**Basic Local Alignment Search Tool**

BLAST finds regions of similarity between biological sequences. The program compares nucleotide or protein sequences to sequence databases and calculates the statistical significance.

<https://blast.ncbi.nlm.nih.gov/Blast.cgi>

<https://www.genome.jp/tools/blast/>

<https://web.expasy.org/blast/>

<https://www.ebi.ac.uk/services>

<https://www.uniprot.org/>

Sequence 1

GGATCCTGTTATGTGCATTTACAGCTACAGATGCAGACACAATATGTATAGGCTACCATGCGAACAACTC

AACCGACACTGTTGACACAGTACTTGAGAAGAACGTGACAGTGACACACTCTGTCAACCTACTTGAGGAC

AGTCACAACAGAAAACTATGTCGACTAAAAGGAATAGCCCCACTACAATTGGGTAATTGCAGCATTGCCG

GATGGATCTTAGGAAACCCAGAATGCGAATCACTGTTTTCTAAGGAATCATGGTCCTACATTGCAGAAAC

ACCAAACTCCGAGAATGGAACATGTTACCCAGGGTATTTCGCCGACTATGAGGAACTGAGGGAGCAATTG

AGTTCAGTATCATCATTCGAGGGATTCGAAATATTCCCCGAAGAAAGCTCATGGCCCAACCACACCGTAA

CCAAGGGAGTAACGGCATCATGCTCCCATAATGGGAAAAGCAGTTTTTACAGAAATTTGCTATGGCTGAC

GGAGAAGAATGGCTTGTACCCAAATCTGAGCAAGTCCTATGTAAACAACAAAGAGAAAGAAGTCCTTGTA

CTATGGGGTGTTCATCACCCGTCTAACATAGGGGACCAAAGGGCCATCTATCATACAGAAAATGCTTATG

TCTCTGTAGTGTCTTCACATTATAGCAGGAGATTCACCCCAGAAATAGCAAAAAGACCCAAAGTAAGAGA

TCAAGAAGGAAGAATTAACTACTACTGGACTCTGCTGGAACCCGGGGACACAATAATATTTGAGGCAAAT

GGAAATCTAATAGCGCCATGGTATGCTTTCGCACTGAGTAGAGGCTTTGGGTCAGGAATCATCACCTCAA

ACGCATCAATGGATGAATGTGACGCGAAGTGTCAAACACCCCAGGGAGCTATAAACAGTAGTCTTCCTTT

CCAGAATGTACACCCAGTCACAATAGGAGAGTGTCCAAAGTATGTCAGGAGTACAAAATTAAGGATGGTT

ACAGGACTAAGGAACATCCCATCCATTCAATCCAGAGGTTTGTTTGGAGCCATTGCCGGTTTCATTGAAG

GGGGATGGACTGGAATTC

Резултат

<https://blast.ncbi.nlm.nih.gov/Blast.cgi>

[Influenza A virus (A/NIB/4/1988(H1N1)) gene for polyprotein, genomic RNA](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_59294)

[Influenza A virus (A/Siena/10/1989(H1N1)) segment 4, complete sequence](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_218664171)

<https://www.genome.jp/tools/blast/>

HA, FLUAVs4gp1; Influenza A virus (A/Puerto Rico/8...

HA, UJ99\_s4gp1; Influenza A virus (A/California/...

