

GSLC Computational Biology Sesi 9

Nama : Steven Chowina

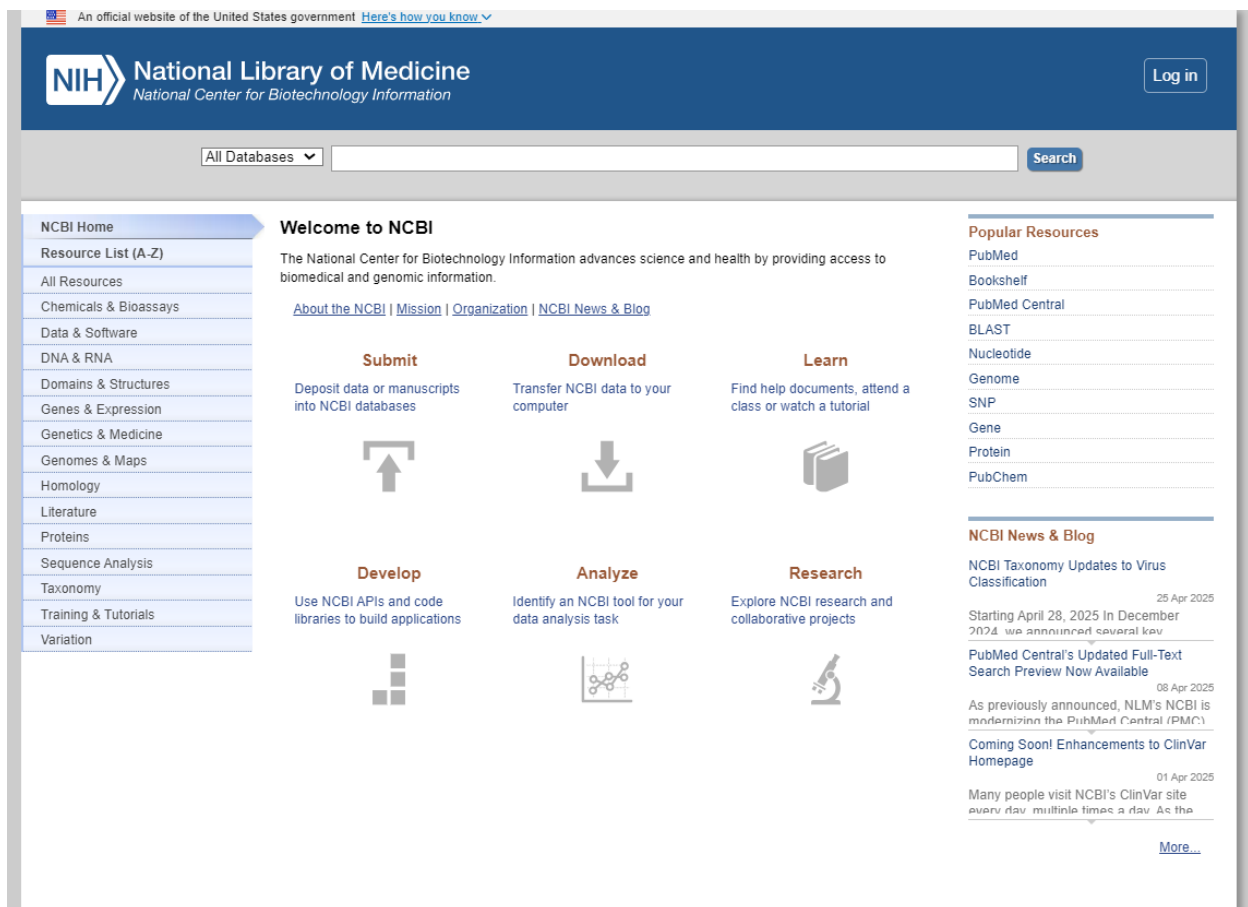
NIM : 2702295373

Kelas : LP01

Berdasarkan video PPT Bioinformatics Database (sesi 8) slide ke 19

(<https://youtu.be/RPyhYraPcog?si=0bTW4agTxOt8A4Zt>) tentang cara mengakses data dan mencari nukleotida di GenBank NCBI, kita dapat melakukan beberapa langkah berikut:

