

GEPHE SUMMARY

Gephebase Gene
MC1R

Entry Status
Published

GepheID
GP00000594

Main curator
Martin

PHENOTYPIC CHANGE

Trait Category
Morphology

Trait
Coloration (coat)

Trait State in Taxon A
Peromyscus polionotus

Trait State in Taxon B
Peromyscus polionotus

Ancestral State
Data not curated

Taxonomic Status
Intraspecific

Taxon A

Latin Name

Peromyscus polionotus

Common Name
oldfield mouse

Synonyms
oldfield mouse

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; Neotominae; Peromyscus

Parent
Peromyscus () - (Rank: genus)

NCBI Taxonomy ID
42413

is Taxon A an Intraspecies?
No

Taxon B

Latin Name

Peromyscus polionotus

Common Name
oldfield mouse

Synonyms
oldfield mouse

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; Neotominae; Peromyscus

Parent
Peromyscus () - (Rank: genus)

NCBI Taxonomy ID
42413

is Taxon B an Intraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
MC1R

Synonyms
CMMS; MSH-R; SHEP2; MSHR

String
9606.ENSP00000451605

Sequence Similarities
Belongs to the G-protein coupled receptor 1 family.

GO - Molecular Function
GO:0008528 : G protein-coupled peptide receptor activity
GO:0004977 : melanocortin receptor activity
GO:0004980 : melanocyte-stimulating hormone receptor activity
GO:0031625 : ubiquitin protein ligase binding

GO - Biological Process
GO:0007275 : multicellular organism development
GO:0045944 : positive regulation of transcription by RNA polymerase II
GO:0042438 : melanin biosynthetic process
GO:0043473 : pigmentation

UniProtKB Homo sapiens
Q01726

GenebankID or UniProtKB
ACK76654

GO:0007186 : G protein-coupled receptor signaling pathway
GO:0051897 : positive regulation of protein kinase B signaling
GO:0019233 : sensory perception of pain
GO:0007189 : adenylate cyclase-activating G protein-coupled receptor signaling pathway
GO:0035556 : intracellular signal transduction
GO:0007187 : G protein-coupled receptor signaling pathway, coupled to cyclic nucleotide second messenger
GO:0032720 : negative regulation of tumor necrosis factor production
GO:0010739 : positive regulation of protein kinase A signaling
GO:0090037 : positive regulation of protein kinase C signaling
GO:0009650 : UV protection
GO:0070914 : UV-damage excision repair

GO - Cellular Component

GO:0005886 : plasma membrane
GO:0005887 : integral component of plasma membrane

Presumptive Null

No

Molecular Type

Coding

Aberration Type

SNP

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

R65C

Experimental Evidence

Linkage Mapping

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Main Reference

[A single amino acid mutation contributes to adaptive beach mouse color pattern. \(2006\)](#)

Authors

Hoekstra HE; Hirschmann RJ; Bunday RA; Insel PA; Crossland JP

Abstract

Natural populations of beach mice exhibit a characteristic color pattern, relative to their mainland conspecifics, driven by natural selection for crypsis. We identified a derived, charge-changing amino acid mutation in the melanocortin-1 receptor (Mct1r) in beach mice, which decreases receptor function. In genetic crosses, allelic variation at Mct1r explains 9.8% to 36.4% of the variation in seven pigmentation traits determining color pattern. The derived Mct1r allele is present in Florida's Gulf Coast beach mice but not in Atlantic coast mice with similar light coloration, suggesting that different molecular mechanisms are responsible for convergent phenotypic evolution. Here, we link a single mutation in the coding region of a pigmentation gene to adaptive quantitative variation in the wild.

Additional References

RELATED GEPHE

Related Genes

1 (Agouti)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

