

1. Record Nr.	UNINA9910830804403321
Titolo	Drug development for malaria : novel approaches for prevention and treatment // edited by Pravin Kendrekar
Pubbl/distr/stampa	Weinheim, Germany : , : Wiley-VCH, , [2023] ©2023
ISBN	3-527-83058-8 3-527-83060-X
Descrizione fisica	1 online resource (395 pages)
Disciplina	616.9362
Soggetti	Malaria - Treatment Drug development
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover -- Title Page -- Copyright -- Contents -- Part I Introduction -- Chapter 1 Chronology of Drug Development for Malaria -- 1.1 Introduction -- 1.1.1 Life Cycle of Malaria (Adapted from CDC) -- 1.2 Malaria - Erstwhile Memories -- 1.2.1 Progress Fighting Malaria -- 1.3 Current Chemotherapy Used to Treat Malaria -- 1.3.1 Current Combination Therapy -- 1.4 Drug Resistance of Antimalarial Drugs -- 1.4.1 Detection of Drug Resistance -- 1.5 Newer Drugs Approved for Malaria Treatment -- 1.6 Current Approaches to Developing a Malaria Vaccine -- 1.6.1 Hope for Vaccine Lies in the Parasite Itself -- 1.7 Conclusion: The Path Forward -- 1.7.1 RTS, S Vaccine: A New Tool with Potential for Africa -- References -- Part II Challenges and Opportunities in Malaria Therapy -- Chapter 2 Scientific Challenges and Treatment Opportunities in the Face of Shifting Malaria Epidemiology -- 2.1 Introduction -- 2.2 The Scientific Challenges Against Malarial Drug -- 2.3 Advances in Understanding and Managing Drug Resistance -- 2.3.1 Vector and Its Control -- 2.3.2 Parasite and Its Control -- 2.3.2.1 Malaria Vaccine -- 2.3.2.2 Antimalarial Drugs -- 2.4 Methods to Assess the Presence and Level of Drug Resistance -- 2.4.1 Therapeutic Efficacy of Antimalarial Drugs -- 2.4.2 Molecular Markers Associated with P. falciparum -- 2.5 Antimalarial Drugs Currently in Use and in the Pipeline -- 2.6 Future -- References -- Chapter 3

Emerging Formulation Technologies Against Malaria Resurgence -- List of Abbreviations -- 3.1 Introduction -- 3.1.1 Major Pathological Hallmarks of Malaria -- 3.1.2 Current Treatment Strategies -- 3.2 Pitfalls of the Current Treatment Regimen -- 3.2.1 Drug Resistance -- 3.2.2 High Drug Dose -- 3.2.3 LongTerm Treatment -- 3.2.4 Recurrence and Reversion of Diseases -- 3.3 NanotechnologyBased Strategies for Targeting in Antimalarial Therapy. 3.3.1 Passive Targeting -- 3.3.2 Active Targeting -- 3.3.2.1 Hepatocyte Targeting -- 3.3.2.2 Erythrocyte Targeting -- 3.3.2.3 Brain Targeting -- 3.3.3 Rapid Diagnosis and Vector Control -- 3.4 Nano Formulations for Malarial Treatment -- 3.4.1 LipidBased Nanoplatfroms -- 3.4.1.1 Nanoemulsion -- 3.4.1.2 SelfEmulsifying Drug Delivery System (SEDDS) -- 3.4.1.3 Solid Lipid Nanoparticles (SLNs) and Nanostructured Lipid Carriers (NLCs) -- 3.4.1.4 Liposome -- 3.4.2 PolymerBased Nanoplatfroms for Malaria -- 3.4.2.1 Nanoparticles -- 3.4.2.2 Nanocapsules -- 3.4.2.3 Dendrimers -- 3.4.2.4 Micelles -- 3.4.2.5 Polymeric Hydrogel Nanoparticles -- 3.4.2.6 Nanosuspension -- 3.4.3 Organized LayerbyLayer Assembly -- 3.4.4 Inorganic Nano architectonics -- 3.4.4.1 Metallic Platforms -- 3.4.4.2 Quantum Dots -- 3.4.4.3 Carbon Nanostructures -- 3.4.4.4 Bioceramics -- 3.4.5 Bio inspired Nanocarriers -- 3.4.5.1 Vaccines Based on Bioinspired Nanocarriers -- 3.4.5.2 Bioengineered Strategy Based