1. Akses link berikut terlebih dahulu: <https://www.ncbi.nlm.nih.gov/>.



2. Sekarang kita akan ganti database nya menjadi gene lalu kita masukkan nama gene yang kita ingin cari. Disini saya akan gunakan ACE2 (Angiotensin-Converting Enzyme 2) karena gen ini memiliki peran penting dalam sistem kardiovaskular dan menjadi sangat relevan dalam studi virologi, khususnya sejak pandemi COVID-19. ACE2 merupakan reseptor utama yang digunakan oleh virus SARS-CoV-2 untuk masuk ke dalam sel manusia.

GENE

Was this helpful?



ACE2 – angiotensin converting enzyme 2

Homo sapiens (human)

Also known as: ACEH

Gene ID: 59272

RefSeq products

Orthologs

Genome Data Viewer

clear

New - Visualize gene across multiple species

RefSeq Sequences



Full Report

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ACE2 angiotensin converting enzyme 2 [*Homo sapiens* (human)]

Gene ID: 59272, updated on 3-May-2025

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General protein information
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Summary

Official Symbol

ACE2 provided by HGNC

Official Full Name

angiotensin converting enzyme 2 provided by HGNC

Primary source

HGNC:HGNC:13557

See related

Ensembl:ENSG00000130234 MIM:300335 AllianceGenome:HGNC:13557

Gene type

protein coding

RefSeq status

REVIEWED

Organism

Homo sapiens

Lineage

Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi, Mammalia, Eutheria, Euarchontoglires, Primates, Haplorhini, Catarrhini, Hominidae, Homo

Also known as

ACEH

Summary

The protein encoded by this gene belongs to the angiotensin-converting enzyme family of dipeptidyl carboxypeptidases and has considerable homology to human angiotensin 1 converting enzyme. This secreted protein catalyzes the cleavage of angiotensin I into angiotensin 1-9, and angiotensin II into the vasodilator angiotensin 1-7. ACE2 is known to be expressed in various human organs, and its organ- and cell-specific expression suggests that it may play a role in the regulation of cardiovascular and renal function, as well as fertility. In addition, the encoded protein is a functional receptor for the spike glycoprotein of the human coronavirus HCoV-NL63 and the human severe acute respiratory syndrome coronaviruses, SARS-CoV and SARS-CoV-2, the latter is the causative agent of coronavirus disease-2019 (COVID-19). Multiple splice variants have been found for this gene and the dACE2 (or MIRb-ACE2) splice variant has been found to be interferon inducible. (provided by RefSeq, Nov 2020)

Annotation information

Note: This gene has been reviewed for its involvement in coronavirus biology, and is involved in SARS-CoV-2 infection.

Expression

Biased expression in small intestine (RPKM 93.7), duodenum (RPKM 69.0) and 5 other tissues [See more](#)

Orthologs

[mouse](#) [all](#)

NEW

[Try the new Gene table](#)

[Try the new Transcript table](#)

Genomic context

Location: Xp22.2

See ACE2 in [Genome Data Viewer](#)

Exon count: 22

Annotation release	Status	Assembly	Chr	Location
RS_2024_08	current	GRCh38.p14 (GCF_000001405.40)	X	NC_000023.11 (15518197..15607211, complement)
RS_2024_08	current	T2T-CHM13v2.0 (GCF_009914755.1)	X	NC_060947.1 (15101170..15190203, complement)
RS_2024_09	previous assembly	GRCh37.p13 (GCF_000001405.25)	X	NC_000023.10 (15536320..15625334, complement)

Genome Browsers
Genome Data Viewer
Variation Viewer (GRCh37 p13)
Variation Viewer (GRCh38)
Ensembl
UCSC
Related Information
3D structures

