COMPARATIVE GENE ANALYSIS USING NCBI

OBJECTIVE – COMPARE THE BRCA1 GENE IN HUMAN VS MOUSE

STEPS

1 VISIT NCBI GENE

2 search for BRCA1 homo sapiens

**Official Symbol**

BRCA1provided by [HGNC](http://www.genenames.org/)

**Official Full Name**

BRCA1 DNA repair associatedprovided by [HGNC](http://www.genenames.org/)

**Primary source**

[HGNC:HGNC:1100](https://www.genenames.org/data/gene-symbol-report/#!/hgnc_id/HGNC:1100)

**See related**

[Ensembl:ENSG00000012048](http://www.ensembl.org/id/ENSG00000012048) [MIM:113705;](https://www.ncbi.nlm.nih.gov/omim/113705) [AllianceGenome:HGNC:1100](https://www.alliancegenome.org/gene/HGNC:1100)

**Gene type**

protein coding

**RefSeq status**

REVIEWED

**Organism**

[Homo sapiens](https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9606)

**Lineage**

Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Primates; Haplorrhini; Catarrhini; Hominidae; Homo

**Also known as**

IRIS; PSCP; BRCAI; BRCC1; FANCS; PNCA4; RNF53; BROVCA1; PPP1R53

**Summary**

This gene encodes a 190 kD nuclear phosphoprotein that plays a role in maintaining genomic stability, and it also acts as a tumor suppressor. The BRCA1 gene contains 22 exons spanning about 110 kb of DNA. The encoded protein combines with other tumor suppressors, DNA damage sensors, and signal transducers to form a large multi-subunit protein complex known as the BRCA1-associated genome surveillance complex (BASC). This gene product associates with RNA polymerase II, and through the C-terminal domain, also interacts with histone deacetylase complexes. This protein thus plays a role in transcription, DNA repair of double-stranded breaks, and recombination. Mutations in this gene are responsible for approximately 40% of inherited breast cancers and more than 80% of inherited breast and ovarian cancers. Alternative splicing plays a role in modulating the subcellular localization and physiological function of this gene. Many alternatively spliced transcript variants, some of which are disease-associated mutations, have been described for this gene, but the full-length natures of only some of these variants has been described. A related pseudogene, which is also located on

chromosome 17, has been identified. [provided by RefSeq, May 2020]

3 search for mouse

**Gt(ROSA)26Sor gene trap ROSA 26, Philippe Soriano [ *Mus musculus* (house mouse) ]**

**Official Symbol**

Gt(ROSA)26Sorprovided by [MGI](http://www.informatics.jax.org/mgihome/nomen/)

**Official Full Name**

gene trap ROSA 26, Philippe Sorianoprovided by [MGI](http://www.informatics.jax.org/mgihome/nomen/)

**Primary source**

[MGI:MGI:104735](http://www.informatics.jax.org/marker/MGI:104735)

**See related**

[Ensembl:ENSMUSG00000086429](http://www.ensembl.org/id/ENSMUSG00000086429) [AllianceGenome:MGI:104735](https://www.alliancegenome.org/gene/MGI:104735)

**Gene type**

ncRNA

**RefSeq status**

VALIDATED

**Organism**

[Mus musculus](https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=10090)

**Lineage**

Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria;

Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

**Also known as**

R26; ROSA26; Gtrgeo26; Gtrosa26; Thumpd3as1

**Summary**

This gene produces a long non-coding RNA (lncRNA) that is under the control of a constitutive promoter. This locus is a widely used site for the integration of transgenes and reporter constructs. [provided by RefSeq, Oct 2015]

**Expression**

Ubiquitous expression in bladder adult (RPKM 11.4), liver

KEY DIFFERENCES BETWEEN THEM

BRCA1 is a functional human gene crucial for DNA repair, often mutated in breast and ovarian cancers. In contrast, Gt(ROSA)26Sor is a mouse genomic locus used as a safe site for inserting foreign DNA. While BRCA1 has a biological role, ROSA26 serves as a molecular tool in transgenic research. Both are essential in biomedical science but differ in function, species, and research usage.