## GEPHE SUMMARY

Gephebase Gene
egl-4 (Ppa-egl-4) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^egl-4 (Ppa-egl-4)^#gephebase-summary-title)

GepheID
GP00000260

Entry Status
Published

Main curator
Martin

## PHENOTYPIC CHANGE

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

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

Trait State in Taxon A
Pristionchus pacificus

Trait State in Taxon B
Pristionchus pacificus

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
Pristionchus pacificus (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Pristionchus pacificus^#gephebase-summary-title)

Common Name
-

Synonyms
-

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Diplogasteromorpha; Diplogasteroidea; Neodiplogasteridae; Pristionchus

Parent
Pristionchus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 54125 )

NCBI Taxonomy ID
54126 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 54126 )

is Taxon A an Infraspecies?
No

### Taxon B

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

Common Name
-

Synonyms
-

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Diplogasteromorpha; Diplogasteroidea; Neodiplogasteridae; Pristionchus

Parent
Pristionchus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 54125 )

NCBI Taxonomy ID
54126 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 54126 )

is Taxon B an Infraspecies?
No

## GENOTYPIC CHANGE

Generic Gene Name
egl-4

Synonyms
cgk-1; odr-9; F55A8.2

String
6239.F55A8.2a.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 6239.F55A8.2a.1 )

Sequence Similarities
Belongs to the protein kinase superfamily. AGC Ser/Thr protein kinase family. cGMP subfamily.

GO - Molecular Function
GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)
GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)
GO:0030553 : cGMP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0030553)
GO:0004692 : cGMP-dependent protein kinase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004692)

GO - Biological Process
GO:0006468 : protein phosphorylation (https://www.ebi.ac.uk/QuickGO/term/GO:0006468)

UniProtKB Caenorhabditis elegans
O76360 (http://www.uniprot.org/uniprot/O76360)

GenebankID or UniProtKB
()

GO:0006935 : chemotaxis (https://www.ebi.ac.uk/QuickGO/term/GO:0006935)
GO:0030308 : negative regulation of cell growth
(https://www.ebi.ac.uk/QuickGO/term/GO:0030308)
GO:0010468 : regulation of gene expression
(https://www.ebi.ac.uk/QuickGO/term/GO:0010468)
GO:1903998 : regulation of eating behavior
(https://www.ebi.ac.uk/QuickGO/term/GO:1903998)
GO:0030431 : sleep (https://www.ebi.ac.uk/QuickGO/term/GO:0030431)
GO:0046662 : regulation of oviposition
(https://www.ebi.ac.uk/QuickGO/term/GO:0046662)
GO:0008340 : determination of adult lifespan
(https://www.ebi.ac.uk/QuickGO/term/GO:0008340)
GO:0008355 : olfactory learning (https://www.ebi.ac.uk/QuickGO/term/GO:0008355)
GO:0007635 : chemosensory behavior
(https://www.ebi.ac.uk/QuickGO/term/GO:0007635)
GO:0043577 : chemotropism (https://www.ebi.ac.uk/QuickGO/term/GO:0043577)
GO:0008286 : insulin receptor signaling pathway
(https://www.ebi.ac.uk/QuickGO/term/GO:0008286)
GO:0030536 : larval feeding behavior
(https://www.ebi.ac.uk/QuickGO/term/GO:0030536)
GO:0050849 : negative regulation of calcium-mediated signaling
(https://www.ebi.ac.uk/QuickGO/term/GO:0050849)
GO:0010754 : negative regulation of cGMP-mediated signaling
(https://www.ebi.ac.uk/QuickGO/term/GO:0010754)
GO:1902160 : negative regulation of cyclic nucleotide-gated ion channel activity
(https://www.ebi.ac.uk/QuickGO/term/GO:1902160)
GO:0061067 : negative regulation of dauer larval development
(https://www.ebi.ac.uk/QuickGO/term/GO:0061067)
GO:0040015 : negative regulation of multicellular organism growth
(https://www.ebi.ac.uk/QuickGO/term/GO:0040015)
GO:0046621 : negative regulation of organ growth
(https://www.ebi.ac.uk/QuickGO/term/GO:0046621)
GO:0030512 : negative regulation of transforming growth factor beta receptor signaling
pathway (https://www.ebi.ac.uk/QuickGO/term/GO:0030512)
GO:0018105 : peptidyl-serine phosphorylation
(https://www.ebi.ac.uk/QuickGO/term/GO:0018105)
GO:1905959 : positive regulation of cellular response to alcohol
(https://www.ebi.ac.uk/QuickGO/term/GO:1905959)
GO:0010753 : positive regulation of cGMP-mediated signaling
(https://www.ebi.ac.uk/QuickGO/term/GO:0010753)
GO:0050921 : positive regulation of chemotaxis
(https://www.ebi.ac.uk/QuickGO/term/GO:0050921)
GO:0051343 : positive regulation of cyclic-nucleotide phosphodiesterase activity
(https://www.ebi.ac.uk/QuickGO/term/GO:0051343)
GO:1901046 : positive regulation of oviposition
(https://www.ebi.ac.uk/QuickGO/term/GO:1901046)
GO:1990335 : process resulting in tolerance to alcohol
(https://www.ebi.ac.uk/QuickGO/term/GO:1990335)
GO:0040014 : regulation of multicellular organism growth
(https://www.ebi.ac.uk/QuickGO/term/GO:0040014)
GO:0042542 : response to hydrogen peroxide
(https://www.ebi.ac.uk/QuickGO/term/GO:0042542)
GO:1990834 : response to odorant (https://www.ebi.ac.uk/QuickGO/term/GO:1990834)
GO:0070482 : response to oxygen levels
(https://www.ebi.ac.uk/QuickGO/term/GO:0070482)
GO:0050913 : sensory perception of bitter taste
(https://www.ebi.ac.uk/QuickGO/term/GO:0050913)

GO - Cellular Component

GO:0005737 : cytoplasm (https://www.ebi.ac.uk/QuickGO/term/GO:0005737)
GO:0005829 : cytosol (https://www.ebi.ac.uk/QuickGO/term/GO:0005829)
GO:0005634 : nucleus (https://www.ebi.ac.uk/QuickGO/term/GO:0005634)

Presumptive Null

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

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

unknown

Experimental Evidence

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

Main Reference

Natural variation in Pristionchus pacificus insect pheromone attraction involves the protein kinase EGL-4. (2008) (https://pubmed.ncbi.nlm.nih.gov/18509055)

Authors

Hong RL; Witte H; Sommer RJ

Abstract

The geographical mosaic theory of coevolution predicts that different local species interactions will shape population traits, but little is known about the molecular factors involved in mediating the specificity of these interactions. Pristionchus nematodes associate with different scarab beetles around the world, with Pristionchus pacificus isolated primarily from the oriental beetle in

Japan. In particular, the constituent populations of P. pacificus represent a rare opportunity to study multiple specialized interactions and the mechanisms that influence population traits at the genetic level. We identified a component of the cGMP signaling pathway to be involved in the natural variation for sensing the insect pheromone ETDA, using targeted introgression lines, exogenous cGMP treatment, and a null egl-4 allele. Our data strongly implicate egl-4 as one of several loci involved in behavioral variation in P. pacificus populations. That EGL-4 homologs have been independently implicated for behavioral variations in other invertebrate models suggests that EGL-4 may act as a modulator for interspecies behavioral repertoires across large phylogenetic distances.

Additional References

## RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS

Evidence of genotype-phenotype relationship commented in Pubpeer: https://pubpeer.com/publications/800D97630D57184AEA3531409128E1