on Erythrocytes -- 3.4.6 Protein-PeptideBased Drug Delivery System -- 3.4.7 Stimuli Responsive Platforms for Malaria -- 3.4.7.1 pHResponsive Formulations -- 3.4.7.2 ThermoResponsive Formulations -- 3.4.7.3 Redox State Responsive Substances -- 3.4.7.4 StimuliResponsive Liquid Crystalline Materials -- 3.5 Diagnostics -- 3.5.1 Stimuli Responsive Iron Oxide and Gold Nanoparticle Reagent System -- 3.5.2 Immunological Adjuvants -- 3.5.3 Nanofibers -- 3.6 Challenges in Clinical Translation of Nanomedicine -- 3.6.1 Biological Challenges -- 3.6.2 Biocompatibility and Safety -- 3.6.3 Challenges in Manufacturing ScaleUp and Reproducibility -- 3.6.4 Analytical Characterization and Quality Control Challenges of NanoFormulations -- 3.6.5 Regulatory Challenges -- 3.6.6 Other Challenges -- 3.7 Summary and Future Perspective -- 3.8 Conclusion -- Acknowledgments -- References. Chapter 4 Targeted Drug Delivery for Antimalarial Therapy -- 4.1 Introduction -- 4.2 Remodelling of ParasiteInfected Red Blood Cell (pRBC) -- 4.2.1 The Red Blood Cell Membrane (RBCM) -- 4.2.2 The Parasitophorous Vacuole Membrane (PVM) -- 4.2.3 The Parasite Plasma Membrane (PPM) -- 4.3 The Emergence of Resistance and Antimalarial Therapy Approach -- 4.4 Nanocarriers for Antimalarial Drug Delivery -- 4.4.1 Liposomes -- 4.4.2 Solid Lipid Nanoparticles (SLNs) -- 4.4.3 Nanostructured Lipid Carriers (NLCs) -- 4.4.4 Nanoemulsions (NEs) -- 4.4.5 Polymeric Nanoparticles -- 4.5 Targeted Antimalarial Drug Delivery Systems -- 4.5.1 Passive Drug Targeting with Conventional Nanocarriers -- 4.5.2 Active Drug Targeting with SurfaceModified Nanocarrier -- 4.6 Conclusion: Moving Towards the Future -- Acknowledgements -- References -- Chapter 5 The Imminent Threat of Antimalarial Drug Resistance -- 5.1 Introduction -- 5.2 Antimalarial Drugs: An Overview -- 5.3 The Evolution of CQ Resistance -- 5.3.1 Mechanism of Action of CQ -- 5.3.2 Basis of CQ Resistance -- 5.3.3 Prevalence of CQ Resistance -- 5.3.4 WHO Guidelines to Use CQ -- 5.4 Impact of Sulfadoxine-Pyrimethamine Resistance -- 5.4.1 Mechanism of Action of SP -- 5.4.2 SP Resistance -- 5.4.3 Distribution of DHPS and DHFR Mutation Across Globe -- 5.4.3.1 dhfr -- 5.4.3.2 dhps -- 5.4.4 WHO Guidelines to Use SP -- 5.4.4.1 IPTp Guidelines -- 5.4.4.2 IPTi Guidelines -- 5.5 ACT Resistance -- 5.5.1 Mechanism of Action of ART -- 5.5.2 ART Resistance and ACT Failure -- 5.5.3 WHO Guidelines --

5.6 Conclusion: The Road Ahead -- References -- Chapter 6 Current Therapies and New Drug Targets for the Future Drug Development of Drug Resistant Malaria -- 6.1 Introduction -- 6.2 Life Cycle of Plasmodium falciparum -- 6.3 Current Antimalarial Therapy and Their Shortcomings -- 6.4 Drug Targets for Current Antimalarial Therapy. 6.4.1 Drug Resistant Malaria and Identification of New Targets -- 6.4.1.1 Food Vacuole as Drug Targets -- 6.4.1.2 Shikimic Acid Pathway Targeting -- 6.4.1.3 Targeting Folate Pathway and Methionine Synthesis Pathway -- 6.4.1.4 Glycolytic Pathway Inhibition -- 6.4.2 Mitochondria as Drug Targets -- 6.4.2.1 Targeting Electron Transport Chain -- 6.4.2.2 Inhibition of Dihydroorotate Dehydrogenase -- 6.5 Future Drug Development for the Treatment of Malaria -- 6.5.1 Benefits of Nanocarriers -- 6.5.2 Lipid Based