GEPHE SUMMARY

Gephebase Gene
thioester-containing protein 1 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^thioester-containing protein 1^#gephebase-summary-title)

GepheID
GP00001125

Entry Status
Published

Main curator
Courtier

PHENOTYPIC CHANGE

Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)

Trait
Pathogen resistance (Plasmodium; malaria parasite) (https://www.gephebase.org/search-criteria?/and+Trait=^Pathogen resistance (Plasmodium; malaria parasite)^#gephebase-summary-title)

Trait State in Taxon A
synonym: Anopheles gambiae S form

Trait State in Taxon B
Anopheles gambiae M form

Ancestral State
Data not curated

Taxonomic Status
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)

Taxon A

Latin Name
Anopheles gambiae (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Anopheles gambiae^#gephebase-summary-title)

Common Name
African malaria mosquito

Synonyms
Anopheles gambiae S; African malaria mosquito; Anopheles gambiae Giles, 1902; Anopheles gambia

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; 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
gambiae species complex () - (Rank: no rank) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 44542)

NCBI Taxonomy ID
7165 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7165)

is Taxon A an Infraspecies?
Yes

Taxon A Description
synonym: Anopheles gambiae S form

Taxon B

Latin Name
Anopheles coluzzii (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Anopheles coluzzii^#gephebase-summary-title)

Common Name
-

Synonyms
Anopheles gambiae M; Anopheles coluzzii Coetzee & Wilkerson, 2013

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; 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
gambiae species complex () - (Rank: no rank) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 44542)

NCBI Taxonomy ID
1518534 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 1518534)

is Taxon B an Infraspecies?
Yes

Taxon B Description
Anopheles gambiae M form

GENOTYPIC CHANGE

Generic Gene Name
TEP-I

Synonyms
-

String
-

Sequence Similarities
-

GO - Molecular Function
GO:0004866 : endopeptidase inhibitor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004866)

GO - Biological Process
-

UniProtKB Anopheles gambiae
Q9GYW4 (http://www.uniprot.org/uniprot/Q9GYW4)

GenebankID or UniProtKB
CBA02654 (https://www.ncbi.nlm.nih.gov/nuccore/CBA02654)

GO - Cellular Component

GO:0005615 : extracellular space (https://www.ebi.ac.uk/QuickGO/term/GO:0005615)

Presumptive Null

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title)

Molecular Type

Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Coding^#gephebase-summary-title)

Aberration Type

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

Molecular Details of the Mutation

coding change - exact causing mutation(s) unknown

Experimental Evidence

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

Main Reference

Dissecting the genetic basis of resistance to malaria parasites in Anopheles gambiae. (2009) (https://pubmed.ncbi.nlm.nih.gov/19797663)

Authors

Blandin SA; Wang-Sattler R; Lamacchia M; Gagneur J; Lycett G; Ning Y; Levashina EA; Steinmetz LM

Abstract

The ability of Anopheles gambiae mosquitoes to transmit Plasmodium parasites is highly variable between individuals. However, the genetic basis of this variability has remained unknown. We combined genome-wide mapping and reciprocal allele-specific RNA interference (rasRNAi) to identify the genomic locus that confers resistance to malaria parasites and demonstrated that polymorphisms in a single gene encoding the antiparasitic thioester-containing protein 1 (TEP1) explain a substantial part of the variability in parasite killing. The link between TEP1 alleles and resistance to malaria may offer new tools for controlling malaria transmission. The successful application of rasRNAi in Anopheles suggests that it could also be applied to other organisms where RNAi is feasible to dissect complex phenotypes to the level of individual quantitative trait alleles.

Additional References

Adaptive divergence between incipient species of Anopheles gambiae increases resistance to Plasmodium. (2011) (https://pubmed.ncbi.nlm.nih.gov/21173248)

RELATED GEPHE

Related Genes

4 (adenosine deaminase (AgADA), APL1 cluster, fibrinogen-related protein 1 (FREP1), fibrinogen-related protein 30 (FBN30)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^7165^/and+Trait=Pathogen resistance/or+Taxon ID=^1518534^/and+Trait=Pathogen resistance/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

Other genes besides TEP1 must contribute to the resistance phenotype