Genomic regions, transcripts, and products

Go to [reference sequence details](#)

Genomic Sequence: Chromosome X Reference GRCh38.p14 Primary Assembly

Go to nucleotide: [Graphics](#) [FASTA](#) [GenBank](#)


Genes, RefSeq Project (release v1.4)

NCBI RefSeq Annotation GCF_000001405.40-RS_2024_08


Biological regions, aggregate, NCBI RefSeq Annotation GCF_000001405.40-RS_2024_08

Genes, Ensembl release 113

4. Sekarang kita pergi saja ke mRNA and Proteins yang pertama (angiotensin-converting enzyme 2 isoform 1 precursor).

 **NCBI Reference Sequences (RefSeq)**

NEW Try the new [Transcript table](#)

 **RefSeqs maintained independently of Annotated Genomes**

These reference sequences exist independently of genome builds. [Explain](#)

Genomic

1. NG_012575.3 RefSeqGene

Range	11251..51178
Download	GenBank , FASTA , Sequence Viewer (Graphics)

mRNA and Protein(s)

1. [NM_001371415.1](#) → [NP_001358344.1](#) angiotensin-converting enzyme 2 isoform 1 precursor

Status: REVIEWED

Description	Transcript Variant: This variant (1) encodes the longest isoform (1). Variants 1 and 2 encode the same isoform.	
Source sequence(s)	AC097625	
Consensus CDS	CCDS14169.1	
UniProtKB/Swiss-Prot	A0A7D6JAD5 , C7ECU1 , Q6UWP0 , Q86WT0 , Q9BYF1 , Q9NRA7 , Q9UFZ6	
UniProtKB/TrEMBL	A0A8S0M502 , B2RCJ5	
Related	ENSP00000252519.3 , ENST00000252519.8	

Conserved Domains (2) [summary](#)

	pfam01401 Location:19 → 606	Peptidase_M2; Angiotensin-converting enzyme
	pfam16959 Location:617 → 770	Collectrin; Renal amino acid transporter

5. Sekarang kita klik saja FASTA untuk melihat Sequence nya.

Nucleotide

Nucleotide

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Analyze this sequence

Articles about the ACE2 gene

Reference sequence information

Homo sapiens angiotensin converting enzyme 2 (ACE2), transcript variant 1, mRNA

NCBI Reference Sequence: NM_001371415.1

[FASTA](#) [Graphics](#)

[Go to](#)

LOCUS	NM_001371415	3339 bp	mRNA	linear	PRI 27-MAR-2025
DEFINITION	Homo sapiens angiotensin converting enzyme 2 (ACE2), transcript variant 1, mRNA.				
ACCESSION	NM_001371415				
VERSION	NM_001371415.1				
KEYWORDS	RefSeq; MANE Select.				
SOURCE	Homo sapiens (human)				
ORGANISM	Homo sapiens Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Primates; Haplorhini; Catarrhini; Hominidae; Homo.				
REFERENCE	1 (bases 1 to 3339)				
AUTHORS	Do, T.L., Tachibana, K., Yamamoto, N., Ando, K., Isoda, T. and Kihara, T.				
TITLE	Interaction of SARS-CoV-2 Spike protein with ACE2 induces cortical actin modulation, including dephosphorylation of ERM proteins and reduction of cortical stiffness				
JOURNAL	Hum Cell 38 (1), 3 (2024)				
PUBMED	39436480				
REMARK	GeneRIF: Interaction of SARS-CoV-2 Spike protein with ACE2 induces cortical actin modulation, including dephosphorylation of ERM proteins and reduction of cortical stiffness. Publication Status: Online-Only				
REFERENCE	2 (bases 1 to 3339)				
AUTHORS	Thiede, J.M., Dick, J.K., Jarjour, N.N., Krishna, V.D., Qian, L., Sangala, J., Benzow, K., Karanjeet, K., Chin, S., Rainwater, O., Cheeran, M.C., Hogquist, K.A., Jameson, S.C., Hart, G.T., Bold, T.D. and Koob, M.D.				