<https://www.uniprot.org/>

**Hemagglutinin** (Influenza A virus (strain A/…)

Sequence 2

ATGAAAGCAAAACTACTGGTCCTGTTATGTGCACTTTCAGCTACAGATGCAGACACAATATGTATAGGCT

ACCATGCGAACAACTCAACCGACACTGTTGACACAGTACTCGAAAAGAACGTGACAGTGACACACTCTGT

CAACCTACTTGAGGACAGTCACAACGGAAAACTATGCAGACTAAAAGGAATAGCCCCACTACAATTAGGG

AAATGCAACATTGCCGGATGGATCTTAGGAAACCCAGAATGCGAATCACTGTTTTCTAAGAAATCATGGT

CCTACATTGCAGAAACACCAAACTCCGAGAATGGAACATGTTACCCAGGATATTTCGCCGACTATGAGGA

ATTGAGGGAGCAATTGAGCTCAGTATCATCATTCGAGAGATTCGAAATATTCCCCAAGGAAAGATCATGG

CCCAAACACAACGTAACCAGAGGCGTAACGGCATCATGCTCCCATAAGGGGAAAAGCAGTTTTTACAGAA

ATTTGCTATGGCTGACGGAGGAAAATGGCTCGTACCCAAATCTGAGCAAGTCCTATGTGAACAACAAAGA

GAAAGAAGTCCTTGTACTATGGGGTGTTCATCACCCGTCTAACATAGAGGACCAAAAGACCATCTATCGG

AAAGAAAATGCTTATGTCTCTGTAGTGTCTTCAAATTATAACAGGAGATTCACCCCAGAAATAGCAGAAA

GACCCAAAGTAAGAGGTCAAGCAGGGAGAATTAACTACTACTGGACTCTGCTGGAACCCGGGGACACAAT

AATATTTGAGGCAAATGGAAATCTAATAGCGCCATGGCATGCTTTCGCACTGAATAGAGGCTTTGGGTCA

GGAATCATCACCTCAAACGCATCGATGGATGAATGTGACACGAAGTGTCAAACNCCCCAGGGAGCTATAA

ACAGTAGTCTTCCTTTCCAGAATATACACCCAGTCACAATAGGGGAGTGCCCAAAATACGTCAGGAGTAC

AAAATTGAGGATGGTTACAGGACTAAGGAACATCCCATCCATTCAATCCAGAGGTCTGTTTGGAGCCATT

GCCGGTTTCATTGA

Резултат

<https://blast.ncbi.nlm.nih.gov/Blast.cgi>

[Influenza A virus (A/USSR/90/1977(H1N1)) hemagglutinin gene HA1 region](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_60774)

[Influenza A virus (A/Memphis/20/1978(H1N1)) segment 4, complete sequence](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_118313001)

<https://www.uniprot.org/blast/>

**Hemagglutinin** (Influenza A virus (strain A/…)

Seq 3

MNPNQKIITIGSICMVVGIISLILQIGNIISIWVSHSIQTGNQNHPETCNQSIITYENNT

WVNQTYVNISNTNVVAGQDATSVILTGNSSLCPISGWAIYSKDNGIRIGSKGDVFVIREP

FISCSHLECRTFFLTQGALLNDKHSNGTVKDRSPYRTLMSCPVGEAPSPYNSRFESVAWS

ASACHDGMGWLTIGISGPDNGAVAVLKYNGIITDTIKSWRNNILRTQESECACVNGSCFT

IMTDGPSNGQASYKILKIEKGKVTKSIELNAPNYHYEECSCYPDTGKVMCVCRDNWHGSN

RPWVSFDQNLDYQIGYICSGVFGDNPRPNDGTGSCGPVSSNGANGIKGFSFRYDNGVWIG

RTKSTSSRSGFEMIWDPNGWTETDSSFSVRQDIVAITDWSGYSGSFVQHPELTGLDCMRP

CFWVELIRGQPKENTIWTSGSSISFCGVNSDTVGWSWPDGAELPFSIDK

Резултат

<https://blast.ncbi.nlm.nih.gov/Blast.cgi>

[RecName: Full=Neuraminidase [Influenza A virus (A/Brevig Mission/1/1918(H1N1))]](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_Q9IGQ6)

[neuraminidase [Influenza A virus (A/mallard/Alberta/46/1977(H1N1))]](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_ABB19521)

