

## S2-09

### Rešitve

Pri sekvenciranju fragmenta nekega proteina ste dobili naslednje aminokislinsko zaporedje:

TSVGEVREVLALARQQNKVKVVGGGHSPSDIACDGFMIHMGKMNRVLQVDKEKKQVTVEA  
GILLTDLHPQLDKHGLALSNLGAVSDVTGGVIGSGTHNTGIKHGILATQVVALTLMKADGTVLE  
CSESSNADV FQAARVHLGCLGVILTVTLQCVPQFHLLSFSTLKEVLDNLDSHLKKSEYFRFL  
WFP.

- Kateremu proteinu pripada ta fragment in iz katere vrste izvira ta protein?

Fragment pripada encimu L-gulonolakton oksidazi, ki izvira iz miši. To določimo s protein blastom.

BLAST® » blastp suite » results for RID-QJWRK2SA014

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How to read this report? BLAST Help Videos Back to Traditional Results Page

Job Title: Protein Sequence  
RID: QJWRK2SA014 Search expires on 05-18 15:49 pm Download All

Program: BLASTP Citation

Database: ClusteredNR See details

Query ID: lcl|Query\_11807294

Description: unnamed protein product

Molecule type: amino acid

Query Length: 195

Other reports: Distance tree of results Multiple alignment MSA viewer

**Filter Results**

Organism only top 20 will appear NEW

Type common name, binomial, taxid or group name

+ Add organism

Percent Identity: [ ] to [ ] E value: [ ] to [ ] Query Coverage: [ ] to [ ]

Filter Reset

Clusters Graphic Summary Alignments Taxonomy

Clusters producing significant alignments Download Select columns Show 100

select all 100 clusters selected GenPept Graphics Distance tree of results Multiple alignment MSA Viewer

Cluster Composition	Cluster Ancestor	Cluster Representative Sequence	Max Score	Total Score	Query Cover	E value	Per. Ident	Acc. Len	Accession
25 member(s), 21 organism(s) rodents		L-gulonolactone oxidase (Mus musculus)	398	398	100%	3e-136	100.00%	440	NP_848862.1
1 member(s), 1 organism(s) Eurasian red squirrel		L-gulonolactone oxidase (Sciurus vulgaris)	385	385	100%	1e-129	95.90%	547	XP_078997407.1
191 member(s), 153 organism(s) placentals		L-gulonolactone oxidase (Bos taurus)	376	376	100%	2e-127	93.33%	440	NP_001029215.1
1 member(s), 1 organism(s) donkey		L-gulonolactone oxidase isoform X3 (Equus asinus)	375	375	100%	2e-127	92.31%	416	XP_070381254.1

- Poiščite izvoren mRNA transkript tega proteina.

Izvoren mRNA se nahaja na genebanku:

[https://www.ncbi.nlm.nih.gov/nuccore/NM\\_178747.3](https://www.ncbi.nlm.nih.gov/nuccore/NM_178747.3)

- Kakšna je biološka vloga tega proteina.

L-gulonolakton oksidaza katalizira zadnjo stopnjo pri sintezi vitamina C. Oksidira L-gulono-1,4-lakton v vodikov peroksid in L-ksilo-heksulonolakton, ki nato spontano izomerizira v L-askorbat.

- Kateri gen kodira za dano mRNA in na katerem kromosomu se nahaja? Poiščite njegovo nukleotidno zaporedje.

Gen GULO, ki se pri miši nahaja na kromosomu 14. Nukleotidno zaporedje lahko prenesemo iz genebanka: <https://www.ncbi.nlm.nih.gov/datasets/gene/268756/>

-Ali obstaja homologno nukleotidno zaporedje tudi pri človeku in na katerem kromosomu se nahaja? Poiščite ga. Pri iskanju si pomagajte s BLAST/BLAT orodjem v Ensembl (<https://www.ensembl.org/Multi/Tools/Blast?db=core>).