Run BLAST

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Show in Genome Data Viewer

Tight junction protein LSR is a host defense factor against SARS-CoV-2 infec [EMBO J. 2024]

Interaction of SARS-CoV-2 Spike protein with ACE2 induces cortical actin mod [Hum Cell. 2024]

Protein Nanoparticles for Targeted SARS-CoV-2 Trapping and Neutraliz [Adv Healthc Mater. 2025]

See all...

RefSeq alternative splicing

See 6 reference mRNA sequence splice variants for the ACE2 gene.

RefSeq protein product

See the reference protein sequence for aniotensin-converting enzyme 2 isoform 1

Nucleotide

Nucleotide

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Reference sequence information

Homo sapiens angiotensin converting enzyme 2 (ACE2), transcript variant 1, mRNA

NCBI Reference Sequence: NM_001371415.1

[GenBank](#) [Graphics](#)

>NM_001371415.1 Homo sapiens angiotensin converting enzyme 2 (ACE2), transcript variant 1, mRNA

```
AGTCTAGGGAAAGTCATTCACTGAGTGTGATCTTGGCTCACAGGGGACGATGTCAAGCTCTTCTGGCTC
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CACCATCTACAGTACTGGAAAAGTTTGAACCCAGATAATCCACAAGAAATGCTTATTACTTGAACAGGT
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AGCCGCGGCAGTTGATTGAAGATGTGGAACATACCTTTGAAGAGATTAAACCATTTATGAACATCTTC
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GAAAAGTGGTGGGAGATGAAGCAGAGATAGTTGGGTGGTGGAACTGTGCCCATGATGAACATAC
TGTGACCCCGCATCTGTTCCATGTTTCTAATGATTACTCATTTCATTCGATATACACAAGGACCTTT
ACCAATCTCACTTTGAGAGAGCTTTGTCAGCAGCTTAAATGAGGCTCTGCAAAATGGAGAT
```

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Tight junction protein LSR is a host defense factor against SARS-CoV-2 infec [EMBO J. 2024]

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Protein Nanoparticles for Targeted SARS-CoV-2 Trapping and Neutraliz [Adv Healthc Mater. 2025]

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RefSeq alternative splicing

See 6 reference mRNA sequence splice variants for the ACE2 gene.

RefSeq protein product

See the reference protein sequence for

FASTA

Homo sapiens angiotensin converting enzyme 2 (ACE2), transcript variant 1, mRNA

NCBI Reference Sequence: NM_001371415.1

[GenBank](#) [Graphics](#)

>NM_001371415.1 Homo sapiens angiotensin converting enzyme 2 (ACE2), transcript variant 1, mRNA

```
AGTCTAGGGAAGTCATTCAAGTGGATGTGATCTTGCTCACAGGGGACGATGTCAAGCTCTTCTGGCTC
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AGTTTAACCCAGAACGCGGAAGACCTGTTCTATCAAAGTTCAGTCTGCTTCTTGAATATTAAACCAATAT
TACTGAAGAGAATGCTCCAAACATGAATAATGCTGGGGACAAATGGTCTGCCTTTTAAAGGAACAGTCC
ACACTTGGCCAAATGTATCCACTACAAGAAATTCAGAATCTCACAGTCAAGCTTCAGCTGCAGGCTCTTC
AGCAAAATGGGCTTTCAGTGTCTCAGAAGACAAGAGCAAAACGGTTGAACACAATTTCAATACAATGAG
CACCATCTACAGTATGGAAAAGTTTGTAAACAGATAATCCACAAGAAATGCTTATTACTTTGAACAGGTT
TTGAATGAAATATGGCAAAACAGTTTGAAGTACAATGAGAGGCTCTGGGCTTGGGAAAGCTGGAGATCTG
```

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