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R&D Pipeline for MALARIA

DISEASE IMPACT¹

Malaria is a life-threatening disease caused by Plasmodium parasites that are transmitted to people through the bites of infected female *Anopheles* mosquitoes. There are five parasite species that cause malaria in humans, and two of these species – *P. falciparum* and *P. vivax* – pose the greatest threat. The former is responsible for most malaria-related deaths globally. Malaria is preventable and curable, and increased efforts are dramatically reducing the malaria burden in many places. In a non-immune individual, symptoms appear seven days or more after the infective mosquito bite. The first symptoms include fever, headache, chills, and vomiting. Multi-organ involvement is frequent in children and adults. In malaria endemic areas, people may develop partial immunity, allowing asymptomatic infections to occur.

KEY FACTS^{2, 3}

- An estimated 6.8 million malaria deaths have been averted globally since 2001.
- In 2015, 91 countries and areas had ongoing malaria transmission, an estimated 214 million cases of malaria and 429,000 deaths occurred worldwide.
- Between 2010 and 2015, the rate of new cases among populations at risk fell by 21% globally. In that same period, malaria mortality rates among populations at risk fell by 29% globally among all age groups, and by 35% among children under five years old.
- In 2015, nearly half of the world’s population was at risk of malaria. Sub-Saharan Africa carries a disproportionately high share of the global malaria burden. In 2015, the region was home to 90% of malaria cases and 92% of malaria deaths.

ABBREVIATIONS	PARTNER’S FULL NAME
BPRC	Biomedical Primate Research Center
Broad Inst.	Broad Institute
CIDR	Center for Infectious Disease Research
DNDi	Drugs for Neglected Diseases initiative
Fiocruz	Fundação Oswaldo Cruz
GHIT	Global Health Innovative Technology Fund
iBET	Instituto de Biologia Experimental e Tecnológica
INSERM	Institut National de la Santé et de la Recherche Médicale
Inst. Pasteur Cambodia	Institut Pasteur Cambodia
INTS	Institut National de La Transfusion Sanguine
Liv Uni	Liverpool University
LSHTM	London School of Hygiene and Tropical Medicine
LSTM	Liverpool School of Tropical Medicine
Melbourne Uni	University of Melbourne

ABBREVIATIONS	PARTNER’S FULL NAME
MMV	Medicines for Malaria Venture
Pretoria Uni	University of Pretoria
SGC	Structural Genomics Consortium
St. Jude	St. Jude Medical
Swiss TPH	Swiss Tropical and Public Health Institute
Syngene	Syngene International
TCOLF	Tres Cantos Open Lab Foundation
UCSD	University of California, San Diego
UCT	University of Cape Town
Wash Uni	University of Washington
WEHI	Walter & Eliza Hall Institute
Wellcome	Wellcome Trust

¹ <http://www.who.int/mediacentre/factsheets/fs094/en/>
² <http://www.who.int/mediacentre/factsheets/fs094/en/>

