lymphocytes and interleukins, and one each on regulation of lymphocyte function by protein phosphorylation, defensins, immunity to intracellular bacteria, immunological memory, auto-antibodies, antigen processing and presentation, dominance and crypticity of T cell antigenic determinants, molecular basis of allorecognition, gene therapy of immune system and development of malaria vaccine.

It has been known for sometime that interaction of antigenic peptide - MHC complex with T cell receptor (TCR) alone is insufficient to trigger an optimal immune response and some costimulatory signals are mandatory. It is in this context that Linsley and Ledbetter discuss the interaction of CD28, a T cell molecule, with B7 molecule present on the antigen presenting cells (APC). The

antigen-specific interaction between T cells and APC triggers the expression of interleukin-2 and its homologous receptor (IL-2R). Minami *et al.* give molecular structure of IL-2R describing, in detail, various functional domains of IL-2R β , the subunit which plays the most critical role in interleukin-2 signal transduction. The linking of IL-2R β with intracellular signaling pathways that mediate induction of nuclear proto-oncogenes has also been discussed. Leiden while reviewing regulation of TCR gene expression by T-cell specific transcriptional factors emphasizes the need to study several yet unidentified factors, evidences for the existence of which are nevertheless there, to fully understand the underlying molecular mechanisms. The review by Yokoyama and Seaman on structure and genetics (NK gene complex) of lectin-like receptors present on the surface of natural killer (NK) cells will be of interest to many immunologists. Discussion on the possible mechanisms by which these receptors, namely rat NKR-P₁ and mouse Ly-49, mediate stimulatory/inhibitory functions of NK cells though still postulatory represents a substantial leap in our understanding of the functioning of NK cells.

Although not entirely under the ambit of classical receptor-ligand interactions of the cells of immune system, endothelial-leukocyte adhesion has recently emerged as an area of no less importance. Bevilacqua presents a detailed account of selectin (E,P,L)-carbohydrate and ICAM-integrin interactions. The possibility of LFA-3 and MHC molecules contributing to such interactions has been probed. The roles of endothelial-leukocyte adhesion molecules in acute inflammatory processes and tumor cell metastasis have been dealt with briefly.

In an extremely interesting and entertaining prefatory chapter titled 'HLA and I', van Rood of University Hospital, Leiden gives a vivid account of the development of the field of HLA and brings out complementary roles the clinic and the laboratory played in making major breakthroughs in this area. An intellectually satisfying review on molecular descent of *Mhc* by Jan Klein *et al.* will be of much interest to evolutionary biologists especially molecular population geneticists. The remarkable reasoning by which the authors refute the commonly held views of the evolu-

tion of *Mhc* makes a fascinating reading. Remmensee *et al.* describe in detail the nature of the peptides and the mechanism by which these are presented by MHC Class I molecules. Its significance for immunity as well as for self-tolerance has been discussed.

Further insights into the development and functioning of T cells have recently been obtained. Fitch *et al.* discuss several regulatory influences that differently affect murine T lymphocyte subsets especially T_{H1} and T_{H2}. T cell-dependent B-cell activation has been described by Parker with particular emphasis on contact dependent help provided by T cells to B cells. This has been discussed in view of the identification of a ligand which is strictly restricted in expression to CD4⁺ T cells and binds to CD40, a B-cell differentiation antigen. Wenar Haas *et al.* discuss specificity of γ/δ T cells and cite several observations which support the possibility of their role in host defence against infectious diseases, graft rejection and immunodeficiency disorders. The author suggests that studies on the interaction of γ/δ T cells with different APC (which utilize different antigen-presenting molecules and reside in different tissues) hold the key to unravelling the mystery of γ/δ T cells.

B lymphocytes, hitherto considered relatively simpler, have sprung some major surprises in recent years. Kantor and Herzenberg present substantial evidence to show that B-Ia, B-Ib and conventional B cell subsets appear sequentially during development and arise from separate progenitors thus representing separate lineages. This means the 'single progenitor' hypothesis is no more held sacrosanct. Harriman *et al.* discuss various models that have been proposed to explain molecular mechanisms underlying immunoglobulin class switch. Class switching without DNA recombination and effected by alternative splicing of long nuclear RNA/trans-splicing has been discussed briefly.

