

GEPHE SUMMARY

Gephebase Gene
opsin - (SWS1)

Entry Status
Published

GepheID
GP00000764

Main curator
Martin

PHENOTYPIC CHANGE

Trait Category
Physiology

Trait
Color vision (UV-shift)

Trait State in Taxon A
Other passeriforms

Trait State in Taxon B
Taeniopygia guttata

Ancestral State
Data not curated

Taxonomic Status
Intergeneric or Higher

	Taxon A	Taxon B
Latin Name	<i>Passeriformes</i>	<i>Taeniopygia guttata</i>
Common Name	-	zebra finch
Synonyms	-	Poephila guttata; Taeniopygia guttata; zebra finch; Taeniopygia guttata (Vieillot, 1817)
Rank	order	species
Lineage	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Sauropsida; Sauria; Archelosauria; Archosauria; Dinosauria; Saurischia; Theropoda; Coelurosauria; Aves; Neognathae	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Sauropsida; Sauria; Archelosauria; Archosauria; Dinosauria; Saurischia; Theropoda; Coelurosauria; Aves; Neognathae; Passeriformes; Passeroidea; Estrildidae; Estrildinae; Taeniopygia
Parent	Neognathae () - (Rank: superorder)	Taeniopygia () - (Rank: genus)
NCBI Taxonomy ID	9126	59729
is Taxon A an Intraspecies?	No	No

GENOTYPIC CHANGE

Generic Gene Name
OPN1SW

Synonyms
BCP; BOP; CBT

String
9606.ENSP00000249389

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

GO - Molecular Function
GO:0038023 : signaling receptor activity
GO:0008020 : G protein-coupled photoreceptor activity

GO - Biological Process
GO:0007165 : signal transduction
GO:0007186 : G protein-coupled receptor signaling pathway
GO:0001523 : retinoid metabolic process
GO:0018298 : protein-chromophore linkage
GO:0007601 : visual perception
GO:0071482 : cellular response to light stimulus

UniProtKB Homo sapiens
P03999

GenebankID or UniProtKB
AAP23977

GO:0007602 : phototransduction

GO - Cellular Component

GO:0005887 : integral component of plasma membrane

GO:0001750 : photoreceptor outer segment

GO:0097381 : photoreceptor disc membrane

Presumptive Null

No

Molecular Type

Coding

Aberration Type

SNP

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

S90C

Experimental Evidence

Candidate Gene

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Ser	Cys	90

Main Reference

Ultraviolet pigments in birds evolved from violet pigments by a single amino acid change. (2000)

Authors

Yokoyama S; Radlwimmer FB; Blow NS

Abstract

UV vision has profound effects on the evolution of organisms by affecting such behaviors as mating preference and foraging strategies. Despite its importance, the molecular basis of UV vision is not known. Here, we have transformed the zebra finch UV pigment into a violet pigment by incorporating one amino acid change, C84S. By incorporating the reverse mutations, we have also constructed UV pigments from the orthologous violet pigments of the pigeon and chicken. These results and comparative amino acid sequence analyses of the pigments in vertebrates demonstrate that many avian species have achieved their UV vision by S84C.

Additional References

The molecular evolution of avian ultraviolet- and violet-sensitive visual pigments. (2007)

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

COMMENTS