GEPHE SUMMARY

Gephebase Gene

avpr1a (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^avpr1a^#gephebase-summary-title)

GepheID

GP00000129

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

Male sexual fidelity (monogamous regime) (https://www.gephebase.org/search-criteria?/and+Trait=^Male sexual fidelity (monogamous regime)^#gephebase-summary-title)

Trait State in Taxon A

Microtus ochrogaster

Trait State in Taxon B

Microtus ochrogaster

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

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

Common Name

prairie vole

Synonyms

prairie vole; prairie voles

Rank

species

Lineage

cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Cricetidae; Arvicolinae; Microtus

Parent

Microtus (meadow voles) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 10053)

NCBI Taxonomy ID

79684 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 79684)

is Taxon A an Infraspecies?

No

Taxon B

Latin Name

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

Common Name

prairie vole

Synonyms

prairie vole; prairie voles

Rank

species

Lineage

cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Cricetidae; Arvicolinae; Microtus

Parent

Microtus (meadow voles) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 10053)

NCBI Taxonomy ID

79684 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 79684)

is Taxon B an Infraspecies?

No

GENOTYPIC CHANGE

Generic Gene Name

Avpr1a

Synonyms

V1a; AVPR; V1aR; Avpr1

String

10090.ENSMUSP00000020323 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=10090.ENSMUSP00000020323)

Sequence Similarities

Belongs to the G-protein coupled receptor 1 family. Vasopressin/oxytocin receptor subfamily.

GO - Molecular Function

GO:0017046 : peptide hormone binding (https://www.ebi.ac.uk/QuickGO/term/GO:0017046)
GO:0031894 : V1A vasopressin receptor binding (https://www.ebi.ac.uk/QuickGO/term/GO:0031894)
GO:0005000 : vasopressin receptor activity

UniProtKB Mus musculus

Q62463 (http://www.uniprot.org/uniprot/Q62463)

GenebankID or UniProtKB

()

(https://www.ebi.ac.uk/QuickGO/term/GO:0005000)

GO - Biological Process

GO:0010033 : response to organic substance
(https://www.ebi.ac.uk/QuickGO/term/GO:0010033)
GO:0007186 : G protein-coupled receptor signaling pathway
(https://www.ebi.ac.uk/QuickGO/term/GO:0007186)
GO:0008284 : positive regulation of cell proliferation
(https://www.ebi.ac.uk/QuickGO/term/GO:0008284)
GO:0019722 : calcium-mediated signaling
(https://www.ebi.ac.uk/QuickGO/term/GO:0019722)
GO:0032870 : cellular response to hormone stimulus
(https://www.ebi.ac.uk/QuickGO/term/GO:0032870)
GO:0042631 : cellular response to water deprivation
(https://www.ebi.ac.uk/QuickGO/term/GO:0042631)
GO:0007625 : grooming behavior (https://www.ebi.ac.uk/QuickGO/term/GO:0007625)
GO:0002125 : maternal aggressive behavior
(https://www.ebi.ac.uk/QuickGO/term/GO:0002125)
GO:0042711 : maternal behavior (https://www.ebi.ac.uk/QuickGO/term/GO:0042711)
GO:0014902 : myotube differentiation
(https://www.ebi.ac.uk/QuickGO/term/GO:0014902)
GO:0007621 : negative regulation of female receptivity
(https://www.ebi.ac.uk/QuickGO/term/GO:0007621)
GO:0051970 : negative regulation of transmission of nerve impulse
(https://www.ebi.ac.uk/QuickGO/term/GO:0051970)
GO:0043084 : penile erection (https://www.ebi.ac.uk/QuickGO/term/GO:0043084)
GO:0045777 : positive regulation of blood pressure
(https://www.ebi.ac.uk/QuickGO/term/GO:0045777)
GO:0030307 : positive regulation of cell growth
(https://www.ebi.ac.uk/QuickGO/term/GO:0030307)
GO:0032849 : positive regulation of cellular pH reduction
(https://www.ebi.ac.uk/QuickGO/term/GO:0032849)
GO:0007204 : positive regulation of cytosolic calcium ion concentration
(https://www.ebi.ac.uk/QuickGO/term/GO:0007204)
GO:0014049 : positive regulation of glutamate secretion
(https://www.ebi.ac.uk/QuickGO/term/GO:0014049)
GO:0010460 : positive regulation of heart rate
(https://www.ebi.ac.uk/QuickGO/term/GO:0010460)
GO:0031394 : positive regulation of prostaglandin biosynthetic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0031394)
GO:0035815 : positive regulation of renal sodium excretion
(https://www.ebi.ac.uk/QuickGO/term/GO:0035815)
GO:0003084 : positive regulation of systemic arterial blood pressure
(https://www.ebi.ac.uk/QuickGO/term/GO:0003084)
GO:0045907 : positive regulation of vasoconstriction
(https://www.ebi.ac.uk/QuickGO/term/GO:0045907)
GO:0001992 : regulation of systemic arterial blood pressure by vasopressin
(https://www.ebi.ac.uk/QuickGO/term/GO:0001992)
GO:0051412 : response to corticosterone
(https://www.ebi.ac.uk/QuickGO/term/GO:0051412)
GO:0010035 : response to inorganic substance
(https://www.ebi.ac.uk/QuickGO/term/GO:0010035)
GO:0035176 : social behavior (https://www.ebi.ac.uk/QuickGO/term/GO:0035176)
GO:0042713 : sperm ejaculation (https://www.ebi.ac.uk/QuickGO/term/GO:0042713)
GO:0021537 : telencephalon development
(https://www.ebi.ac.uk/QuickGO/term/GO:0021537)

GO - Cellular Component

GO:0005886 : plasma membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0005886)
GO:0005887 : integral component of plasma membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0005887)
GO:0031410 : cytoplasmic vesicle (https://www.ebi.ac.uk/QuickGO/term/GO:0031410)

Presumptive Null

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

Molecular Type

Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Cis-regulatory^#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

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

Main Reference

Sexual fidelity trade-offs promote regulatory variation in the prairie vole brain. (2015) (https://pubmed.ncbi.nlm.nih.gov/26659055)

Authors

Okhovat M; Berrio A; Wallace G; Ophir AG; Phelps SM

Abstract

Individual variation in social behavior seems ubiquitous, but we know little about how it relates to brain diversity. Among monogamous prairie voles, levels of vasopressin receptor (encoded by the gene avpr1a) in brain regions related to spatial memory predict male space use and sexual fidelity in the field. We find that trade-offs between the benefits of male fidelity and infidelity are reflected in patterns of territorial intrusion, offspring paternity, avpr1a expression, and the evolutionary fitness of alternative avpr1a alleles. DNA variation at the avpr1a locus includes

polymorphisms that reliably predict the epigenetic status and neural expression of avpr1a, and patterns of DNA diversity demonstrate that avpr1a regulatory variation has been favored by selection. In prairie voles, trade-offs in the fitness consequences of social behaviors seem to promote neuronal and molecular diversity.

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Additional References

Complex selection on a regulator of social cognition: Evidence of balancing selection, regulatory interactions and population differentiation in the prairie vole Avpr1a locus. (2018) (https://pubmed.ncbi.nlm.nih.gov/29218792)

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@SexualTrait