<https://www.uniprot.org/blast/>

**Neuraminidase** (Influenza A virus (strain A/…)

http://www.youtube.com/watch?v=YSgkoldBNkI

Seq 4

CTCGAGGATCGAATCTAAAAGAACTACGATTCTTCAATTTGAGTGCTTATCACAGTGAGG

GTGCTTTTCAAACGTTCAGCTTGCCCCCAGTTTTTGACTCAGTCTCTGGGGGTGTGGCTA

GCGATCTGAAGATTAATCCGCGTTAATTCGCACAGCAGGAAATGCTCTGCTGCCTACACG

CCCAAGAAGAGTAACTACTGCACCCACATCACCAAGGTTTAATAGCTGTATCTTCGGGAC

CCGCCACAGTCAACCCCCACGATGGTCAAGCTAGCCAGCTGCGCCCCAGGACAAGGTGAC

GGCAGCATCGTTTTTCTACCAGGATGCGGCCTGGAAACTGCTTCTCAGCCAGTTCCGCTA

TAACCATGCGGTCGCCCAGGGCAACCACAAGGTCGATGAGAAAGATCAAAGTGAATATGT

AACCAGTGCCTGGATCGAAGCTGGCGGACGTCTAATCAGTCAGTTGGAGGTTCAAAATCT

AAAAATGATACTTAAAGGAAGAAAGTAATTAACCCCCCACCCGCACCCTGGCAGATTCGC

GTCCGGGGGTGAAAGCGAGGGGCGGTACATCCGGGTCACGTGGGCTGACTGCTTTGACCT

TCCCCGCAGCTCGGCCATTTTGTCCCAGTCAGTCTCGAGCTGCGGCTGCGGAGGAAGCAC

CTCAAGGGGAGCTGCGAAGATGCTGTCCGTGCGCGTCGCCGCGGCCGTGGCCCGCGCCCT

CCCTCGGCGAGCGGGGCTGGTGAGCACGGGAGGCTGGCTGGAGGGAGGGTCCAGTCAGCG

GCGGGTGGCGATTGCATGGGCTCGGGCTCTCTTTCTGTGCAGAGGGTGAGGGGCTGTGGC

GGGTGGCGCCATCTTGCCCCGCTGGCCTCTCGGCTGGCCTGGGCTCTCGGAGAAGGGCTT

TCGCTCGGTGCCGGAGGGTGCAGGGTGCTGCAGGGGAGACAGTGACCTTCGTGGTGTCTT

GAGATGGCGCCTCGGGACGATTCCAGTCTTCGTCCGAGAGGCCGGAGAGGGGCCTTCGAT

GAAAGTCAGGGCTGGGGCGCTAGTTTCCCGAGGCCTGCTCCGAAACGGGGAGCCTGGGTC

CCACTGACTCTCCTGACTTCCTCGCTGAAGGTCAGAGCACTGTTGTCAGCCCGGGTTGAA

GCAAGGTAGGGAGCATTGCGTGAAGGTCAGCAGGCCCCGGCATTTCACCTCCTCCCGAGG

TCGGTTCAGAGAAAAGCAATAAGTGAAGGTGCCTTTCTGAATGCTTCAATATGCGCTCTC

TTAGTGCCGAATAGTGAAACGATCGTGAAAACACCGTATAGGTGCAAATATGCATTTCAG

TGCCGGCGCCACCCTGACAGCGGAGGAGCTGGCTTCCAGATTGTCTCAGACTGGCAGACT

TTAGTTGGTGGTGCTTTGACTTGTTTTTAAGATTTCATCCTTGAGGAATGTTAGTGATTG

AAAACTCAAGTAAAATAGAACATAGGGTTGGGAGATTCTTTTGAAGGTCAATGCCCTTCA

TCACTAAAATCCCTTGAAGTTAAGGACATTACCCCTAAAGGTTATGTAAACGTTTTGACA

TTTACTTGTGTTTTCATCTTGAGAGTAATCTCAGTTTGGAAAGCCAAATAAATTCATTGG

CCATTTACTGCCCTAACACAACCGCTGATAACATTTTGGATTTCTATTAACAAAAACAAA

AAAGAAGTACTCAAGGACAGTCATCCTAGTCCTGTAGAAGGGAACATCTTCAGAATATGC

CTTGACCAACCACAGTTGTAGAAGGAGGGTCCGGATTCCTGCAGGATTTGTTGAAGGGAG

TTTTTTTGAAAACGAAGTGCATATTGCCATATCTCTTAGTTTCTAACCAAACTCAACGTT

TAGAGGCTTTTTAAGATTAGAATAGAAAATCTATTGAGATTTGCCCCTTTTAGAAAGCAG

TTTATAAAATTGAGGATTTCCACAACTCAATTGAAATACATTTAAAGTCAAAGTAATATT

