

## 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> )	GP00001471	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 field-derived OXA-resistant (from a Brazilian patient in 1978)	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
Schistosoma mansoni ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=%Schistosoma+mansi%#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=%Schistosoma+mansi%#gephebase-summary-title</a> )	Latin Name	Latin Name
-	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		
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> )	Parent	Parent
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	NCBI Taxonomy ID
No	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?
	No	

## GENOTYPIC CHANGE

SULT-OR	Generic Gene Name	UniProtKB Schistosoma mansoni
Smp_089320	Synonyms	GenebankID or UniProtKB
-	String	KU952091 ( <a href="https://www.ncbi.nlm.nih.gov/nucleotide/KU952091">https://www.ncbi.nlm.nih.gov/nucleotide/KU952091</a> )
-	Sequence Similarities	
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 - Molecular Function	
-	GO - Biological Process	
-	GO - Cellular Component	
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> )		Presumptive Null
Coding ( <a href="https://www.gephebase.org/search-criteria?/and+Molecular+Type=%Coding%#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Molecular+Type=%Coding%#gephebase-summary-title</a> )		Molecular Type

SNP (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=%SNP%#gephebase-summary-title>)

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

C35R (T&gt;C)

Experimental Evidence

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

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

## 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; Basso 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=%Sulfotransferase-OXA-Resistance+\(SULT-OR\)%/and+Taxon+ID=%6183%/or+Gene+Gephebase=%Sulfotransferase-OXA-Resistance+\(SULT-OR\)%/and+Taxon+ID=%6183%#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=%Sulfotransferase-OXA-Resistance+(SULT-OR)%/and+Taxon+ID=%6183%/or+Gene+Gephebase=%Sulfotransferase-OXA-Resistance+(SULT-OR)%/and+Taxon+ID=%6183%#gephebase-summary-title))

## EXTERNAL LINKS

## COMMENTS

protein was unable to activate OXA