

Malaria

Disease impact There were about 198 million cases of malaria in 2013 and an estimated 584,000 deaths. 90% of all malaria deaths occur in sub-Saharan Africa, and 77% occur in children under five.

Available therapies WHO recommends combination therapy to slow continually evolving resistance, to increase compliance and improve disease control.

Access/Capacity Building AbbVie, Celgene, GSK, MSD, Novartis, Pfizer, Sanofi, and Takeda.

Products approved since 2005 Artesunate-Amodiaquine Winthrop® FDC (Sanofi/DNDi) in Morocco and sub-Saharan countries (2007), WHO prequalified (2008), Pediatric Coartem® Dispersible (Novartis/MMV) (2009), Eurartesim (dihydroartemisinin-piperazine (DHA/PQP)) (MMV/ Sigma-Tau), Pyramax® (fixed-dose combination of pyronaridine and artesunate) (MMV/Shin Poong Pharmaceuticals), Synriam™ (Ranbaxy (Daiichi Sankyo)) in India (2012) and 4 African countries (August 2014), ASMQ FDC (DNDi/Farmanguinhos/ Cipla) WHO prequalified (2012).



Terminated/completed projects since 2005

Artemisone (Bayer HealthCare/MMV), peptide deformylase inhibitor (GSK/MMV), protein fransyltransferase inhibitors (BMS/MMV), intrarectal quinine (Sanofi), 4(1H)-pyridone derivate (GSK/MMV), fatty acid biosynthesis/Fab I (GSK/MMV), chloroproganil-dapsone-artesunate (GSK/MMV), falcipain

inhibitors/cysteine protease (GSK/MMV/UCSF), novel macrolide (GSK/MMV), P. falciparum vaccine (Sanofi/Inst. Pasteur), N-tert butyl Isoquine (GSK/Liv Uni/MMV), Novel Macrolide (GSK/MMV), 4(1H) pyridones Lead – GSK 932121 (GSK/MMV), compound screening (Daiichi Sankyo/MMV), trioxaquine and trioxaquine backup (Sanofi), pyrazoles (Novartis/Drex Uni/Wash Uni), compound library screening (Pfizer/TDR), compound library screening (Pfizer/MMV), pyridone back-up (GSK/MMV), DHODH inhibitors (GSK/MMV), compound screening (Eisai), cysteine protease inhibitors (AbbVie/Penn Uni/MMV), targeted compound screening (MSD), carbazole (Merck/TDR), bis-thiazolium (SAR97276A/T3) (Sanofi), thiazolium back-up (Sanofi/CNRS), Lopinavir/ritonavir (potential preventive therapy) (AbbVie/NIH), MVI AdVac®-based malaria vaccine and NIAID AdVac®-based malaria vaccine (Crucell), backup compound KDU691 (Novartis/Wellcome/MMV/BPRC/Swiss/TPH), compound screening/preclinical support (AbbVie/University of Washington Seattle), MMV AZT-Chloroquine Programs (Pfizer), ELQ300 (Takeda/MMV/GHIT), mini portfolio (AstraZeneca/MMV), focused compound library screening (AstraZeneca/UCSF), focused compound library screening (AstraZeneca/HMS).

Notes Ranbaxy's RBx 11160 initially with MMV. Bayer HealthCare and MMV stopped Artemisone in 2005, the University of Hong Kong has taken it to Phase II with MMV. MSDMK-4815 was initially with MMV.

Company	Partners	Project	Phase
AbbVie	MMV	DSM265 PK studies, formulation evaluation, PD and metabolite sample analysis, pathology peer review; GLP toxicology study conducted; technical consulting	Phase I/IIa
AbbVie	MMV	MMV390048 PK studies, formulation evaluation, PD sample analysis, pathology peer review; technical consulting	Phase I/IIa
AstraZeneca	LSTM	Focused compound library screening at LSTM	Lead identification
AstraZeneca	Harvard School of Public Health	Target identification of leads	Lead identification/optimization
Celgene	MMV	Compound screening	Early lead identification
Daiichi Sankyo	MMV, GHIT	Compound screening	Lead identification
Eisai	Academia	Compound screening	Discovery
Eisai	Fiocruz	Toll-like receptor 9 (TLR9) antagonists	Preclinical
Eisai	St. Jude, MMV, GHIT	Inhibitor of ATP4	Preclinical
Eisai	Broad Inst., GHIT	Inhibitor of Protein Synthesis	Lead optimization
Eisai	MMV, GHIT	Compound screening	Lead identification
Genzyme (Sanofi)	MMV, Broad Inst.	Mini-portfolio	Lead generation
Genzyme (Sanofi)	MMV, Broad Inst.	Aminoindole	Lead optimization
Genzyme (Sanofi)	MMV	DHODH	Lead optimization
GSK	MMV	Tafenoquine (radical cure of P vivax)	Phase III
GSK	MMV	Anti-malarial whole-cell inhibitors	Lead optimization
GSK	Wellcome grant	Anti-malarial whole cell inhibitors	Lead optimization
GSK	MMV	Anti-malarial fast acting	Preclinical
Merck	MMV	Inhibitor of protein synthesis with blood, liver and gametocytic effects	Phase 0
Merck	MMV	Long acting piperinidyl	Lead optimization
Merck	MMV	Long acting backup	Discovery
Merck	MMV, Academia	In-house compound library screening	Discovery
MSD	USF	MK4815	Preclinical
MSD	WEHI	Targeted screening	Discovery
Novartis	Wellcome, MMV, BPRC, Swiss TPH	PI4 Kinase inhibitors	Lead identification
Novartis	Wellcome, MMV, BPRC, Swiss TPH	Imidazolopiperazines (KAF156)	Phase II
Novartis	Wellcome, MMV, BPRC, Swiss TPH	Spiroindolone (KAE609)	Phase II
Novartis	MMV	Coartem® Dispersible	Phase IV
Ranbaxy (Daiichi Sankyo)	company	Arterolane (RBx 11160) and piperazine	Phase III completed
Sanofi	PATH - iOWH	Semi-synthetic artemisinin	Production
Sanofi	DNDi, MMV	Artesunate-amodiaquine Winthrop ASAQ FDC	Phase IV
Sanofi	company	Ferroquine (SSR97193)	Phase II
Sanofi	MMV	Discovery portfolio	Lead optimization
Sanofi	Inst. Pasteur Cambodia	Discovery	Lead generation
Sanofi	Academia	Discovery	Lead generation
Takeda	MMV, GHIT	Compound screening	Lead identification
Takeda	MMV, GHIT	DSM265	Phase I
Vaccines			
Eisai	Fiocruz	Novel vaccines using adjuvant E6020	Preclinical
GSK	PATH, MVI	RTS,S/AS01E vaccine	Under evaluation at EMA
MSD	NYU	CSP synthetic peptide (NANP)6-OMPC conjugate	Discovery
Pfizer	company	Multi – dose vial development	Development