GEPHE SUMMARY

Gephebase Gene
OR7D4 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^OR7D4^#gephebase-summary-title)

GepheID
GP00000804

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

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

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

Trait State in Taxon A
Human/Chimpanzee ancestor

Trait State in Taxon B
Homo sapiens

Ancestral State
Taxon A

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

Taxon A

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

Common Name
-

Synonyms
Homo/Pan/Gorilla group

Rank
subfamily

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Euarchontoglires; Primates; Haplorrhini; Simiiformes; Catarrhini; Hominoidea; Hominidae

Parent
Hominidae (great apes) - (Rank: family) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9604)

NCBI Taxonomy ID
207598 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 207598)

is Taxon A an Infraspecies?
No

Taxon B

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

Common Name
human

Synonyms
human; man; Homo sapiens Linnaeus, 1758; Home sapiens; Homo sampiens; Homo sapeins; Homo sapian; Homo sapians; Homo sapien; Homo sapience; Homo sapiense; Homo sapients; Homo sapines; Homo spaiens; Homo spiens; Humo sapiens

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; Primates; Haplorrhini; Simiiformes; Catarrhini; Hominoidea; Hominidae; Homininae; Homo

Parent
Homo () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9605)

NCBI Taxonomy ID
9606 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9606)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
OR7D4

Synonyms
OR19B; hg105; OR19-7; OR19-B; OR7D4P

String
9606.ENSP00000310488 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=9606.ENSP00000310488)

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

GO - Molecular Function
GO:0004930 : G protein-coupled receptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004930)
GO:0004984 : olfactory receptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004984)

UniProtKB Homo sapiens
Q8NG98 (http://www.uniprot.org/uniprot/Q8NG98)

GenebankID or UniProtKB
ALI87882 (https://www.ncbi.nlm.nih.gov/nuccore/ALI87882)

GO - Biological Process

GO:0007186 : G protein-coupled receptor signaling pathway (https://www.ebi.ac.uk/QuickGO/term/GO:0007186)

GO - Cellular Component

GO:0016021 : integral component of membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0016021)
GO:0005886 : plasma membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0005886)

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

M273T

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	-	-	-

Main Reference

Dynamic functional evolution of an odorant receptor for sex-steroid-derived odors in primates. (2009) (https://pubmed.ncbi.nlm.nih.gov/19955411)

Authors

Zhuang H; Chien MS; Matsunami H

Abstract

Odorant receptors are among the fastest evolving genes in animals. However, little is known about the functional changes of individual odorant receptors during evolution. We have recently demonstrated a link between the in vitro function of a human odorant receptor, OR7D4, and in vivo olfactory perception of 2 steroidal ligands--androstenone and androstadienone--chemicals that are shown to affect physiological responses in humans. In this study, we analyzed the in vitro function of OR7D4 in primate evolution. Orthologs of OR7D4 were cloned from different primate species. Ancestral reconstruction allowed us to reconstitute additional putative OR7D4 orthologs in hypothetical ancestral species. Functional analysis of these orthologs showed an extremely diverse range of OR7D4 responses to the ligands in various primate species. Functional analysis of the nonsynonymous changes in the Old World Monkey and Great Ape lineages revealed a number of sites causing increases or decreases in sensitivity. We found that the majority of the functionally important residues in OR7D4 were not predicted by the maximum likelihood analysis detecting positive Darwinian selection.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

5 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^OR7D4^/and+Taxon ID=^207598^/or+Gene Gephebase=^OR7D4^/and+Taxon ID=^9606^#gephebase-summary-title)

EXTERNAL LINKS

COMMENTS