Preface

Over the past 10 years, since the last volume of “Methods in Molecular Medicine” dedicated to malaria was published, many powerful new techniques have been developed that have dramatically changed the landscape of malaria research. The genomes of numerous Plasmodium species have been sequenced, global approaches to parasite biology are being developed, the toolbox for manipulating the parasite genome is of ever-increasing precision, better cellular assays and intra-vital imaging techniques are now available for studying host–parasite interactions, new protection paradigms have been proposed, and new tools to study host immunity have been constructed. The goal of this volume, which is primarily aimed at molecular and cellular malariologists, is to provide a sample of these new tools and techniques. This volume complements and occasionally updates the previous Malaria volume, which offered a comprehensive set of standard techniques for both laboratory and field researchers.

The book is divided into seven parts. The first is an update on parasite culture techniques, which frequently remain the major experimental limitation. The second part overviews the genome manipulation methods, whose reach has steadily increased since the first successes in parasite transfection in 1996. The third highlights some of the “omic” approaches that have now blossomed into powerful functional genomic techniques. The fourth and the fifth parts present the most useful techniques for studying the biology of the red blood cell and pre-erythrocytic stages of Plasmodium, respectively, and their interactions with host cells. Finally, the sixth and seventh parts concentrate on the new tools available to study host immunity to the parasite in experimental models and on some of the novel models of protection against the parasite targeting either the mammalian or insect host.

The book, despite containing 41 chapters, cannot do justice to all of the valuable techniques that have been devised in recent years in the various areas of malaria research. However, all chapters contextualize the protocols they present by outlining complementary techniques and discussing future directions. Some chapters are mainly or purely discursive and offer methodological considerations and guidelines for how to best address specific questions. Therefore the book should provide malaria scientists with a unique resource for navigating the sea of available techniques.

We thank the authors for their creative work and their contributions. We hope that their efforts will facilitate the discovery of more secrets and tricks, and hopefully Achilles’ heels, of the parasite and help the community to translate basic findings into efficient ways to control malaria in the field.

Paris, France

Robert Ménard
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