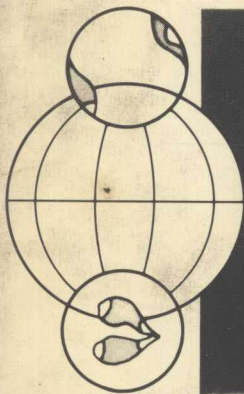


Malaria

JULIUS P. KREIER, editor



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***Immunology
and Immunization***

MALARIA

Volume 3

Immunology and Immunization

Edited by

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Preface

The last major effort to review our knowledge of malaria was by Mark F. Boyd whose "Malariology" published by W. B. Saunders of Philadelphia in 1949 is still a valuable resource. The exquisite volume "Malaria Parasites and other Haemosporida" by P. C. C. Garnham published by Blackwell Scientific Publication of Oxford in 1966 is also a valuable review of malariology but in the author's words "is about malaria parasites and not malaria."

This three-volume treatise is appearing in a period of rising activity in malaria research. In the 1950s and 1960s and even into the 1970s funds for this research were scarce and only the hardiest of individuals remained in the field. At present malaria research is again receiving the attention it deserves. The mistaken belief common in the 1950s and 1960s that malaria would soon be eradicated by vector control and chemotherapy and that research was therefore rather pointless has been abandoned in the face of a widespread resurgence of this disease.

A variety of national and international agencies are now funding malaria research. Many individuals attracted by the possibility of funding are turning their efforts to malaria research. Biochemists, immunologists, biophysicists, and molecular biologists among others are entering the field. Many of these individuals, skilled in their specialties, know little or nothing about malaria. It is perhaps to such individuals particularly that this broad review of malariology will be of most value. Even those of us who have worked in some aspects of malaria research for some time may find the reviews of the state of the art in areas other than our own speciality of interest. Those of us actively working in a particular area may find few new facts in the reviews of the areas of our own speciality. I have, however, encouraged the authors to write critical reviews and to relate the facts reported in the literature to each other. Interpretation and speculation are discouraged by the reviewers of most scientific journals in the United States. A

book such as this is thus naturally a convenient vehicle for individuals to present their thoughts as well as the facts.

The authors of the reviews of malaria research included in these volumes met in May 1979 in Mexico City with individuals doing research on the closely related disease babesiosis. Babesiosis has an effect on the development of animal husbandry somewhat similar to the effect of malaria on human societies. At this conference current research on malaria and babesiosis was reported and the similarities and differences between malaria and babesiosis were discussed. As an outgrowth of this conference a volume on babesiosis was developed, which will complement these volumes on malaria.

I extend my thanks to the co-organizers of the conference, Dr. Miodrag Ristic of the College of Veterinary Medicine of the University of Illinois with whom I edited the volume on babesiosis, and Dr. Carlos Arellano-Sota of the Instituto Nacional de Investigaciones Pecuarias in Mexico City. I particularly wish to thank the sponsors of the conference for their encouragement and help. Their support made the conference possible and made the preparation of these volumes on research in malaria and babesiosis a more pleasant task.

I particularly wish to thank John Pino, Director of Agricultural Sciences of the Rockefeller Foundation without whose early support the conference and the babesiosis volume would have been impossible. I also wish to thank Kenneth Warren, Director of Medical Sciences of the Rockefeller Foundation, Edgar A. Smith, Health Services Administrator, James Erickson, Malaria Research Officer of the United States Agency for International Development of the Department of State for their support of the conference.

In addition to the Rockefeller Foundation and the United States Agency for International Development several other organizations contributed to the support of the conference and the development of these volumes. These were The Pan American Health Organization, Parke-Davis Corporations, Merck Sharp & Dohme, Anchor Laboratories, Sandoz Ltd., Pfizer Corporation, and the Wellcome Trust.

Last but by no means least I wish to thank all the authors of the reviews that make up these volumes and Academic Press for their unfailing support.

Julius P. Kreier

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Cesar Lora

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Joseph Hamburger and Julius P. Kreier

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I. INTRODUCTION

The malaria parasite is a complex eukaryotic organism. It is described by the morphologist in terms of plasma membranes, pellicle complexes, microtubules, nuclei, ribosomes, and a multitude of other structures; the biochemist talks about proteins, lipids, and carbohydrates; the physiologist discusses enzymes, and the immunologist and serologist are concerned with antigens. They are all of course talking about the components of the same organism, only their terminology is different, reflecting their specific interests and training. Despite the differences in terminology they all require sufficient quantities of the parasite and its constituents in forms suitable for their specific purposes.

Until recently the only source of parasites was the infected host. Practically speaking this source still remains a dominant one. However, the recent development of continuous *in vitro* culture of *Plasmodium falciparum* is important and will soon lead, no doubt, to large-scale production of the blood forms *in vitro*.

The problem of obtaining sufficient quantities of the parasite is complicated by

*This chapter is a revised version of a review by J. P. Kreier published in 1977 in the *Bulletin of the World Health Organization* **55**, 317-331.