

GEPHE SUMMARY

<p>TAS2R38 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=TAS2R38^#gephebase-summary-title)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00001112</p> <p>Martin</p>	<p>GepheID</p> <p>Main curator</p>
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PHENOTYPIC CHANGE

<p>Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category=Physiology^#gephebase-summary-title)</p> <p>Taste sensitivity (bitter) (https://www.gephebase.org/search-criteria?/and+Trait=Taste+sensitivity+(bitter)^#gephebase-summary-title)</p> <p>Pan troglodytes Taster</p> <p>Pan troglodytes Non taster</p> <p>Data not curated</p> <p>Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=Intraspecific^#gephebase-summary-title)</p>	<p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p>	<p>Pan troglodytes Taster</p> <p>Pan troglodytes Non taster</p>
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Taxon A	Latin Name	Taxon B	Latin Name
Pan troglodytes (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Pan+troglyodytes^#gephebase-summary-title)	Pan troglodytes	Pan troglodytes (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Pan+troglyodytes^#gephebase-summary-title)	Pan troglodytes
chimpanzee	Common Name	chimpanzee	Common Name
chimpanzee; Chimpansee troglodytes	Synonyms	chimpanzee; Chimpansee troglodytes	Synonyms
species	Rank	species	Rank
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; Pan	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; Pan	Lineage
Pan (chimpanzees) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9596)	Parent	Pan (chimpanzees) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9596)	Parent
9598 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9598)	NCBI Taxonomy ID	9598 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9598)	NCBI Taxonomy ID
Yes	is Taxon A an Intraspecies?	Yes	is Taxon B an Intraspecies?
Pan troglodytes Taster	Taxon A Description	Pan troglodytes Non taster	Taxon B Description

GENOTYPIC CHANGE

<p>TAS2R38</p> <p>PTC; T2R38; T2R61; TH1OT</p> <p>9606.ENSP00000448219 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=9606.ENSP00000448219)</p> <p>Belongs to the G-protein coupled receptor T2R family.</p> <p>GO:0004930 : G protein-coupled receptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004930)</p> <p>GO:0033038 : bitter taste receptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0033038)</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p>	<p>P59533 (http://www.uniprot.org/uniprot/P59533)</p> <p>AFH77563 (https://www.ncbi.nlm.nih.gov/nuccore/AFH77563)</p> <p>UniProtKB Homo sapiens</p> <p>GenebankID or UniProtKB</p>
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GO - Biological Process

GO:0007186 : G protein-coupled receptor signaling pathway

(<https://www.ebi.ac.uk/QuickGO/term/GO:0007186>)

GO:0001580 : detection of chemical stimulus involved in sensory perception of bitter taste

(<https://www.ebi.ac.uk/QuickGO/term/GO:0001580>)

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

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

M1R; eliminates start codon; protein initiates at later Met. Protein apparently null for signalling

Experimental Evidence

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

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Main Reference

Independent evolution of bitter-taste sensitivity in humans and chimpanzees. (2006) (<https://pubmed.ncbi.nlm.nih.gov/16612383>)

Authors

Wooding S; Bufe B; Grassi C; Howard MT; Stone AC; Vazquez M; Dunn DM; Meyerhof W; Weiss RB; Bamshad MJ

Abstract

It was reported over 65 years ago that chimpanzees, like humans, vary in taste sensitivity to the bitter compound phenylthiocarbamide (PTC). This was suggested to be the result of a shared balanced polymorphism, defining the first, and now classic, example of the effects of balancing selection in great apes. In humans, variable PTC sensitivity is largely controlled by the segregation of two common alleles at the TAS2R38 locus, which encode receptor variants with different ligand affinities. Here we show that PTC taste sensitivity in chimpanzees is also controlled by two common alleles of TAS2R38; however, neither of these alleles is shared with humans. Instead, a mutation of the initiation codon results in the use of an alternative downstream start codon and production of a truncated receptor variant that fails to respond to PTC in vitro. Association testing of PTC sensitivity in a cohort of captive chimpanzees confirmed that chimpanzee TAS2R38 genotype accurately predicts taster status in vivo. Therefore, although Fisher et al.'s observations were accurate, their explanation was wrong. Humans and chimpanzees share variable taste sensitivity to bitter compounds mediated by PTC receptor variants, but the molecular basis of this variation has arisen twice, independently, in the two species.

Additional References

RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS

@BalancingSelection