TATCTGGTGCCTTTAAAAGGAAAGATATATTGTTAGTGGTTGCTTTTTAGAATATGCTTT

TTTTTTTAAGTGTACTTACAGTGTACCTGGAATTGCATTAACAAATTTTCACATATATTG

ATAAATGCTTTCTCACGTGGTTACTATTTGTGCTGATAATTTAATCATACTAAGCCTGCA

TTTGTTTAAGCTTGCTAGTTTTATAAAGGCCCTTTTTTAAAAATCAGAGTTTTAAAGAAA

ATTTCTTGCACTAGGTCTCCAAAAATGCTTTGGGATCATCCTTCATTGCTGCAAGGAACC

TGCATGCCTCTAACTCTCGTCTGCAGAAGACCGGTAAGTCATTATTTCTGTGTCTGGACC

ACACTTACTACCTTGTTACTAAATGAAAAATGTCACGTAGGTTACATACCTGCTGGGAAT

ATTTTTTGGATTTTTTTCCATTAGTGAATTTTTTTCTCAATTTTAGTTACTGTGGAATTT

TAGATTCTGAACCCATAATATGCCATTTAGCTCTATTTTGGTAGGTTCCCTTCTAGTGAA

ATGAACTATGAGTATTTATTTCTCTTGATGGGAGCACAGGTTCTTTTTTTGTCATGATGA

ATGCTTCTTGGTCCTTATCAGTATATGTCAGGTGGTAGGCTCCTTTCTGACCTATGAACT

CTTTCCTAATAGACATTGGGAAAAGACAAGTAGTTTTTATGTGTTTCAAAAACAGGAACT

GGTAACCTATACCTGGCAGTCTGAATTTGCACATTGTAAATGCAATAGAGAAATCAGGAG

GTAAACTTAAGATTCTGTAGGTTGGGAAATTTTTTTGAGATGTGCATTAGGGCTTTTGAA

ATAGTTAGGTATCATCTGTATGCCAAGATGAGGAATGTAGTACATGCTTCCCTTGAAAGG

GAGAAATACAGCTTTTCATCACTATTTGAAAGTGGGTGTTCTAATGAAGTTTTTCTTTGG

CTGAAATGATTAAAGTGTGAAGAAGAAATTACCCTTTTTTGTCAAAGTGAAGTGACGTAA

ATGAACTTTCAAAATGGCAAGGGCTATCAGTACTTATATTTTGTTAAACAGTTGGGTTTT

TTTTGTTTTTGTTTTTGGCTGAGTGACTTGTGGTATCTTATTTTCCCCAGCAGGAACTGA

GCCTGGGCCCTTGGCACTGAAAGCATGGAGTCCTAGCCAGTGGACTGCCAGGGAATTCCT

AAGCTGTTGCCTTTTAAGATATACTTTTTATAGAATTTAGCCAAAAAATTCAAGTTTCAG

ATTTGTTAAGAGATTAAACCAAAGAATTAGGAGATAGAAAATACTTATTTTAGGGAGATT

GCTTAATTTGATTAGCTCCTTACCTGGTTTATGTTTGTCTCGTGAAGCTTTTTCTTAGTC

ACTTAAATTTGTTTTCATAGTGGTAGGTATCAAGCTTTTTTGAAAGAATGTTAACTTTAG

AATACAATTTGATTATTCTGATCACAGCTATAGTTTATATGTTGTTGGGGAAATGAGTTT

TGAAAAGATCTTTGGACCAGGCTGTTTTTTGTAATGGAATTGTCCTCTCTTAATAGGCAC

TGCTGAGGTGTCCTCTATTCTTGAAGAGCGTATTCTTGGAGCTGATACCTCTGTTGACCT

TGAAGAGACTGGGCGTGTTTTAAGTATTGGTGATGGTATTGCTCGGGTACATGGGCTAAG

AAATGTTCAAGCAGAAGAAATGGTAGAGTTTTCTTCAGGTTTAAAGGTAAATTGTAAAAT

GAGATTTAATAGTTTTAGCATTGGTGTTTCCTCAGTTATTCATTTAGTAGTTCAGAGATT

GTGTCACATTATCTTTTTTTTTTAACTTTGAATCTGAATCTGCTTCAGTGATTTTGTGTT

TGTCATTACTATAGATTGTGAAAAGAGTAAATTTTTTTGTTAACCAAACTTTATTCTCTG

GACTGATTTACACATAAGTTGTAACCATTAGCACTGAAATACAAAATTGGGTAAATTTTC

AGCCAGATTGTGAAAAGCTCAAGTCTGTTTGTAGCTGTTAAGATCATTCTATATAAAGGC

ATTTGATTAGTTAAATTCATTTTTGGCAGAAAGTTGGAAGTCATTGACTTTGTATTTCTT