Drug Delivery -- 6.5.3 Liposomes (as Nanocarriers) -- 6.5.4 Nanostructured Lipid Carriers -- 6.5.5 Solid Lipid Nanocarriers -- 6.6 Conclusion -- References -- Part III Drug Development -- Chapter 7 Assays for Antimalarial Drug Discovery -- 7.1 Introduction -- 7.2 In Vitro Assays for Antimalarial Drug Discovery -- 7.2.1 Schizont Maturation Inhibition Assay (Microscopic Test) -- 7.2.2 In Vitro Micro Test Technique -- 7.2.3 Radioisotope Assay -- 7.2.4 Colorimetric Assay (Plasmodium Lactate Dehydrogenase Assay [pLDH]) -- 7.2.5 ELISA Based Methods -- 7.2.5.1 DELI Assay -- 7.2.5.2 Assay Based on Histidine Rich Protein II (HRP II) of P. falciparum -- 7.2.6 Flow Cytometry -- 7.2.7 Fluorometric Assay -- 7.2.8 Hematin Formation (Haemozoin Test) -- 7.2.9 Drug Interaction Assay and Isobologram Analysis -- 7.2.10 PCR Based Methods -- 7.2.11 In Vitro Assays Targeting Exoerythrocytic and Sexual Stages of the Parasite -- 7.2.11.1 Exoerythrocytic Schizontocidal Assay -- 7.2.11.2 Exflagellation Assay -- 7.3 In Vivo Assays for Antimalarial Drug Discovery -- 7.3.1 Peters' 4Day Test -- 7.3.2 Dose Ranging Full 4Day Test -- 7.3.3 Onset/Recrudescence Test -- 7.3.4 Preventive Test -- 7.3.5 Curative Test -- 7.3.6 Hill's Test for Causal Prophylaxis and Residual Activity -- 7.3.7 Assays with P. berghei Green Fluorescent Protein (PbGFP). 7.3.8 Assays Employing Immunocompromised Mice -- 7.3.9 Primate Models for In Vivo Studies -- 7.3.10 Sporontocidal Assays -- 7.3.11 Antisporozoite Assay -- 7.4 Ex Vivo Assays for Antimalarial Drug Discovery -- 7.5 Assays for Assessment of In Vitro Toxicity -- 7.5.1 MTT Assay -- 7.5.2 XTT Assay -- 7.5.3 LDH (Lactate Dehydrogenase) Assay -- 7.5.4 Protein Content Assay -- 7.5.5 Neutral Red Uptake Assay (NRU) -- 7.6 Assays for Assessment of In Vivo Toxicity -- 7.6.1 Acute Toxicity -- 7.6.1.1 Limit Test of Lorke -- 7.6.1.2 Up and Down Procedure -- 7.6.2 Chronic Toxicity -- 7.7 Conclusion -- References -- Chapter 8 Aminoacyl tRNA Synthetases as Malarial Drug Targets: A Structural Biology Perspective -- 8.1 Introduction -- 8.2 Pf/PvaaRSs -- 8.2.1 Pf/Pv Genome -- 8.2.2 Aminoacyl tRNA Synthetases (aaRSs) -- 8.3 Aminoacyl tRNA Synthetases as Druggable Targets -- 8.4 Biochemical Screening of Drug Libraries -- 8.4.1 Colorimetric Assays -- 8.4.2 Enzyme Coupled Assays -- 8.4.3 Luciferase Assay -- 8.4.4 Assay to Test Synthetic as Well as Proofreading Activity -- 8.5 Structurally Validated Pf/PvaaRSs as Drug Targets -- 8.5.1 Lysyl tRNA Synthetase (KRS) -- 8.5.2 Prolyl tRNA Synthetase -- 8.6 Potential Drug Targets Pf/PvaaRSs -- 8.6.1 Leucyl tRNA Synthetase (LRS) -- 8.7 Arginyl tRNA Synthetase (RRS) -- 8.7.1 Tryptophanyl tRNA Synthetase (WRS) -- 8.7.2 Tyrosyl tRNA Synthetase -- 8.8 Others -- 8.9 Conclusion: The Road Ahead -- References -- Chapter 9 Natural Products as a Source for Antimalarial Drug Development Process - An Overview -- 9.1 Introduction -- 9.2 Phytochemicals as Antimalarial Agents: Recent Developments -- 9.2.1 Alkaloids -- 9.2.2 Terpenes --

9.2.2.1 Sesquiterpene Lactones -- 9.2.2.2 Diterpenes -- 9.2.2.3
Triterpenes -- 9.2.2.4 Steroids and Others -- 9.2.3 Polyphenols --
9.2.3.1 Biflavonoids -- 9.2.3.2 Prenylated Flavonoids -- 9.2.3.3 Other
Flavonoids.
9.3 Traditional System of Medicine and Malaria.