³ <https://www.cdc.gov/malaria/>

CURRENT R&D PROJECTS

COMPANY	PARTNERS	PROJECT	PHASE	TYPE
AbbVie	MMV	DSM265: PK studies, formulation evaluation, PD and metabolite sample analysis, pathology peer review, technical consulting	Phase II	Medicine
	MMV	MMV390048 PK studies, formulation evaluation, PD sample analysis, pathology peer review, technical consulting	Phase I	Medicine
	MMV	DSM421: Next generation: PK testing, compound and formulation characterization, metabolite ID, toxicology study, study design &/or study conduct	Preclinical	Medicine
AstraZeneca	Wash Uni	Compound screening and preclinical support	Screening	Medicine
	MMV	Hyterocycle	Hit to lead	Medicine
	H3D UCT		Hit identification	Medicine
Celgene	MMV, Swiss TPH, Syngene	Development of treatments	Early lead identification	Medicine
Daiichi Sankyo	MMV, GHIT	Identification of pre-clinical candidate as an anti-malarial agent	Lead optimization	Medicine
	MMV, GHIT	Screening program (Natural Products Library)	Hit identification	Medicine
Eisai	LSTM, Liv Uni, GHIT	Development of treatments for artemisinin-resistant patients	Discovery	Medicine
	Fiocruz	TLR9 antagonist for cerebral Malaria (E6446)	Preclinical	Vaccine
	St. Jude, MMV, GHIT	SJ733 - Inhibitor of Plasmodium ATP4	Phase I	Medicine
	Broad Inst., GHIT	Novel inhibitor of Plasmodium Phe tRNA ligase	Lead optimization	Medicine
	MMV, GHIT	Compound screening	Lead identification	Medicine
	MMV, GHIT	Inhibitor of Plasmodium GWT-1	Discovery	Medicine
	Fiocruz	Novel vaccines using immunostimulant E6020	Preclinical	Vaccine
GlaxoSmithKline	MMV	Tafenoquine (radical cure of P. vivax)	Phase III	Medicine
	MMV	Anti-malarial whole-cell inhibitors	Lead optimization	Medicine
	Wellcome	Anti-malarial whole cell inhibitors	Lead optimization	Medicine
	MMV	Anti-malarial fast acting	Preclinical	Medicine
	TCOLF, LSHTM	Screening GSK compound libraries to identify new inhibitor scaffolds targeting parasite PKG enzyme	Discovery	Vaccine
	TCOLF, INTS, INSERM	BlockBackMalaria	Discovery	Medicine
	TCOLF, CIDR	Identification of small-molecule inhibitors of Plasmodium NMT	Discovery	Medicine
	TCOLF, Melbourne Uni	High throughput screening to identify selective proteasome inhibitors as new antimalarials with a novel mode of action	Screening	Medicine
	TCOLF, BPRC	Optimization of hepatocyte culture to support drug screening for malaria hypnozoites	Screening	Medicine
	SGC	Identification of small molecule inhibitors targeting Plasmodium methyltransferase set1 and elongation factor 2	Discovery	Medicine
Janssen (J&J)	MMV	Development of long acting injectables for prevention and treatment	Preclinical	Medicine
	MMV	New anti-malarial drug	Preclinical	Medicine
	MMV, UCT, UCSD, Syngene	Early stage antimalarial projects: Target to lead Optimization	Basic research	Medicine
	UCT, MMV	Early stage antimalarial project: Hit optimization	Basic research	Medicine
Merck	iBET	Enabling Technology: Developing a new malaria liver stage platform	Basic research	Enabling Technology for new medicines
	Company	MUSE – diagnostic kit for malaria	Basic research	Diagnostics
	Pretoria Uni	IR 3535 – vector control for malaria	Basic research	Vector control
MSD	WEHI, Wellcome	Early stage hit optimization	Hit to lead	Medicine
	Company	Malaria project 1: discovering new NCEs for patients with artemisinin-resistant strains of malaria or liver stage malaria	Drug discovery	Medicine
	UCT	Malaria project 2: discovering new NCEs for patients with artemisinin-resistant strains of malaria or liver stage malaria	Drug discovery	Medicine
Novartis	Company	Coartem 80/480: developing a new formulation with 75% reduced pill burden for patients with body weight 35kg+	Phase IV	Medicine
	Wellcome, MMV, BPRC, Swiss TPH	Imidazolopiperazines (KAF156): developing an NCE for patients with artemisinin-resistant strains of malaria	Phase II	Medicine
	Wellcome, MMV, BPRC, Swiss TPH	Spiroindolone (KAE609): developing an NCE for patients with artemisinin-resistant strains of malaria	Phase II	Medicine
	MMV	Coartem® Dispersible: developing a new formulation for younger children	Phase IV	Medicine
Sanofi	MMV	Oz 439/ Ferroquine	Phase IIb	Medicine
	Academia	Low-dose primaquine for elimination settings	Basic research	Medicine
	Company	Ferroquine (SSR97193)	Phase II	Medicine
	MMV	Discovery portfolio	Lead generation	Medicine
	Inst. Pasteur Cambodia	SUB1 protein: new mechanism discovery	Lead generation	Medicine
	Academia	Screening molecules library	Lead generation	Medicine
Genzyme (Sanofi)	MMV, Broad Inst.	Mini-portfolio	Lead generation	Medicine
	MMV, Broad Inst.	Aminoindole	Lead optimization	Medicine
	MMV	DHODH	Lead optimization	Medicine
Takeda	MMV, GHIT	Hit-to-lead	Lead identification	Medicine
	MMV, GHIT	DSM265	Phase II	Medicine
	MMV, GHIT	DSM421	Preclinical (plans to go into Phase I in 2017)	Medicine
	MMV, GHIT, Melbourne Uni	Proteasome Inhibitors as new potent resistance-reversing antimalarials	Target identification	Medicine

Total R&D projects for Malaria: 53