

GEPHE SUMMARY

g1b-5 (<a +g1b-5+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+g1b-5+"#gephebase-summary-title)	Gephebase Gene	GP00000399	GepheID
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

Trait #1	Trait Category
Behavior (<a +behavior+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Behavior+"#gephebase-summary-title)	Trait
CO2 avoidance (<a +co2+avoidance+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">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 (<a +behavior+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Behavior+"#gephebase-summary-title)	Trait
Aggregation behavior (<a +aggregation+behavior+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">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 (<a +intraspecific+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Intraspecific+"#gephebase-summary-title)	Taxonomic Status

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

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

GENOTYPIC CHANGE

glb-5	Generic Gene Name	A3RMS5 (http://www.uniprot.org/uniprot/A3RMS5)	UniProtKB <i>Caenorhabditis elegans</i>
C18C4.1; CELE_C18C4.1	Synonyms	BX284605 (https://www.ncbi.nlm.nih.gov/nucore/BX284605)	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 (https://www.gephebase.org/search-criteria?/and+Presumptive+Null=~Yes^#gephebase-summary-title)			Presumptive Null
Coding (https://www.gephebase.org/search-criteria?/and+Molecular+Type=~Coding^#gephebase-summary-title)			Molecular Type
Indel (https://www.gephebase.org/search-criteria?/and+Aberration+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 (https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=~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, <i>npr-1</i> , encodes a previously described neuropeptide receptor whose high activity in N2 promotes CO ₂ avoidance. The second gene, <i>glb-5</i> , encodes a neuronal globin domain protein whose high activity in CB4856 modifies behavioral responses to O ₂ and combined O ₂ /CO ₂ stimuli. <i>glb-5</i> 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 <i>npr-1</i> and <i>glb-5</i> 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 (<i>arcp-1</i> , <i>exp-1</i> , <i>npr-1</i>) (https://www.gephebase.org/search-criteria?/or+Taxon+ID=~6239^/and+Trait=CO2+avoidance/or+Taxon+ID=~6239^/and+Trait=Aggregation+behavior/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS

