

# GEPHE SUMMARY

TAS1R1 ( <a href="https://www.gephebase.org/search-criteria?/and+Gene">https://www.gephebase.org/search-criteria?/and+Gene</a> Gephebase=^TAS1R1^#gephebase-summary-title)	Gephebase Gene GP00001416	GephelD Main curator
Published	Entry Status Courtier	

## PHENOTYPIC CHANGE

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

Taste sensitivity (umami) (<https://www.gephebase.org/search-criteria?/and+Trait=^Taste>  
sensitivity (umami)^#gephebase-summary-title)

Trait State in Taxon A

-  
-  
-  
Ancestral State

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

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

polar bear  
Common Name  
Thalarctos maritimus; polar bear; white bear

species  
Rank  
Lineage  
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia;  
Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii;  
Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria;  
Laurasiatheria; Carnivora; Caniformia; Ursidae; Ursus

Parent  
Ursus () - (Rank: genus)  
(<https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9639>)  
NCBI Taxonomy ID  
29073

(<https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 29073>)  
is Taxon A an Infraspecies?  
No

Taxon B  
Latin Name

Ailuropoda melanoleuca  
(<https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Ailuropoda>  
melanoleuca^#gephebase-summary-title)

giant panda  
Common Name  
giant panda; Ailuropoda melanoleuca (David, 1869); Ailuropoda melanoleuра

species  
Rank  
Lineage  
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia;  
Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii;  
Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria;  
Laurasiatheria; Carnivora; Caniformia; Ursidae; Ailuropoda

Parent  
Ailuropoda () - (Rank: genus)  
(<https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9645>)  
NCBI Taxonomy ID  
9646

(<https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9646>)  
is Taxon B an Infraspecies?  
No

## GENOTYPIC CHANGE

Tas1r1	Generic Gene Name Q99PG6 ( <a href="http://www.uniprot.org/uniprot/Q99PG6">http://www.uniprot.org/uniprot/Q99PG6</a> )	UniProtKB Mus musculus
TR1; T1r1; Gpr70; Tr1	Synonyms 0	GenebankID or UniProtKB
10090.ENSMUSP00000030792 ( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier=10090.ENSMUSP00000030792">http://string-db.org/newstring_cgi/show_network_section.pl?identifier=10090.ENSMUSP00000030792</a> )	String	
Belongs to the G-protein coupled receptor 3 family. TAS1R subfamily.	Sequence Similarities GO - Molecular Function GO:0004930 : G protein-coupled receptor activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0004930">https://www.ebi.ac.uk/QuickGO/term/GO:0004930</a> ) GO:0008527 : taste receptor activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0008527">https://www.ebi.ac.uk/QuickGO/term/GO:0008527</a> ) GO - Biological Process GO:0050917 : sensory perception of umami taste ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0050917">https://www.ebi.ac.uk/QuickGO/term/GO:0050917</a> )	
	GO - Cellular Component	

GO:0005887 : integral component of plasma membrane  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0005887>)

Yes ([#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=^Yes))

Presumptive Null

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

Molecular Type

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

Aberration Type

-

Molecular Details of the Mutation  
pseudogene due to three indel mutations in the third and sixth exons. The giant panda has one 2-bp insertion on the third exon and two deletions (6-bp and 4-bp) on the sixth exon,

Experimental Evidence

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

Main Reference

The sequence and de novo assembly of the giant panda genome. (2010) (<https://pubmed.ncbi.nlm.nih.gov/20010809>)

Authors

Li R; Fan W; Tian G; Zhu H; He L; Cai J; Huang Q; Cai Q; Li B; Bai Y; Zhang Z; Zhang Y; Wang W; Li J; Wei F; Li H; Jian M; Li J; Zhang Z; Nielsen R; Li D; Gu W; Yang Z; Xuan Z; Ryder OA; Leung FC; Zhou Y; Cao J; Sun X; Fu Y; Fang X; Guo X; Wang B; Hou R; Shen F; Mu B; Ni P; Lin R; Qian W; Wang G; Yu C; Nie W; Wang J; Wu Z; Liang H; Min J; Wu Q; Cheng S; Ruan J; Wang M; Shi Z; Wen M; Liu B; Ren X; Zheng H; Dong D; Cook K; Shan G; Zhang H; Kosiol C; Xie X; Lu Z; Zheng H; Li Y; Steiner CC; Lam TT; Lin S; Zhang Q; Li G; Tian J; Gong T; Liu H; Zhang D; Fang L; Ye C; Zhang J; Hu W; Xu A; Ren Y; Zhang G; Bruford MW; Li Q; Ma L; Guo Y; An N; Hu Y; Zheng Y; Shi Y; Li Z; Liu Q; Chen Y; Zhao J; Qu N; Zhao S; Tian F; Wang X; Wang H; Xu L; Liu X; Vinar T; Wang Y; Lam TW; Yiu SM; Liu S; Zhang H; Li D; Huang Y; Wang X; Yang G; Jiang Z; Wang J; Qin N; Li L; Li J; Bolund L; Kristiansen K; Wong GK; Olson M; Zhang X; Li S; Yang H; Wang J; Wang J

Abstract

Using next-generation sequencing technology alone, we have successfully generated and assembled a draft sequence of the giant panda genome. The assembled contigs (2.25 gigabases (Gb)) cover approximately 94% of the whole genome, and the remaining gaps (0.05 Gb) seem to contain carnivore-specific repeats and tandem repeats. Comparisons with the dog and human showed that the panda genome has a lower divergence rate. The assessment of panda genes potentially underlying some of its unique traits indicated that its bamboo diet might be more dependent on its gut microbiome than its own genetic composition. We also identified more than 2.7 million heterozygous single nucleotide polymorphisms in the diploid genome. Our data and analyses provide a foundation for promoting mammalian genetic research, and demonstrate the feasibility for using next-generation sequencing technologies for accurate, cost-effective and rapid de novo assembly of large eukaryotic genomes.

Additional References

Comparative genomics reveals convergent evolution between the bamboo-eating giant and red pandas. (2017) (<https://pubmed.ncbi.nlm.nih.gov/28096377>)

Pseudogenization of the umami taste receptor gene Tas1r1 in the giant panda coincided with its dietary switch to bamboo. (2010) (<https://pubmed.ncbi.nlm.nih.gov/20573776>)

## RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

1 (<https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=^TAS1R1^/and+Taxon+ID=^29073^/or+Gene+Gephebase=^TAS1R1^/and+Taxon+ID=^9646^#gephebase-summary-title>)

## EXTERNAL LINKS

## COMMENTS

Note that the derived phenotype may have appeared during evolution due to another mutation; and that the mutation described here might have occurred subsequently; as a neutral mutation.