GTAGGAGTAGACCTGTTGTTGAGAGGTGAGCTAGTGTTATAGCTATCAGAAGCACTAATA

ATAGAAGTGTGCTTTTTTCTATTAGATTATCGTAGTTGGCCAGTAAGGTGAGAAGTCAAA

GTTGTAGGAGTCATGGGTTCTCTGACAAAAGCAGAGTATGATATCCAGGTGGACCAGGGG

CAGTGGAATTTGGTGTCCAGTATGGAAAAAGAACCTGTTGGTGTGAAAGACTAATTATGG

AGCCAAATGTTTTATTGGTAGCTCTCAGACCTTGGCTAAAAATTTACTCTTTCTATCGTT

GTGTGTATCTTTGAAATGTTAGGCTGAAATAGAGGAACTCATTTTCATTTAACTTAAAAT

CTAGGAGTCCAGACTGATACTATCTGAAATAACTTCTGCCATGTGGAAATGTTTTATAGA

TATGGATACGGTAACTACTGAAGTTTCTCTGACTTGGTAACAGGGCAATTACTAATTTCA

ATTTTAAATAGCCATATGATGTTAGTGGCTACTCTGTTGAACATTAGAGATTTAGACTAA

AGATTGTGTACCTGCAATGGCATTCCATGGTACTCCTCTATATTTACTCTGTAATTCTTG

AGAGCTTTATTTATTGACCAGATTCAGTTCCTGGACTAGCCTTTTTGCATTGATTATATA

TGAGCTACTGCTGCTGCTAGGTCGCTTCAGTCGTGTCCGACTCTGTGCGACCCCATAGAC

AGCAGCCTACCAGGCTCCCCCGTCCCTGGGATTTTCCAGGCAAGAACACTGGAGTGGGTT

GCCATTTCCTTCTCCAATGCATGAAAGTGAAAAGTGGAAGTGAAGTCGCTCAGTCGTGTC

CGACTCTAGCGACCCCATGGATTGCAGCCTACCAGGCTTCTCAGTCCATGGGATTCTCTA

GGCAAAAGTACTGGAGTGGGGTGCCATTGCCTTCTCCAATGTATGAGCTAGGGACCTGAA

ATCTTACCATTTTGAAATTCGATCAGATTACCCAGCACTGTTCTGTTGTACAGATTTGTT

CTTGATTAGGTAGCTTTTAATTTAATTTTTTACTGACTTGATGGGTATAGGTTCTTACTA

GATAATCTTTAAAAAAGATTGTTTATGAGTTCTCATAGATGTAAATCAAGTGTGTCTTCC

TAGTTGACCCTGACACTTTACTTCATACTGGTCACCCCATTCAAAAACTGTAGTCAAAGG

AAATGCAGTGGAAGAAGCTTAAGCAGTTCAATTTCCTTGCTTATTTTAGTTTTTAGAGGA

TGTGGTAAGGTGCATGTTTGGCTTATAATTTTAAACTCTGATTATTCGAGGGAACTTGAC

AAGTGTTTACTGAAGATTGTTTGGTGGTAAAATAGAAGTGAACCAGATCTGAAAAGTTGG

TATTGCTCCCCCTTCCATTTTCATATGTAGTGTAGGTATATGGGAAGAAGTGCCACTCAG

ACTTCATGGATGTTCAATTATGTCTTTTGTGTAGGGTATGTCTTTGAACTTGGAGCCTGA

CAATGTTGGTGTTGTCGTGTTTGGAAATGATAAACTTATTAAGGAAGGAGATATTGTGAA

GAGAACTGGGGCTATTGTAGATGTTCCAGTCGGCGAGGAGCTGCTGGGTCGTGTAGTTGA

TGCCCTTGGTAATGCCATTGATGGAAAGGTAGGTTTAACATTTATTGGATTTGGTTGTAG

CTTCAAAGCAAAGAGCCAAATTGATTGTTCTGGGGTTTCTTCTTACTGTTTAACAGGGTC

CAATTGGTTCCAAGGCCCGAAGACGAGTTGGCTTGAAAGCCCCTGGGATCATTCCTCGAA

TCTCTGTGAGGGAACCAATGCAAACTGGCATTAAGGCTGTGGATAGCTTGGTGCCGATTG

GTCGTGGTCAGCGTGAGCTGATTATTGGTGACCGACAGACTGGGTAAAGACTTAACAGCT

TGTTAAAAGTTCTAACTAAAACATGCTCTATTGAAAGGTTACTTTTAGACTTGGAATGGT

AGATATTAATACTTGGACTATACGGCGAGAGTAGACTGTAATATGAGGGTAACTTGTAGT

GGAATTTAAGTTGGGGGATTCTTTGAAGTACTCAGTAAGGTTTATGTTTGTTTATTTTTT

