

GEPHE SUMMARY

Gephebase Gene
MC1R

Entry Status
Published

GepheID
GP00000577

Main curator
Martin

PHENOTYPIC CHANGE

Trait Category
Morphology

Trait
Coloration (coat)

Trait State in Taxon A
Chaetodipus intermedius

Trait State in Taxon B
Chaetodipus intermedius

Ancestral State
Taxon A

Taxonomic Status
Intraspecific

Taxon A

Latin Name
Chaetodipus intermedius

Common Name
rock pocket mouse

Synonyms
rock pocket 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; Castorimorpha; Heteromyidae; Perognathinae; Chaetodipus

Parent
Chaetodipus (coarse-haired pocket mice) - (Rank: genus)

NCBI Taxonomy ID
38666

is Taxon A an Intraspecies?
No

Taxon B

Latin Name
Chaetodipus intermedius

Common Name
rock pocket mouse

Synonyms
rock pocket 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; Castorimorpha; Heteromyidae; Perognathinae; Chaetodipus

Parent
Chaetodipus (coarse-haired pocket mice) - (Rank: genus)

NCBI Taxonomy ID
38666

is Taxon B an Intraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
MC1R

Synonyms
CMM5; 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
GO:0007186 : G protein-coupled receptor signaling pathway

UniProtKB Homo sapiens
Q01726

GenebankID or UniProtKB
AAP03515

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

R109W

Experimental Evidence

Candidate Gene

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

Main Reference

The genetic basis of adaptive melanism in pocket mice. (2003)

Authors

Nachman MW; Hoekstra HE; D'Agostino SL

Abstract

Identifying the genes underlying adaptation is a major challenge in evolutionary biology. Here, we describe the molecular changes underlying adaptive coat color variation in a natural population of rock pocket mice, *Chaetodipus intermedius*. Rock pocket mice are generally light-colored and live on light-colored rocks. However, populations of dark (melanic) mice are found on dark lava, and this concealing coloration provides protection from avian and mammalian predators. We conducted association studies by using markers in candidate pigmentation genes and discovered four mutations in the melanocortin-1-receptor gene, *Mclr*, that seem to be responsible for adaptive melanism in one population of lava-dwelling pocket mice. Interestingly, another melanic population of these mice on a different lava flow shows no association with *Mclr* mutations, indicating that adaptive dark color has evolved independently in this species through changes at different genes.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

3

EXTERNAL LINKS

COMMENTS

