

tive selection of T cells in the thymus.

Robey and Fowlkes in their article 'Selective events in T cell development' describe the regulatory influences of α and β TCR gene rearrangements and the role of peptide antigen on events occurring during thymic T cell development. Positive and negative selection events have been interpreted using affinity models for TCR-antigen interactions. Knock-out mice obtained by gene targeting methods have not only revolutionized immunology but have also provided decisive answers to many unanswered questions on lymphocyte ontogeny and development. All genes, including cytokine genes targeted to examine events during thymic T cell development as well as their effects on peripheral T cell functions, have been excellently reviewed by Pfeffer and Mak. Continuing on this topic, confirmation that the thymus is not the only site for T cell education should be greatly interesting. Poussier and Julius describe evidences indicating that the intestinal epithelium is also a primary lymphoid organ which, like the thymus, supports T cell lymphopoiesis and differentiation but not without differences.

The powerful impact of transmembrane signalling and protein phosphorylation events in modern biology is again reflected by the inclusion of three full articles devoted to this subject. The involvement of Src-family kinases Lck and Fyn as well as of the Syk-family kinase ZAP-70 and the role of common peptide sequences called ARAM in TCR-mediated signalling are described by Chan, while the structure-function analyses of the CD45 antigen, its wide role as a tyrosine phosphatase-regulating Src-tyrosine kinase during the activation of T cells and other haematopoietic cells are detailed by Trowbridge. In addition, transmembrane signalling events seem to share common features even in B cells. While describing the structural and molecular features of the B cell receptor (BCR) complex, Cambier *et al.* consider the role of Lck, Fyn and other cytoplasmic effector molecules during antigen-BCR-induced signalling. A general model for signalling in B cells is presented. Binding between cell surface CD40 and its ligand is another interaction that has been shown to play a critical role during antigen-induced B cell proliferation, formation of memory B cells and B cell development in lymph nodes. All these aspects and the role of follicular

dendritic cells, centrocytes and centroblasts in antibody production are found in separate articles entitled 'Germinal centres' and 'CD40 antigen and its ligand'.

Six different articles deal with the general area of antigen-driven interactions and antigen binding. They discuss (i) the identification and characterization of crucial structural features needed for peptide-antigen binding to MHC class I and II molecules, (ii) antigen presentation by Class I-B molecules, (iii) target antigen recognition and mechanisms of lymphocyte-mediated cytotoxicity, (iv) antigen selection of anti-DNA antibodies, (v) assembly and transport of MHC class II molecules and (vi) peptide-antigen-mediated TCR antagonism. To emphasize some points, assembly of MHC class II structures requires the participation of the invariant chain and other chaperones, finally leading to the transport of the complex to the cell surface through the golgi apparatus via late endosomal compartments. Cresswell elucidates the role of the proteasome complex and transport proteins TAP-1 and TAP-2 in the generation and transport of peptides from protein antigens. The understanding of peptide residues critical for binding to MHC and recognition by the TCR has led to the discovery of TCR antagonism according to Sette *et al.* This is increasingly being used in attempts to inhibit T cell responses during inflammation and autoimmune situations.

Regulating the balance between Th1- and Th2-type helper T cells is being recognized as a promising strategy to intervene therapeutically and alter the course of disease states. Since the lymphokines produced by these subsets can regulate Th1/Th2 balance and because antigens can preferentially activate one or other T helper subset in different animals, it is now considered important to account for the host genetic background while formulating approaches for disease control. All this and the differentiation of Th1/Th2-type cells from naive precursors as well as their cell surface markers are considered in two articles, one by Romagnani and another by Seder and Paul. Since the AIDS virus promotes the apoptotic cell death of Th1 cells, Cease and Berzofsky note that the next generation of synthetic peptide and recombinant vaccines will have to consider the immunobiology of AIDS infection. All currently

available AIDS vaccines are reviewed in their article.

Two other articles that may interest clinical immunologists would be 'Immunological aspects of allergic asthma' by Bochner *et al.* and the article on oral tolerance by Weiner *et al.* While the latter deals with the treatment of organ-specific autoimmune diseases by administering antigens orally to induce antigen-specific and nonspecific suppression, the former deals with the wide variety of immune reactions as well as the role of cytokines and adhesion molecules in allergic asthma. Another article of special interest is the review by Winter *et al.* that describes in detail the technique and utilization of filamentous bacteriophages to develop antibody reagents for research and therapy.