Of late an increasing number of investigators are getting involved in unravelling the physiology of lymphocyte responses and in this regard protein phosphorylation seems to be in the eye of the storm. The detailed review (340 refs) by Perlmutter *et al.* on this subject is an inventory of protein kinases and phosphatases for which evidence

supporting a role in lymphocyte signaling exists. Some novel lines of enquiry, including the use of infectious agents (*Yersinia. Theileria parva*) and their products (*Bordetella pertussis* exotoxin), which may help elucidate how transmembrane signaling is linked to intracellular regulatory molecules have been suggested.

Of the several lymphokines reported till date interferon- γ (IFN- γ) and interleukin-10 (IL-10) seem to have taken a kind of lead in paracrine versatility. Farrar and Schreiber review recent developments about the role of IFN- γ in host defence, inflammation and autoimmunity. Structure of IFN- γ receptor, its dimerization following interaction with the ligand and proposed pathways of signal transduction have been discussed in detail. The review is concluded with the optimism that further research on IFN- γ would help realise protein's full therapeutic potential. Moore *et al.* describe structure of IL-10, its homology to a region of Epstein-Barr virus genome, spectrum of its *in vitro* and *in vivo* activities and possible role in immune and inflammatory responses. Such potential clinical applications of IL-10 as suppression of T cell-mediated autoimmune diseases and averting allograft rejection have been discussed.

There are two reviews which microbiologists will find particularly interesting. Lehrer *et al.* discuss 'defensins' – a newly delineated group of antimicrobial and cytotoxic peptides from mammalian cells. Though discovered thirty years ago as 'basic cationic proteins', it is only in the past few years that their biochemistry and molecular biology,

detailed in this review, have been worked out. In the other review, using human tuberculosis and murine listeriosis as paradigms, Kaufmann highlights the roles played by interleukins, and α/β and γ/δ T lymphocytes in the complex gamut of a host's immune response to intracellular bacteria.

Lately there has been a resurgence of interest in immunological memory. Gray reviews data on memory markers, sites of production, activation requirements and life spans of both the B and T memory cells and highlights several unresolved problems. A clear lesson from the review: immunological memory is much more complex than thought earlier.

Naparstek and Plotz classify autoantibodies and present an exhaustive and highly absorbing review of their role in autoimmune diseases. Some very unusual actions of autoantibodies reported recently have been discussed briefly.

Germain and Margulies give a highly descriptive and lucid account of the biochemistry and cell biology of antigen processing and presentation highlighting the importance of conformational changes accompanying peptide binding to MHC molecules. Various factors which determine the dominance and crypticity of T cell antigenic determinants have been discussed by Sercarz *et al.* The impact of this differential display of determinants on tolerance and autoimmunity has also been reviewed.

Allorecognition has been one of the most perplexing issues of immunology and molecular basis of this highly potent immune response has eluded immunologists. The review by Sherman and Chattopadhyay, however, almost

demystifies allorecognition. The emphasis of the review is on the polymorphic residues located within the peptide binding groove of MHC molecules and their pivotal role in generating high frequency of alloreactive cells in histoincompatible individuals.

In an extremely state-of-the-art review Cournoyer and Caskey summarize recent progress, both experimental and clinical, in the application of gene therapy to various disorders of the immune system viz., ADA, PNP and leukocyte adhesion deficiencies, CGD, other X-linked immunodeficiencies (XLA, XSCID) and AIDS. A brief discussion on various gene therapy strategies against cancer has been included.

Every strategy aimed at immune intervention of malaria has seen its ups and downs. Nardin and Nussenzweig reevaluate, in the light of the newer information, earlier concepts and predictions about the suitability of circumsporozoite (CS) protein for vaccine development and review recent data on the molecular basis of sporozoite-liver cell interaction, non-CS sporozoite antigens and liver stage antigens which may provide newer targets for immune intervention of malaria. Recent experimental approaches such as multiple protective epitopes, recombinant live vectors and novel adjuvants are considered in the development of more effective malaria vaccine formulations.

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