CTTAAAGCAAAACGTCAATTGCAATTGACACAATCATTAACCAGAAACGATTCAATGATG

GAACTGATGAAAAGAAGAAGCTGTACTGTATCTATGTTGCTATTGGTCAAAAGAGATCCA

CTGTTGCCCAGTTGGTGAAGAGACTTACAGATGCAGGTATTAAGGAATTTCAGTCTCATT

GCAGTTATCTGGGATGCTGCAAATCTTAGACTAGCTTATGCTTATAATGAAGTCTGATTT

TAATTACTCCCTAATGAACTCAAATTTCTACTAATACAAGTCAATACAAAAGTAAGAAGT

AAAAAATTATATCGGTAGTATAAAGCAGCAGTAAACTGAAGGTTTTGTTAGTTTCTTTAA

AGTAGAAGCTATTAGACTGGGTAATCTTAATAGTAATGACAGTAGTAAAGTGCTTAATTT

TTATTCTAGTAGCCTCTAATTTAAAATCATAGTATTAATAATCATGTAAAACTTAATGTT

TATTTTCTTCTCAGATGCCATGAAGTATACCATTGTGGTTTCAGCTACTGCTTCAGATGC

TGCCCCACTTCAGTACTTGGCTCCTTATTCTGGATGTTCAATGGGAGAATATTTTAGGGA

TAATGGCAAACACGCTTTGATCATTTATGATGACTTATCCAAACAGGTCAAAAGAAATGT

GTTTTTATACATGTTTATATGTTTGTATGTGGTAGTTGACAAATGTAGCTCCTGTCTAAT

AGGTGCACACTTTTCTATACTGTAGGCGGTTGCTTATCGTCAGATGTCTCTGCTGCTCCG

CCGACCCCCTGGTCGTGAGGCCTATCCTGGTGATGTATTCTACCTGCACTCCCGACTCCT

GGAGAGAGCAGCTAAAATGAACGATGCTTTTGGTGGTGGCTCCTTGACTGCTCTACCAGT

CATCGAAACACAAGCTGGTGATGTGTCTGCTTACATTCCAACAAATGTCATTTCCATCAC

TGACGGACAGGTATTATTTTTATGATTAAATATGAAAACTTTGGGTGATTTCAAGGCAGT

AATTGAGACTGGTAGTTTTGAACTAATTTGTTAAATTCCTTTTACTTCTCGTTATGGAAA

ACCTCAATTGTAAAGAGAATAGTATAATGAAACCCCACATATCCCACCTATTTATGTATT

GATGGTATAGTATACTTCATTCTTGCTTTCTTTTTCCCCACGGTTCTCTTGTGTGTAATT

TTGAAGCAAATCCTAGAGAGATCACATCACTTAAATCACCAATTTAAGTTTTACTGTAAA

TATGGTACCTAATTTTTTCGCATCTCACGTCTCCTCATCTCCGCAATGGAATATACAGGA

TGATTTTGAGTTGTGAAAGATTTAAGGAGCTCTTTAGGATAAGAAGCCATTTAGCATTCT

TTGGTTTTGGGGCTTCAGTTTTTGCTATAGTGACTTAATTGTGAAAATAATTGATTTCTT

TAAGCTTGCTAATATGCCTCTGTATTTTCCTTACATTGTAGATCTTCTTGGAAACAGAAT

TGTTCTACAAAGGTATCCGCCCTGCCATTAATGTTGGTTTGTCTGTGTCCCGTGTCGGAT

CTGCTGCCCAAACCAGGGCCATGAAACAGGTAATTTGTATCACTTTGTCATTAGGTTAAA

AATAAAAATGTATTTGTATGGTGGTCTGTGTCATTGAAGTATTTTTGTATTGTTTGAGTT

AACCATTTCTGTTTCAGGTGGCAGGTACTATGAAACTGGAGTTGGCTCAGTATCGTGAGG

TTGCTGCTTTTGCCCAGTTCGGTTCTGACCTTGATGCTGCCACTCAACAACTCTTGAGTC

GTGGTGTGCGTTTGACTGAGCTGCTCAAGCAGGGACAGTATTGTGAGTTGTACATTTGGT

CAAGTTCCTACTCTGTGTTAGGACCTGGGAATATCACATTAGCTCCTTACAAACTGTAGT

ATGTGCCATTACCTTTGATTAAAGATGTTGCCTTTTGAATGTGATTGATACCTGTTTTAA

TTAATTACAGTCATCATTTCAATGGAATTGCTAGGCCGGGTATAATAATACCTTTCTTTT

GGAAATTAAGACATAGTAGATTCTATGTCTCCCTACCATTTCCTTGGCTATATACGTGTG

