

## GEPHE SUMMARY

	Gephebase Gene	GephelD
Sulfotransferase-OXA-Resistance (SULT-OR) ( <a href="https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Sulfotransferase-OXA-Resistance (SULT-OR)^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Sulfotransferase-OXA-Resistance (SULT-OR)^#gephebase-summary-title</a> )	GP00001470	Main curator
	Prigent	
Published	Entry Status	

## PHENOTYPIC CHANGE

	Trait Category	
Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title</a> )	Trait	
Xenobiotic resistance (oxamniquine) ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic resistance (oxamniquine)^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic resistance (oxamniquine)^#gephebase-summary-title</a> )	Trait State in Taxon A	
Human blood fluke OXA-sensitive (wild-type)	Trait State in Taxon B	
Human blood fluke laboratory-selected OXA-resistant (500-fold reduction in drug sensitivity)	Ancestral State	
Taxon A	Taxonomic Status	
Intraspecific ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title</a> )		
	Taxon A	Taxon B
	Latin Name	Latin Name
Schistosoma mansoni ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Schistosoma mansoni^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Schistosoma mansoni^#gephebase-summary-title</a> )	Schistosoma mansoni ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Schistosoma mansoni^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Schistosoma mansoni^#gephebase-summary-title</a> )	
	Common Name	Common Name
-	Synonyms	Synonyms
-	Rank	Rank
species	Lineage	Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Platyhelminthes; Trematoda; Digenea; Strigeidida; Schistosomatoidea; Schistosomatidae; Schistosoma		
	Parent	Parent
Schistosoma () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6181">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6181</a> )	Schistosoma () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6181">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6181</a> )	
6183 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6183">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6183</a> )	NCBI Taxonomy ID 6183 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6183">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6183</a> )	NCBI Taxonomy ID 6183 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6183">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6183</a> )
No	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?
	No	

## GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Schistosoma mansoni
SULT-OR	Synonyms	GenebankID or UniProtKB
Smp_089320	String	
	Sequence Similarities	
	GO - Molecular Function	
GO:0016740 : transferase activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0016740">https://www.ebi.ac.uk/QuickGO/term/GO:0016740</a> )		
	GO - Biological Process	
	GO - Cellular Component	
		Presumptive Null
No ( <a href="https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title</a> )		Molecular Type

Coding ([https://www.gephebase.org/search-criteria?/and+Molecular Type=%27Coding%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular%20Type=%27Coding%27#gephebase-summary-title))

Aberration Type

Deletion ([https://www.gephebase.org/search-criteria?/and+Aberration Type=%27Deletion%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration%20Type=%27Deletion%27#gephebase-summary-title))

Deletion Size

1-9 bp

Molecular Details of the Mutation

E142del

Experimental Evidence

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=%27Linkage Mapping%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental%20Evidence=%27Linkage%20Mapping%27#gephebase-summary-title))

Main Reference

Genetic and molecular basis of drug resistance and species-specific drug action in schistosome parasites. (2013) (<https://pubmed.ncbi.nlm.nih.gov/24263136>)

Authors

Valentim CL; Cioli D; Chevalier FD; Cao X; Taylor AB; Holloway SP; Pica-Mattoccia L; Guidi A; Bassi A; Tsai IJ; Berriman M; Carvalho-Queiroz C; Almeida M; Aguilar H; Frantz DE; Hart PJ; LoVerde PT; Anderson TJ

Abstract

Oxamniquine resistance evolved in the human blood fluke (*Schistosoma mansoni*) in Brazil in the 1970s. We crossed parental parasites differing ~500-fold in drug response, determined drug sensitivity and marker segregation in clonally derived second-generation progeny, and identified a single quantitative trait locus (logarithm of odds = 31) on chromosome 6. A sulfotransferase was identified as the causative gene by using RNA interference knockdown and biochemical complementation assays, and we subsequently demonstrated independent origins of loss-of-function mutations in field-derived and laboratory-selected resistant parasites. These results demonstrate the utility of linkage mapping in a human helminth parasite, while crystallographic analyses of protein-drug interactions illuminate the mode of drug action and provide a framework for rational design of oxamniquine derivatives that kill both *S. mansoni* and *S. haematobium*, the two species responsible for >99% of schistosomiasis cases worldwide.

Additional References

## RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

2 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=%27Sulfotransferase-OXA-Resistance \(SULT-OR\)%27/and+Taxon ID=%276183%27/or+Gene Gephebase=%27Sulfotransferase-OXA-Resistance \(SULT-OR\)%27/and+Taxon ID=%276183%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene%20Gephebase=%27Sulfotransferase-OXA-Resistance%20(SULT-OR)%27/and+Taxon%20ID=%276183%27/or+Gene%20Gephebase=%27Sulfotransferase-OXA-Resistance%20(SULT-OR)%27/and+Taxon%20ID=%276183%27#gephebase-summary-title))

## EXTERNAL LINKS

## COMMENTS

identified as the causative gene using RNAi knockdown and biochemical complementation assays