New Strategies in Parasitology

The book comprises a series of papers and summaries of discussions by a group of 40 invited investigators of different disciplines in the field. These were presented at a meeting which concentrated on parasite infections that result in pronounced morbidity and mortality in man and domestic animals worldwide.

The African trypanosome is considered to exemplify the complexity and sophistication of host-parasite interactions at the cellular level. Genetic control mechanisms underlying the exchange of surface antigens (VSGs) by trypanosomes are explained, and a detailed description of how the VSGs are anchored to the trypanosome membrane is given. It is considered that potential drug and immunological targets might also be found among the cell-surface receptors now being described on these parasites.

Recent developments in the understanding of the immune system in relation to experimental leishmaniasis are described. Different patterns of cytokines are apparently produced by subsets of T-helper cells; therefore, the outcome of a parasitic infection is likely to depend on which of these two branches of the immune system is stimulated preferentially. Evidence is also given that antibodies to specific cytokines can be administered to infected animals as part of the regimen for clearing infection with leishmania. In considering general aspects of the control of leishmania infection, there is no agreement on whether promastigote or amastigote antigens would be used preferentially as protective antigens. However, it is considered that control of leishmaniasis in its visceral or cutaneous forms must be tailored to differing epidemiological circumstances in different places.

The development of vaccines is considered in several contributions, and the successful rapid empirical approach for cestode vaccines in veterinary practice is described, including production of a recombinant Taenia ovis vaccine. However, progress in the development of human-parasite vaccines is, by comparison, considered to be slow, although the logical approach generally made for further characterisation of antigens expressed during the hepatic stage of malaria parasite development, as potential immune targets for a vaccine. The development of a new mouse model for cerebral malaria is described, which implicates tumour necrosis factor (TNF or cachectin) in the pathogenesis of this complication of malaria. However, the validity of the P. berghei/mouse syndrome as a model for human cerebral malaria is questioned, the great complexity of the pathophysiological cascade in falciparum malaria being emphasised. The discussant also queries the relevance of the observations for the sequestration of parasitised erythrocytes in the placenta, particularly since this may not be associated with cerebral, or even severe, malaria. The importance of integrating new methods in therapy or control with established programmes is stressed.

The idiotype regulation of T-cell function by antibodies is described in schistosome infection, and is considered to be important in regulating the response of children exposed to maternal idiotype or anti-idiotype antibodies during fetal development, which might influence the response of the child to later infection. It is concluded from field studies that the slow acquisition of immunity to schistosomiasis with age appears to be attributable not to the slow development of appropriate protective responses, but rather to early rise and subsequent slow decline of inappropriate (blocking) antibodies that prevent the expression of the protective responses. These findings are discussed in the context of the anticipated use of recombinant vaccines in man.

The role of the plasma membrane in the parasite response to stress is described and utilised in relation to studies on Entamoeba histolytica. It is considered that further definition of these processes may identify key reactions which are susceptible as targets for the development of vaccines or more effective chemotherapy.

The interaction of peptides and the major histocompatibility complex is addressed. An understanding of the molecular basis of clonal expansion of this cell population provides a unique chance to modulate the response rationally, as required in vaccine immunisations and, by decreasing a deleterious population of T cells, in treating allergies or autoimmune syndromes.

Current research on opportunistic parasitic infections in relation to AIDS is described, including Pneumocystis carinii and Cryptosporidium, as well as the development of anticioccidial drugs that may be useful for the treatment of toxoplasma encephalitis. Strategies for the implementation of health care by targeting parasitic diseases are also discussed.

The constituent papers and discussions in this book, which is the second in the series “Frontiers of Infectious Diseases”, highlight the way in which discoveries at the cellular level advance our understanding of host-parasite relationships and the complex pathology and epidemiological diversity of parasitic infections. However, these recent advances in immunology, molecular biology and pharmacology require further development to produce effective agents for the prevention and treatment of the disease that continue to affect a large proportion of the world’s population. Nevertheless, this publication is an important record of much up-to-date research endeavour
which will be of interest and great value to workers in a variety of disciplines. It has been carefully edited, its presentations are well referenced and it contains a useful index.

G. WEBBE

Progress in Clinical Parasitology Vol. I

According to the editor's preface, this book is aimed at an American readership newly alerted to the importance of parasitic diseases by the seriousness of AIDS-related protozoal infections. This is to be the first in a series of monographs on clinical parasitology, produced to "bridge the gap between journals and textbooks by presenting comprehensive reviews soon after basic advances are made".

Volume I is a mixed bag of six diverse topics, three on protozoa and three on helminths. The chapters vary greatly in length, 14–46 pages, and subject matter—from a historical review of schistosomiasis control in China to an ultrastructural study of Cryptosporidium. The first two chapters are concerned with malaria. In the first of these W. A. Krotoski gives a scholarly, blow-by-blow account of the discovery of the hypnozoite stage in the malaria life-cycle. This important discovery, in which Dr Kroto-
ski played a leading part, led to an understanding of the cause of relapses in P. vivax and P. ovale malaria and an appreciation of the clinical and therapeutic implications.

The second chapter is a multi-author review by L. William Scheibel and collaborators on Ca\(^{2+}\)/calmodulin (CaM) functions in P. falciparum and their implications for drug design. Evidence for the importance of Ca\(^{2+}\) and CaM to malaria parasites is reviewed and this is followed by a discussion of the cause of relapses in P. vivax and P. ovale malaria and an appreciation of the clinical and therapeutic implications.

The final chapter, by Ribeiro and colleagues, is an electronmicroscope study of the developmental stages of Cryptosporidium as seen in a human duodenal biopsy. This type of study can provide important insights into the intractable nature of the infection in the immunocompromised host and suggest possible reasons for its great severity. For example, the lack of sensitivity of Cryptosporidium to drugs may be related to its demonstrated intracellular, extracytoplasmic localisation, and the occurrence of an apparently auto-infective type of oocyst may contribute to the persistence of the infection in the immunocompromised host.

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