GAATCTGGCAGATTTAAAAGAATGTTGAAGGTGAAGGTCGCTCAGTCATATCCAACTCTT

CGACCCTATGGACTATCCAGTCCATGGAGTTCGCCCAGGCCACAGTGCTGGCAGTGGGTA

GCCTTGACCTTCTATCAGGGGATCCTTCCCAACCCAGGGATTTGAACCCACGTCTCCCAT

ATATGCTAGGGGATTCTTTACCGAGCTGAGCCACAAGGATAACTAATAGATAACTAATAA

ACTAATAATTAACTAAAGAGTAACTAATAAAGAACGTTAGTATTGGGAATTCTCCAGGGG

TCCAGTGGTTAGGACCTCTGACTCACTGCCAAGGACCTGGCTTCTATCCCTGATTGGGGA

ACTAAGTCTCGCAAGCTATGTGGTGCAGCCAAAAAATCTGCATTAATCTTAGTCCTGTAA

TTAGTAAAATTTCAGCAAGTTATTTTTACCCCAGACAGTCCTTTTGGGTGATGGATGGTG

CTCATGGAATAAGTGCAAAGTTGTACTTCAAGGCTTACCAATAAGGGGAAAAAGCTGTTT

CTCCAGGGAGGTGGGAAGGAGTACTAATAATGGAATTTCTACTTGTGAAATTCCATGATC

TATGAAGACATGTTAATAATTTGTGAAAAAAATAAGTTTCTCTAACTCTGGAAACAATGG

CATGCATTTGTTGAGCAACTTACTTCTTTCTTTTCAGCTCCCATGGCTATTGAAGAGCAA

GTGGCTGTTATCTATGCGGGTGTCAGGGGGTATCTTGACAAGCTGGAGCCCAGCAAGATC

ACAAAATTTGAGAATGCTTTCTTGTCTCACGTTATCAGCCAACATCAGGCCCTGTTGAGC

AAAATCAGGTATGAACATAACTGATGTCTCCTTTTTTGTAAGCTTTAAAATGAAAAGTCT

TGTTAAAATTCTTTTGAATTCTGTAATTAGGTTAGTCATTGAATTTTTGCCCAGGTCACA

ACTGATCTGCTTTTGTTTTCAAATAGGACCGATGGAAAGATCTCAGAAGAGTCAGATGCA

AAGCTGAAAGAGATTGTAACAAACTTCTTGGCTGGATTTGAAGCTTAAACTCCTGTGGAT

TCACATCAAATGCCAGTTTGGTTTTGTCATTGTTTCTTCTAGTTCCATTCGGATTACTCC

AATACTGCAGATGTACAGTAATCACATTAAAATAAAGGTTCCATGTTGCTTGGTGGTTTT

CTATAGATTGATTCTTTAAAAGAACTGAGATTACTTTGAGGAATTGGTAAATATGTTTCT

TAGCTTTTTTTACTTTATTAAAGTTAGCAGGCCTACATAATATTTATGACTGAGTTCTTT

GCACGATTCCAGAGTGTTTTTTGATTGATTAAAGAGAAATTCACTAACTGGCCATAAGAG

GCAAAGTTCATATTTGATAATGTGAAAAGCCTGACTGGCTTCTCTGCCCAGGAGACTGAT

CTGCATGAAGAGGTACTGTAATCAGTAAAAAAAAAAAAAAAAAAAATAGGGCAACTAAGG

TTTTCAAAGAAATGAAAAAAAATGCTAAGTGCAGAATAAAATATTAGGACAAAAATTGCA

AAAGTAGGTATCAGAATGAATAAAGTTGTGAACATGTCAATATCTTTGCTTTAAAATAGC

TTTCATACACTGCAG

Резултат

<https://blast.ncbi.nlm.nih.gov/Blast.cgi>

[B.taurus atpA1 gene for F(0)F(1) ATP synthase alpha-subunit](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_101)

[Bos mutus isolate yakQH1 chromosome 24](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_1353793182)

<https://www.uniprot.org/blast/>

<https://www.youtube.com/results?search_query=Molecular+Architecture+of+the+Rotary+Motor+in+ATP+Synthase+from+Yeast+Mitochondria>

