

GEPHE SUMMARY

	Gephebase Gene	GephelD
fibrinogen-related protein 1 (FREP1) (#gephebase-summary-title)	GP00001465	Main curator
	Prigent	
Published	Entry Status	

PHENOTYPIC CHANGE

	Trait Category	
Physiology (#gephebase-summary-title)	Trait	
Pathogen resistance (Plasmodium; malaria parasite) (#gephebase-summary-title)	Trait	
Anopheles gambiae susceptible to Plasmodium falciparum infection	Trait State in Taxon A	
Anopheles gambiae resistant to Plasmodium falciparum infection	Trait State in Taxon B	
Taxon A	Ancestral State	
	Taxonomic Status	
Intraspecific (#gephebase-summary-title)	Taxonomic Status	
Taxon A	Latin Name	Taxon B
Anopheles gambiae (#gephebase-summary-title)	Anopheles gambiae (#gephebase-summary-title)	Anopheles gambiae (#gephebase-summary-title)
African malaria mosquito	Common Name	Common Name
Anopheles gambiae S; African malaria mosquito; Anopheles gambiae Giles, 1902;	Synonyms	Anopheles gambiae S; African malaria mosquito; Anopheles gambiae Giles, 1902;
Anopheles gambia	Rank	Rank
species	Lineage	Lineage
cellular organisms; Eukaryota; Opistokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Nematocera; Culicomorpha; Culicoidea; Culicidae; Anophelinae; Anopheles; Cellia; Pyretophorus; gambiae species complex	Parent	cellular organisms; Eukaryota; Opistokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Nematocera; Culicomorpha; Culicoidea; Culicidae; Anophelinae; Anopheles; Cellia; Pyretophorus; gambiae species complex
gambiae species complex () - (Rank: no rank) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 44542)	NCBI Taxonomy ID	Parent
7165 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7165)	is Taxon A an Infraspecies?	NCBI Taxonomy ID
No		is Taxon B an Infraspecies?

GENOTYPIC CHANGE

3290292	Generic Gene Name	UniProtKB Anopheles gambiae
AgaP_AGAP007031	Synonyms	GenebankID or UniProtKB
7165.AGAP007031-PA (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=7165.AGAP007031-PA)	String	XM_565171 (https://www.ncbi.nlm.nih.gov/nuccore/XM_565171)
-	Sequence Similarities	
-	GO - Molecular Function	
-	GO - Biological Process	

No (https://www.gephebase.org/search-criteria?/and+Presumptive+Null=%No%#gephebase-summary-title)	Presumptive Null
Coding (https://www.gephebase.org/search-criteria?/and+Molecular+Type=%Coding%#gephebase-summary-title)	Molecular Type
SNP (https://www.gephebase.org/search-criteria?/and+Aberration+Type=%SNP%#gephebase-summary-title)	Aberration Type
Nonsynonymous	SNP Coding Change
c.T1325A p.Q442L	Molecular Details of the Mutation
Association Mapping (https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=%Association+Mapping%#gephebase-summary-title)	Experimental Evidence

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

Genome-block expression-assisted association studies discover malaria resistance genes in <i>Anopheles gambiae</i> . (2013) (https://pubmed.ncbi.nlm.nih.gov/24297936)	Main Reference
Li J; Wang X; Zhang G; Githure JI; Yan G; James AA	Authors

The malaria parasite-resistance island (PRI) of the African mosquito vector, *Anopheles gambiae*, was mapped to five genomic regions containing 80 genes, using coexpression patterns of genomic blocks. High-throughput sequencing identified 347 nonsynonymous single-nucleotide polymorphisms within these genes in mosquitoes from malaria-endemic areas in Kenya. Direct association studies between nonsynonymous single-nucleotide polymorphisms and *Plasmodium falciparum* infection identified three naturally occurring genetic variations in each of three genes (*An. gambiae* adenosine deaminase, fibrinogen-related protein 30, and fibrinogen-related protein 1) that were associated significantly with parasite infection. A role for these genes in the resistance phenotype was confirmed by RNA interference knockdown assays. Silencing fibrinogen-related protein 30 increased parasite infection significantly, whereas ablation of fibrinogen-related protein 1 transcripts resulted in mosquitoes nearly free of parasites. The discovered genes and single-nucleotide polymorphisms are anticipated to be useful in the development of tools for malaria control in endemic areas in Africa.

Additional References

RELATED GEPHE

4 (adenosine deaminase (AgADA), APL1 cluster, fibrinogen-related protein 30 (FBN30), thioester-containing protein 1) (https://www.gephebase.org/search-criteria?/or+TaxonID=%7165%and+Trait=Pathogen+resistance/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS

the role of the gene is confirmed by RNA interference knockdown assays. Silencing of the gene resulted in a reduction in infection by *P. berghei*