

## GEPHE SUMMARY

	Gephebase Gene		GepheID
kelch 13 (K13) ( <a +kelch+13+(k13)^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+kelch+13+(K13)^#gephebase-summary-title</a> )		GP00001388	
	Entry Status	Courtier	Main curator
Published			

## PHENOTYPIC CHANGE

	Trait Category		
Physiology ( <a +physiology^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Physiology^#gephebase-summary-title</a> )			
	Trait		
Xenobiotic resistance (artemisinin) ( <a +xenobiotic+resistance+(artemisinin)^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Xenobiotic+resistance+(artemisinin)^#gephebase-summary-title</a> )			
	Trait State in Taxon A		
Plasmodium falciparum			
	Trait State in Taxon B		
Plasmodium falciparum			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Intraspecific ( <a +intraspecific^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Intraspecific^#gephebase-summary-title</a> )			
	Taxon A	Taxon B	
	Latin Name		Latin Name
Plasmodium falciparum ( <a +plasmodium+falciparum^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Plasmodium+falciparum^#gephebase-summary-title</a> )		Plasmodium falciparum ( <a +plasmodium+falciparum^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Plasmodium+falciparum^#gephebase-summary-title</a> )	
	Common Name		Common Name
malaria parasite P. falciparum		malaria parasite P. falciparum	
	Synonyms		Synonyms
Plasmodium (Laverania) falciparum; malaria parasite P. falciparum		Plasmodium (Laverania) falciparum; malaria parasite P. falciparum	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Alveolata; Apicomplexa; Aconoidasida; Haemosporida; Plasmodiidae; Plasmodium; Plasmodium (Laverania)		cellular organisms; Eukaryota; Alveolata; Apicomplexa; Aconoidasida; Haemosporida; Plasmodiidae; Plasmodium; Plasmodium (Laverania)	
	Parent		Parent
Plasmodium (Laverania) () - (Rank: subgenus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=418107">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=418107</a> )		Plasmodium (Laverania) () - (Rank: subgenus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=418107">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=418107</a> )	
	NCBI Taxonomy ID		NCBI Taxonomy ID
5833 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=5833">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=5833</a> )		5833 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=5833">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=5833</a> )	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

## GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Plasmodium falciparum
PF13_0238		A0A077LQB4 ( <a href="http://www.uniprot.org/uniprot/A0A077LQB4">http://www.uniprot.org/uniprot/A0A077LQB4</a> )	
	Synonyms		GenebankID or UniProtKB
K13		()	
	String		
-			
	Sequence Similarities		
-			
	GO - Molecular Function		
-			
	GO - Biological Process		
GO:0051260 : protein homooligomerization ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0051260">https://www.ebi.ac.uk/QuickGO/term/GO:0051260</a> )			
	GO - Cellular Component		
-			
			Presumptive Null
No ( <a +no^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Presumptive+Null=">https://www.gephebase.org/search-criteria?/and+Presumptive+Null="+No^#gephebase-summary-title</a> )			
			Molecular Type
Coding ( <a +coding^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Molecular+Type=">https://www.gephebase.org/search-criteria?/and+Molecular+Type="+Coding^#gephebase-summary-title</a> )			
			Aberration Type

SNP ([https://www.gephebase.org/search-criteria?/and+Aberration Type="+SNP^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=))

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

M476I

Experimental Evidence

Candidate Gene ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence="+Candidate Gene^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=))

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Main Reference

Drug resistance. K13-propeller mutations confer artemisinin resistance in Plasmodium falciparum clinical isolates. (2015) (<https://pubmed.ncbi.nlm.nih.gov/25502314>)

Authors

Straimer J; Gnãdig NF; Witkowski B; Amaratunga C; Duru V; Ramadani AP; Dacheux M; Khim N; Zhang L; Lam S; Gregory PD; Urnov FD; Mercereau-Pujalon O; Benoit-Vical F; Fairhurst RM; Månard D; Fidock DA

Abstract

The emergence of artemisinin resistance in Southeast Asia imperils efforts to reduce the global malaria burden. We genetically modified the Plasmodium falciparum K13 locus using zinc-finger nucleases and measured ring-stage survival rates after drug exposure in vitro; these rates correlate with parasite clearance half-lives in artemisinin-treated patients. With isolates from Cambodia, where resistance first emerged, survival rates decreased from 13 to 49% to 0.3 to 2.4% after the removal of K13 mutations. Conversely, survival rates in wild-type parasites increased from 30.6% to 2 to 29% after the insertion of K13 mutations. These mutations conferred elevated resistance to recent Cambodian isolates compared with that of reference lines, suggesting a contemporary contribution of additional genetic factors. Our data provide a conclusive rationale for worldwide K13-propeller sequencing to identify and eliminate artemisinin-resistant parasites.

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Additional References

## RELATED GEPHE

Related Genes

6 (apicoplast ribosomal protein S10, chloroquine resistance transporter, ferredoxin, kelch 13, multidrug resistance protein 2, protein phosphatase) ([https://www.gephebase.org/search-criteria?/or+Taxon ID="+5833^/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=))

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS

@GxG confirmed by in vitro test but effect also depends of genetic background