Da, to je pseudogen GULOP, ki se nahaja na kromosomu 8. Najdemo ga s Ensembl BLAT, kot izvorno zaporedje uporabimo nukleotidno zaporedje mišjega gena GULO v FASTA formatu, ki si ga naložimo iz genbanka preko linka pri prejšnjem vprašanju.

Results for NC\_000080.7:c66246703-66224235 Gulo [organism=Mus musculus] [GeneID=268756] [chromosome=14]

Job details

Job name NC\_000080.7:c66246703-66224235 Gulo [organism=Mus musculus] [GeneID=268756] [chromosome=14]

Species Human (Homo sapiens)

Assembly GRCh38

Search type BLAT

Download results file New job

Results table

Genomic Location	Overlapping Gene(s)	Orientation	Query start	Query end	Length	Score	E-val	%ID
827560271-27560381	GULO	Forward	5070	5180	111	174.0	1.5e-43	85.59
K1270752.1.3516-3599		Reverse	19072	19155	84	143.0	3.2e-34	90.48
K1270752.1.3516-3599		Reverse	1790	1873	84	143.0	3.7e-34	90.48
K1270752.1.20615-20701		Reverse	18292	18377	87	141.0	9.0e-34	90.80
K1270752.1.20615-20700		Forward	19087	19171	88	118.0	9.3e-27	86.36
2.5371354-5371410	ENSG00000308446	Reverse	13487	13543	57	103.0	4.2e-22	96.49
1.234577455-234577509	ENSG00000285210	Reverse	19122	19175	55	91.0	9.8e-19	94.55
2.10744778-10744833	ATP6V1C2	Forward	1840	1894	56	91.0	1.0e-18	92.86
2.10744778-10744829	ATP6V1C2	Reverse	18292	18342	52	83.0	2.4e-16	92.31
1.178296030-178296074	RASAL2	Forward	13544	13588	45	81.0	1.1e-15	95.56
1.9227507-9227553		Forward	7648	7693	47	80.0	2.4e-15	95.74
1.27087038-27087077		Reverse	13489	13528	40	78.0	8.0e-15	100.00
K1270752.1.3606-3648		Reverse	1740	1784	45	71.0	1.6e-12	93.33
1.45735323-45735363	ENSG00000302565, IPP	Forward	19117	19156	41	70.0	2.5e-12	97.56

Human (GRCh38.p14)

Location: 8:27,560,274-27,589,073 Gene: GULO Transcript: GULO.201 Jobs

Gene-based displays

Summary

- Splice variants
- Transcript comparison
- Gene alleles
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- Comparative Genomics
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- Gene tree
- Gene gain/loss tree
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- Pathway
- Molecular interactions
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- ID History
- Gene history

Gene: GULO ENSG00000234770

Description gulonolactone (L-) oxidase, pseudogene [Source:HGNC Symbol;Acc:HGNC:4695-6]

Gene Synonyms GULO, SCURVY

Location Chromosome 8: 27,560,274-27,589,073 forward strand GRCh38 CM000670.2

About this gene This gene has 1 transcript (splice variant).

Transcripts Show transcript table

Summary

Name GULO.201 (HGNC Symbol)

RefSeq This Ensembl/Gencode gene does not contain any transcripts for which we have selected identical model(s) in RefSeq. If there are other RefSeq transcripts available they will be in the External references table.

Ensembl version ENSG00000234770.1

Other assemblies This gene maps to 27,417,791-27,446,590 in GRCh37 coordinates. View this locus in the GRCh37 archive: ENSG00000234770

Gene type Unitary pseudogene

Annotation method Manual annotation (determined on a case-by-case basis) from the Havana project.

Go to Region in Detail for more tracks and navigation options (e.g. zooming)

Add/remove tracks Custom tracks Share Resize image Export image Reset configuration Reset track order

- Kakšna je biološka vloga tega gena pri človeku? Ima vlogo pri kakšnem bolezenskem stanju? Kako imenujemo taka nukleotidna zaporedja v genomu?