Thus, this volume, although not without occasional typesetting errors, reflects excellently the latest not only in new emerging areas but also updates several older topics as well.

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Volcanism: Radhakrishna Volume. K. V. Subbarao (ed.). Wiley Eastern Limited, 4835/24 Ansari Road, Daryaganj, New Delhi 110 002. 1994. 332 pp.

Basalts are the most voluminous rocks on the Earth forming the bulk of the oceanic crust. They are the most abundant rocks on the Moon and other terrestrial planets. The recent spate of studies on the lunar and oceanic rocks has brought in loads of new information on basalts. On the continent, the present attention is focussed on flood basalts such as those of Deccan, Siberia, Karoo and Columbia River. K. V. Subbarao of IIT, Bombay, along with his foreign collaborators has generated prodigious data on Deccan basalts and has now turned his attention to basalts in general. The present outstanding volume of edited papers is the outcome of this effort. The volume is dedicated to one of the most revered and celebrated geologists of our time, Padmashri B. P. Radhakrishna. BPR is not a mere luminary but an institution in himself and this valuable volume is a

fitting tribute to his self-effacing greatness.

The book commences with an excellent introduction to the basaltic rocks of the Moon, Mars and Venus by S. R. Taylor. Hekinian and Bideau introduce the readers to the submarine volcanics of the East Pacific Rise (EPR) and the formation of hydrothermal mineral deposits, which are actualistic analogues of Precambrian mineralization in greenstones.

Deccan volcanism occupies the pride of place in the volume. Subbarao and co-workers summarize the geochemical stratigraphy of the Nashik area. Sethna and Mousavi attribute subaqueous origin to silicic tuffs and relate them to the tectonics of Panvel flexure. Aniruddha De brings out the compositional variations in the basalts of Gujarat and Madhya Pradesh. Somdev Bhattacharji and co-workers identify the feeder dyke systems for basaltic flows and geochemically compare the dykes and flows. They invoke N-S lithospheric extension, rifting and dyke emplacement from a mantle plume. Gautam Sen and Tobi Cohen describe an intrusive complex from Satpura dome and suggest synchronicity of two active magma centres of the western Deccan and Satpura and consequent Reunion - Deccan plume head about 800 km in diameter.

The important role of mineral and melt inclusions in unravelling the genetic history of Deccan and Siberian basalts, par-

ticularly the giant plagioclase basalts, is brought out by Pankov and others. Experimental studies by Cohen and Sen on aphyric basalts at 6 kb pressure throw light on fractionation in a shallow chamber (< 15 km depth) for the source of Deccan lavas. Ramanan and Subbarao present a novel approach in developing software for REE modelling using equilibrium partial melting. Peter Hooper presents a comprehensive review on the chemical composition of the source material and petrogenetic processes responsible for the evolution of the four major continental flood basalt provinces of Karoo, Parana, Deccan and Columbia River. Ann Wilkins and co-workers provide a new insight into the genesis of the ubiquitous but controversial red bole beds and suggest a pyroclastic parent material for them.

Goles and Brandon present a detailed geochemical analysis of a part of the Columbia river volcanics and prove the case of contamination of parent magma, an example which will act as a guide in identifying the process of assimilation in other flood basalt provinces. Felix Chayes, who pioneered the development of igneous petrological database, together with Nagy, describes methods for recognition and correction of errors in data base. Daves proposes a new mechanism of plate motion related to Earth's tides which could cause lithospheric uplift. H. M.

Iyer lucidly introduces the principles and applications of seismic tomography for 3D modelling of earth's structure, with examples of tomographic imaging experiments carried out by the US Geological Survey. Rogers and Mauldin enlarge the earlier application of terrane concept to the Indian shield by BPR in 1989 and identify four terranes in southern India. Their flight of fancy visualizes peninsular India as a part of the larger block - the Archaean supercontinent 'Ur'.

BBD Power Press has done a creditable job of excellent printing with an appealing get-up. Mallya brothers of BBD Press are part and parcel of Geological Society, whose prime mover is BPR. Arun Inamdar's lovely sketches of BPR and Nashik scenery and Mike Widdonson's spectacular photograph of the Deccan Trap landscape adorning the jacket of the book, have made the volume very attractive. Subbarao's editorial work has been thorough. Wiley Eastern Ltd. scores full marks for publishing this lovely volume. Among the various volumes dedicated to the greatness of BPR, this book figures as one of the most memorable in the recent years.

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