http://www.youtube.com/watch?v=XI8m6o0gXDY

http://www.youtube.com/watch?v=lRlTBRPv6xM resp. chain

Seq5

Thermus aquaticus gene for DNA polymerase, complete cds

GenBank: D32013.1

ATGAGGGGGATGCTGCCCCTCTTTGAGCCCAAGGGCCGGGTCCTCCTGGTGGACGGCCACCACCTGGCCT

ACCGCACCTTCCACGCCCTGAAGGGCCTCACCACCAGCCGGGGGGAGCCGGTGCAGGCGGTCTACGGCTT

CGCCAAGAGCCTCCTCAAGGCCCTCAAGGAGGACGGGGACGCGGTGATCGTGGTCTTTGACGCCAAGGCC

CCCTCCTTCCGCCACGAGGCCTACGGGGGGTACAAGGCGGGCCGGGCCCCCACGCCGGAGGACTTTCCCC

GGCAACTCGCCCTCATCAAGGAGCTGGTGGACCTCCTGGGGCTGGCGCGCCTCGAGGTCCCGGGCTACGA

GGCGGACGACGTCCTGGCCAGCCTGGCCAAGAAGGCGGAAAAGGAGGGCTACGAGGTCCGCATCCTCACC

GCCGACAAAGACCTTTACCAGCTCCTTTCCGACCGCATCCACGCCCTCCACCCCGAGGGGTACCTCATCA

CCCCGGCCTGGCTTTGGGAAAAGTACGGCCTGAGGCCCGACCAGTGGGCCGACTACCGGGCCCTGACCGG

GGACGAGTCCGACAACCTTCCCGGGGTCAAGGGCATCGGGGAGAAGACGGCGAGGAAGCTTCTGGAGGAG

TGGGGGAGCCTGGAAGCCCTCCTCAAGAACCTGGACCGGCTGAAGCCCGCCATCCGGGAGAAGATCCTGG

CCCACATGGACGATCTGAAGCTCTCCTGGGACCTGGCCAAGGTGCGCACCGACCTGCCCCTGGAGGTGGA

CTTCGCCAAAAGGCGGGAGCCCGACCGGGAGAGGCTTAGGGCCTTTCTGGAGAGGCTTGAGTTTGGCAGC

CTCCTCCACGAGTTCGGCCTTCTGGAAAGCCCCAAGGCCCTGGAGGAGGCCCCCTGGCCCCCGCCGGAAG

GGGCCTTCGTGGGCTTTGTGCTTTCCCGCAAGGAGCCCATGTGGGCCGATCTTCTGGCCCTGGCCGCCGC

CAGGGGGGGCCGGGTCCACCGGGCCCCCGAGCCTTATAAAGCCCTCAGGGACCTGAAGGAGGCGCGGGGG

CTTCTCGCCAAAGACCTGAGCGTTCTGGCCCTGAGGGAAGGCCTTGGCCTCCCGCCCGGCGACGACCCCA

TGCTCCTCGCCTACCTCCTGGACCCTTCCAACACCACCCCCGAGGGGGTGGCCCGGCGCTACGGCGGGGA

GTGGACGGAGGAGGCGGGGGAGCGGGCCGCCCTTTCCGAGAGGCTCTTCGCCAACCTGTGGGGGAGGCTT

GAGGGGGAGGAGAGGCTCCTTTGGCTTTACCGGGAGGTGGAGAGGCCCCTTTCCGCTGTCCTGGCCCACA

TGGAGGCCACGGGGGTGCGCCTGGACGTGGCCTATCTCAGGGCCTTGTCCCTGGAGGTGGCCGAGGAGAT

CGCCCGCCTCGAGGCCGAGGTCTTCCGCCTGGCCGGCCACCCCTTCAACCTCAACTCCCGGGACCAGCTG

GAAAGGGTCCTCTTTGACGAGCTAGGGCTTCCCGCCATCGGCAAGACGGAGAAGACCGGCAAGCGCTCCA

CCAGCGCCGCCGTCCTGGAGGCCCTCCGCGAGGCCCACCCCATCGTGGAGAAGATCCTGCAGTACCGGGA

GCTCACCAAGCTGAAGAGCACCTACATTGACCCCTTGCCGGACCTCATCCACCCCAGGACGGGCCGCCTC

CACACCCGCTTCAACCAGACGGCCACGGCCACGGGCAGGCTAAGTAGCTCCGATCCCAACCTCCAGAACA

TCCCCGTCCGCACCCCGCTTGGGCAGAGGATCCGCCGGGCCTTCATCGCCGAGGAGGGGTGGCTATTGGT

GGCCCTGGACTATAGCCAGATAGAGCTCAGGGTGCTGGCCCACCTCTCCGGCGACGAGAACCTGATCCGG

GTCTTCCAGGAGGGGCGGGACATCCACACGGAGACCGCCAGCTGGATGTTCGGCGTCCCCCGGGAGGCCG

TGGACCCCCTGATGCGCCGGGCGGCCAAGACCATCAACTTCGGGGTCCTCTACGGCATGTCGGCCCACCG

CCTCTCCCAGGAGCTAGCCATCCCTTACGAGGAGGCCCAGGCCTTCATTGAGCGCTACTTTCAGAGCTTC

CCCAAGGTGCGGGCCTGGATTGAGAAGACCCTGGAGGAGGGCAGGAGGCGGGGGTACGTGGAGACCCTCT

TCGGCCGCCGCCGCTACGTGCCAGACCTAGAGGCCCGGGTGAAGAGCGTGCGGGAGGCGGCCGAGCGCAT

GGCCTTCAACATGCCCGTCCAGGGCACCGCCGCCGACCTCATGAAGCTGGCTATGGTGAAGCTCTTCCCC

AGGCTGGAGGAAATGGGGGCCAGGATGCTCCTTCAGGTCCACGACGAGCTGGTCCTCGAGGCCCCAAAAG

AGAGGGCGGAGGCCGTGGCCCGGCTGGCCAAGGAGGTCATGGAGGGGGTGTATCCCCTGGCCGTGCCCCT

GGAGGTGGAGGTGGGGATAGGGGAGGACTGGCTCTCCGCCAAGGAGTGATACCACCCCATGCTGGCCCAA

GCCAGCATGGGGGCCCCGGCAAAAGGTTTCTGGGGAAGTTACCAGGCATGGTGGGCCGAAGGAAACAGGA

AACAAGGGTATGAGGGTTTTTTGCCCTAAAGAAAGGCCAGGGGGTCCTCCCGAAGGAAGGCTTCCAGGGG

GATACCCCCTGGGCCCAGGAGTAGCCCCTTTCCTCCAAAGGCCTGGGTGAAGGCTTTTAGCCCTTTGGTC

CTTTGGGAAGGGGCGCTTTTGACCTCCAAAGCCAGAAGGCGCCTTCCCTTCTTCAAGACGAAGTCAACCT

CCTGGTCCCTTTCCCGCCAGTAGTACACCTCAAAGCCCCCGTGGGGGCCGTGGGCCAGAAGGTGGGCGCC

CACGGCGGTTTCCACGAGCCGCCCCATGAGGGCGGCGTCCGCCCACACCTCCTTTGGGGAAAGCCCCAAG

ACCGCCGTGATGAGCCCCGTATTAAGGGCCAGGAGCTTGGGGCTCGAGGCGCGGCGCCGGAAGGGCTCGG

CGGCGTACTTCTGCAG

Резултат

<https://blast.ncbi.nlm.nih.gov/Blast.cgi>

[Thermus aquaticus gene for DNA polymerase, complete cds](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_507890)

[Thermus aquaticus Y51MC23, complete genome](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_939575972)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mechanism of DNA Replication

http://www.youtube.com/watch?v=bee6PWUgPo8

http://www.youtube.com/watch?v=vn\_HICkswI4

http://www.youtube.com/watch?v=ldXXGt8Ihss !