

GEPHE SUMMARY

opsin - (SWS1) (<a +opsin+"-+(sws1)^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+opsin+"-+(SWS1)^#gephebase-summary-title)		Gephebase Gene	GP00000760	GepheID
Published	Entry Status	Courtier		Main curator

PHENOTYPIC CHANGE

Physiology (<a +physiology^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Physiology^#gephebase-summary-title)		Trait Category		
Color vision (UV-shift) (<a +color+vision+(uv-shift)^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Color+vision+(UV-shift)^#gephebase-summary-title)		Trait		
Other birds	Trait State in Taxon A			
Melopsittacus undulatus	Trait State in Taxon B			
Taxon A	Ancestral State			
Intergeneric or Higher (<a +intergeneric+or+higher^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Intergeneric+or+Higher^#gephebase-summary-title)		Taxonomic Status		
	Taxon A		Taxon B	
Aves	Latin Name	Melopsittacus undulatus	Latin Name	
(<a +aves^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Aves^#gephebase-summary-title)	Common Name	(<a +melopsittacus+undulatus^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Melopsittacus+undulatus^#gephebase-summary-title)	Common Name	
birds	Synonyms	budgerigar	Synonyms	
avian; birds	Rank	budgerigar	Rank	
class	Lineage	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	Parent	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; Psittaciformes; Psittaculidae; Melopsittacus	Parent	
Coelurosauria () - (Rank: no rank)	NCBI Taxonomy ID	Melopsittacus () - (Rank: genus)	NCBI Taxonomy ID	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=436492)	8782	(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=13145)	13146	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=8782)	is Taxon A an Intraspecies?	(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=13146)	is Taxon B an Intraspecies?	
No		No		

GENOTYPIC CHANGE

OPN1SW	Generic Gene Name	P03999 (http://www.uniprot.org/uniprot/P03999)	UniProtKB Homo sapiens
BCP; BOP; CBT	Synonyms	ACV60158 (https://www.ncbi.nlm.nih.gov/nuccore/ACV60158)	GenebankID or UniProtKB
9606.ENSPO0000249389	String		
(http://string-db.org/newstring.cgi/show_network_section.pl?identifier=9606.ENSPO0000249389)	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)			

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)

Mutation #1

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

Presumptive Null

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

Molecular Type

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

Aberration Type

Nonsynonymous

SNP Coding Change

S86A and S90C - both have phenotypic effect - effect of S86 tested in Anolis carolinensis

Molecular Details of the Mutation

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

Experimental Evidence

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Ser	Ala	86

Ultraviolet pigments in birds evolved from violet pigments by a single amino acid change. (2000) (https://pubmed.ncbi.nlm.nih.gov/10861005)

Main Reference

Yokoyama S; Radlwimmer FB; Blow NS

Authors

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.

Abstract

The molecular evolution of avian ultraviolet- and violet-sensitive visual pigments. (2007) (https://pubmed.ncbi.nlm.nih.gov/17556758)

Additional References

Mutation #2

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

Presumptive Null

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

Molecular Type

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

Aberration Type

Nonsynonymous

SNP Coding Change

S86A and S90C - both have phenotypic effect - S90C corresponds to S84C in PMID 10861005

Molecular Details of the Mutation

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

Experimental Evidence

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

Ultraviolet pigments in birds evolved from violet pigments by a single amino acid change. (2000) (https://pubmed.ncbi.nlm.nih.gov/10861005)

Main Reference

Authors

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

No matches found.

Related Genes

Related Haplotypes

5 ([https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=^opsin+\(SWS1\)^/and+Taxon+ID=^8782^/or+Gene+Gephebase=^opsin+\(SWS1\)^/and+Taxon+ID=^13146^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=^opsin+(SWS1)^/and+Taxon+ID=^8782^/or+Gene+Gephebase=^opsin+(SWS1)^/and+Taxon+ID=^13146^#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

@SeveralMutationsWithEffect