

GEPHE SUMMARY

arcp-1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase+^arcp-1*#gephebase-summary-title)	Gephebase Gene	GP00002067	GepheID
Published	Entry Status	Courtier	Main curator

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
inhibited after exposure to high oxygen levels	Trait State in Taxon B
not inhibited after exposure to high oxygen levels	

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
does not suppress aggregation behavior of npr-1(null) animals	Trait State in Taxon B
suppress aggregation behavior of npr-1(null) animals	

Taxon A	Ancestral State
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status+^Intraspecific*#gephebase-summary-title)	Taxonomic Status

Taxon A	Latin Name
Caenorhabditis elegans (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?
No	

Taxon B	Latin Name
Caenorhabditis elegans (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
French JU1249 strain	

GENOTYPIC CHANGE

CELE_F34D10.6	Generic Gene Name	C6KRH4 (http://www.uniprot.org/uniprot/C6KRH4)	UniProtKB <i>Caenorhabditis elegans</i>
CELE_F34D10.6; F34D10.6	Synonyms	0	GenebankID or UniProtKB
6239.F34D10.6a (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=6239.F34D10.6a)	String		
-	Sequence Similarities		
-	GO - Molecular Function		
-	GO - Biological Process		
-	GO - Cellular Component		
Yes (#https://www.gephebase.org/search-criteria?/and+Presumptive+Null=~Yes)	Presumptive Null		
Coding (#https://www.gephebase.org/search-criteria?/and+Molecular+Type=~Coding)	Molecular Type		
Deletion (#https://www.gephebase.org/search-criteria?/and+Aberration+Type=~Deletion)	Aberration Type		
1-9 bp	Deletion Size		
8 bp deletion (mfP22) in the open reading frame	Molecular Details of the Mutation		
Linkage Mapping (#https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=~Linkage+Mapping)	Experimental Evidence		
Natural Variation in a Dendritic Scaffold Protein Remodels Experience-Dependent Plasticity by Altering Neuropeptide Expression. (2019) (https://pubmed.ncbi.nlm.nih.gov/31757604)	Main Reference		
Beets I; Zhang G; Fenk LA; Chen C; Nelson GM; FÄ©lix MA; de Bono M	Authors		
The extent to which behavior is shaped by experience varies between individuals. Genetic differences contribute to this variation, but the neural mechanisms are not understood. Here, we dissect natural variation in the behavioral flexibility of two <i>Caenorhabditis elegans</i> wild strains. In one strain, a memory of exposure to 21% O ₂ suppresses CO ₂ -evoked locomotory arousal; in the other, CO ₂ evokes arousal regardless of previous O ₂ experience. We map that variation to a polymorphic dendritic scaffold protein, ARCP-1, expressed in sensory neurons. ARCP-1 binds the Ca ²⁺ -dependent phosphodiesterase PDE-1 and co-localizes PDE-1 with molecular sensors for CO ₂ at dendritic ends. Reducing ARCP-1 or PDE-1 activity promotes CO ₂ escape by altering neuropeptide expression in the BAG CO ₂ sensors. Variation in ARCP-1 alters behavioral plasticity in multiple paradigms. Our findings are reminiscent of genetic accommodation, an evolutionary process by which phenotypic flexibility in response to environmental variation is reset by genetic change.	Abstract		
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RELATED GEPHE

3 (glb-5, exp-1, npr-1) (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#)	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS