GEPHE SUMMARY

Gephebase Gene
Agouti

GephelD
GP00000057

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

Trait Category
Morphology

Trait
Coloration (coat; dorso-ventral)

Trait State in Taxon A
Peromyscus polionotus subgriseus (mainland)

Trait State in Taxon B
Peromyscus polionotus leucocephalus (beach)

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 Infraspecies?
Yes

Taxon A Description
Peromyscus polionotus subgriseus (mainland)

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 Infraspecies?
Yes

Taxon B Description
Peromyscus polionotus leucocephalus (beach)

GENOTYPIC CHANGE

Generic Gene Name
Asip

Synonyms
As; ASP; A<y>; ASIP; a

String
10090.ENSMUSP00000029123

Sequence Similarities
-

GO - Molecular Function
GO:0031779 : melanocortin receptor binding
GO:0031781 : type 3 melanocortin receptor binding
GO:0031782 : type 4 melanocortin receptor binding

GO - Biological Process
GO:0008343 : adult feeding behavior
GO:0006091 : generation of precursor metabolites and energy
GO:0071514 : genetic imprinting

UniProtKB Mus musculus
Q03288

GenebankID or UniProtKB
ABV02195

GO:0009755 : hormone-mediated signaling pathway
GO:0042438 : melanin biosynthetic process
GO:0032438 : melanosome organization
GO:0032402 : melanosome transport
GO:0043473 : pigmentation
GO:0048023 : positive regulation of melanin biosynthetic process
GO:0040030 : regulation of molecular function, epigenetic

GO - Cellular Component
GO:0005576 : extracellular region
GO:0005623 : cell

Presumptive Null
No

Molecular Type
Cis-regulatory

Aberration Type
Unknown

Molecular Details of the Mutation
Not identified

Experimental Evidence
Linkage Mapping

Main Reference
The developmental role of Agouti in color pattern evolution. (2011)

Authors
Manceau M; Domingues VS; Mallarino R; Hoekstra HE

Abstract
Animal color patterns can affect fitness in the wild; however, little is known about the mechanisms that control their formation and subsequent evolution. We took advantage of two locally camouflaged populations of Peromyscus mice to show that the negative regulator of adult pigmentation, Agouti, also plays a key developmental role in color pattern evolution. Genetic and functional analyses showed that ventral-specific embryonic expression of Agouti establishes a prepattern by delaying the terminal differentiation of ventral melanocytes. Moreover, a skin-specific increase in both the level and spatial domain of Agouti expression prevents melanocyte maturation in a regionalized manner, resulting in a novel and adaptive color pattern. Thus, natural selection favors late-acting, tissue-specific changes in embryonic Agouti expression to produce large changes in adult color pattern.

Additional References

RELATED GEPHE

Related Genes
1 (MC1R)
Related Haplotypes
2

COMMENTS