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Malaria still represents, in spite of enormous effort to control, one of the most important parasitic diseases of humans world-wide. Currently, about 400 million people are infected, with 2-4 million (mostly children) dying annually, and about 40% of the world's population are at the risk of developing this devastating infection. Due to the rapid introduction of molecular biology methods into immunology and parasitology, an enormous amount of new results have been obtained in the last two decades. Many of these results are dealt within *Malaria Immunology*, which represents the 2nd edition of the book devoted to the immunity against this distinctive intracellular pathogen.

The book is composed of 19 chapters, arranged in four sections devoted to the biology and pathogenicity of the malaria parasite, malaria antigens, immune response to the pathogen and malaria vaccine development. The first chapter describes in detail the ultrastructure of each specific stage of the malaria parasite life cycle, and the morphological and functional changes of the host cells induced by the parasite. The text is supplemented with good-quality electron micrographs. The second chapter focuses on the analysis of the cell and molecular biology of the parasite, and its interactions with the mosquito vector, notably with its immune mechanisms. Interestingly, based on the background of parasite life cycle and mosquito immunity, possibilities for the future development of intervention strategies targeted to the mosquito stages of the parasite's life cycle are discussed. In the third chapter, the pathogenicity of the malaria parasite is associated with such mediators as various cytokines, reactive oxygen species and nitric oxide.

The following six chapters are devoted to malaria antigens and their implication for vaccine development. The immune response to the liver-stage parasite antigens is discussed in detail, highlighting the significance of the IFN- γ -inducible nitric oxide effector molecule. Molecular interactions between merozoite and the erythrocyte are described in terms of mechanisms of the invasion process. Cytoadherence of *Plasmodium falciparum*-infected erythrocytes is explained at the molecular level. The major parasite adhesion receptor, *P. falciparum* erythrocyte membrane protein 1, is presented as a highly polymorphic antigen encoded by the large family of *var* genes. The last chapter of this part deals with sexual and sporogonic stage antigens. Nine antigens are described in detail including their possible involvement in the transmission-blocking vaccines.

The section entitled "Malaria Infection: Immunity and Regulation" summarises the present knowledge of mechanisms of protective immunity against the malaria infection. In the first chapter of this section, a detailed analysis of the mechanisms of protective immunity to blood-stage infections is given based on the data from experimental mouse model. Of T lymphocytes, the major role in the control of blood-stage parasites is assigned to CD4⁺ T cells, which act as helper cells for B lymphocytes, enabling the production of protective antibodies, and which activate macrophages and other cells to

produce parasite-killing molecules through the release of inflammatory cytokines. Th1/Th2 dichotomy is of considerable significance for the outcome of the infection. Activation of the Th1 subpopulation in the early stages of infection correlates with protection. The protective role of other subsets of T lymphocytes, $\gamma\delta$ T cells and NKT lymphocytes is also documented. The function of some effector molecules like TNF- α or NO in either protection against malaria infection, or its pathology, is discussed. The results obtained in a mouse model are compared with those recorded in humans. The second chapter of this section focuses on the immune regulation of malaria blood-stage infection in human patients. In addition to humoral and cell-mediated adaptive immunity, including the role of cytokine network and nitric oxide, non-specific innate immunity represented by NK cells, NKT cells and $\gamma\delta$ T lymphocytes is also addressed.

Almost half of the book is devoted to malaria vaccines. It is the result of enormous effort to develop a safe and effective vaccine which will solve the problems of drug-resistant strains of the parasite and insecticide-resistant mosquito vectors. While the pre-erythrocytic malaria vaccines have been based on the circumsporozoite protein, various merozoite surface proteins have been proved to give some degree of protection in laboratory animal models. In comparison with asexual stage malaria vaccines, less has been done on the design and efficacy testing of transmission-blocking vaccines, which target the sexual stages of the parasite life cycle in the mosquito. The very promising area of DNA vaccines is oriented towards multistage vaccines comprising both the preerythrocytic and erythrocytic stage antigens and the heterologous prime/boost immune enhancement strategy.

Antidisease vaccines represent a special category of vaccines. The immune response elicited by these vaccines is not directed against the parasite itself, but against the parasite-derived molecules (toxins) causing the disease. This chapter identifies glycosylphosphatidylinositol as a malaria toxin. It is suggested that first promising results have been obtained in laboratory mice immunized with this glycolipid. The two last chapters solve the problems of suitable adjuvants in the malaria vaccine development, and discuss the requirements for an effective malaria vaccine. Description of different phases of vaccine evaluation and an overview of malaria vaccine trials are the subjects of the last chapter.

This interesting and well-written book represents the contribution of 42 well-recognised experts in the field of malaria immunology. It offers not only comprehensive information about the malaria parasite antigens, anti-malarial immunity and malaria vaccine candidates, but also broadens the understanding of immunity to infection in general. Therefore it is recommended not only to scientists working in malaria immunology, but also to all professionals in the fields of immunology, infection and vaccine development. Also, students of immunology and medicine can find here a valuable resource.

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