

GEPHE SUMMARY

	Gephebase Gene	GephelD
glb-5 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase='^glb-5'^#gephebase-summary-title)	GP00000399	
	Entry Status	Main curator
Published	Martin	

PHENOTYPIC CHANGE

Trait #1	Trait Category	
Behavior (https://www.gephebase.org/search-criteria?/and+Trait Category='Behavior'^#gephebase-summary-title)	Trait	
CO2 avoidance (https://www.gephebase.org/search-criteria?/and+Trait='^CO2 avoidance'^#gephebase-summary-title)	Trait State in Taxon A	
C. elegans - N2	Trait State in Taxon B	
C.elegans - CB4856		

Trait #2	Trait Category	
Behavior (https://www.gephebase.org/search-criteria?/and+Trait Category='Behavior'^#gephebase-summary-title)	Trait	
Aggregation behavior (https://www.gephebase.org/search-criteria?/and+Trait='^Aggregation behavior'^#gephebase-summary-title)	Trait State in Taxon A	
-	Trait State in Taxon B	
-		

Taxon A	Ancestral State	
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status='^Intraspecific'^#gephebase-summary-title)	Taxonomic Status	
Taxon A	Latin Name	Latin Name
Caenorhabditis elegans (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms='^Caenorhabditis elegans'^#gephebase-summary-title)	Common Name	Common Name
-	Synonyms	Synonyms
roundworm; Rhabditis elegans; Caenorhabditis elegans (Maupas, 1900); Rhabditis elegans Maupas, 1900	Rank	Rank
species	Lineage	Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Rhabditomorpha; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis	Parent	Parent
Caenorhabditis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6237)	NCBI Taxonomy ID	NCBI Taxonomy ID
6239 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6239)	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?
Yes	Taxon A Description	Taxon B Description
C. elegans - N2	C.elegans -CB4856	

GENOTYPIC CHANGE

glb-5	Generic Gene Name	UniProtKB Caenorhabditis elegans
C18C4.1; CELE_C18C4.1	Synonyms	GenebankID or UniProtKB
6239.C18C4.1b (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=6239.C18C4.1b)	String	
Belongs to the globin family.	Sequence Similarities	
	GO - Molecular Function	
GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)		
GO:0020037 : heme binding (https://www.ebi.ac.uk/QuickGO/term/GO:0020037)		
GO:0005344 : oxygen carrier activity (https://www.ebi.ac.uk/QuickGO/term/GO:0005344)		
GO:0019826 : oxygen sensor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0019826)		
	GO - Biological Process	
GO:0003032 : detection of oxygen (https://www.ebi.ac.uk/QuickGO/term/GO:0003032)		
	GO - Cellular Component	
-		
Yes (#gephebase-summary-title)		Presumptive Null
Coding (#gephebase-summary-title)		Molecular Type
Indel (#gephebase-summary-title)		Aberration Type
100-999 bp		Indel Size
765bp insertion/duplication resulting in a truncation of the last 179 amino acids of the protein and the inclusion of 40 different residues		Molecular Details of the Mutation
Linkage Mapping (#gephebase-summary-title)		Experimental Evidence
Quantitative mapping of a digenic behavioral trait implicates globin variation in <i>C. elegans</i> sensory behaviors. (2009) (https://pubmed.ncbi.nlm.nih.gov/19285466)		Main Reference
McGrath PT; Rockman MV; Zimmer M; Jang H; Macosko EZ; Kruglyak L; Bargmann CI		Authors
Most heritable behavioral traits have a complex genetic basis, but few multigenic traits are understood at a molecular level. Here we show that the <i>C. elegans</i> strains N2 and CB4856 have opposite behavioral responses to simultaneous changes in environmental O ₂ and CO ₂ . We identify two quantitative trait loci (QTL) that affect this trait and map each QTL to a single-gene polymorphism. One gene, npr-1, encodes a previously described neuropeptide receptor whose high activity in N2 promotes CO ₂ avoidance. The second gene, glb-5, encodes a neuronal globin domain protein whose high activity in CB4856 modifies behavioral responses to O ₂ and combined O ₂ /CO ₂ stimuli. glb-5 acts in O ₂ -sensing neurons to increase O ₂ -evoked calcium signals, implicating globins in sensory signaling. An analysis of wild <i>C. elegans</i> strains indicates that the N2 alleles of npr-1 and glb-5 arose recently in the same strain background, possibly as an adaptation to laboratory conditions.	Abstract	
Long-range regulatory polymorphisms affecting a GABA receptor constitute a quantitative trait locus (QTL) for social behavior in <i>Caenorhabditis elegans</i> . (2012) (https://pubmed.ncbi.nlm.nih.gov/23284308)		Additional References
Natural variation in a neural globin tunes oxygen sensing in wild <i>Caenorhabditis elegans</i> . (2009) (https://pubmed.ncbi.nlm.nih.gov/19262507)		

RELATED GEPHE

3 (arc-1, exp-1, npr-1) (#gephebase-summary-title)	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS

