GEPHE SUMMARY

Gephebase Gene
opsin - (SWS1) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^opsin - (SWS1)^#gephebase-summary-title)

Entry Status
Published

GepheID
GP00000764

Main curator
Martin

PHENOTYPIC CHANGE

Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)

Trait
Color vision (UV-shift) (https://www.gephebase.org/search-criteria?/and+Trait=^Color vision (UV-shift)^#gephebase-summary-title)

Trait State in Taxon A
Other passeriforms

Trait State in Taxon B
Taeniopygia guttata

Ancestral State
Data not curated

Taxonomic Status
Intergeneric or Higher (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intergeneric or Higher^#gephebase-summary-title)

Taxon A

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

Common Name
-

Synonyms
-

Rank
order

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

Parent
Neognathae () - (Rank: superorder) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 8825)

NCBI Taxonomy ID
9126 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9126)

is Taxon A an Infraspecies?
No

Taxon B

Latin Name
Taeniopygia guttata (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Taeniopygia guttata^#gephebase-summary-title)

Common Name
zebra finch

Synonyms
Poephila guttata; Taenopygia guttata; zebra finch; Taeniopygia guttata (Vieillot, 1817)

Rank
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; Passeriformes; Passeroidea; Estrildidae; Estrildinae; Taeniopygia

Parent
Taeniopygia () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 59728)

NCBI Taxonomy ID
59729 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 59729)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
OPN1SW

Synonyms
BCP; BOP; CBT

String
9606.ENSP00000249389 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=9606.ENSP00000249389)

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

GO - Molecular Function
GO:0038023 : signaling receptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0038023)
GO:0008020 : G protein-coupled photoreceptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0008020)

GO - Biological Process
GO:0007165 : signal transduction (https://www.ebi.ac.uk/QuickGO/term/GO:0007165)

UniProtKB Homo sapiens
P03999 (http://www.uniprot.org/uniprot/P03999)

GenebankID or UniProtKB
AAP23977 (https://www.ncbi.nlm.nih.gov/nuccore/AAP23977)

GO:0007186 : G protein-coupled receptor signaling pathway
(https://www.ebi.ac.uk/QuickGO/term/GO:0007186)
GO:0001523 : retinoid metabolic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0001523)
GO:0018298 : protein-chromophore linkage
(https://www.ebi.ac.uk/QuickGO/term/GO:0018298)
GO:0007601 : visual perception (https://www.ebi.ac.uk/QuickGO/term/GO:0007601)
GO:0071482 : cellular response to light stimulus
(https://www.ebi.ac.uk/QuickGO/term/GO:0071482)
GO:0007602 : phototransduction (https://www.ebi.ac.uk/QuickGO/term/GO:0007602)

GO - Cellular Component

GO:0005887 : integral component of plasma membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0005887)
GO:0001750 : photoreceptor outer segment
(https://www.ebi.ac.uk/QuickGO/term/GO:0001750)
GO:0097381 : photoreceptor disc membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0097381)

Presumptive Null

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title)

Molecular Type

Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Coding^#gephebase-summary-title)

Aberration Type

SNP (https://www.gephebase.org/search-criteria?/and+Aberration Type=^SNP^#gephebase-summary-title)

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

S90C

Experimental Evidence

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

	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) (https://pubmed.ncbi.nlm.nih.gov/10861005)

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) (https://pubmed.ncbi.nlm.nih.gov/17556758)

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS