Mouse 2-5A synthetase cDNA: nucleotide sequence and comparison to human 2-5A synthetase

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(2'-5')Oligoadenylate synthetase (2-5A synthetase), an enzyme induced by interferons, has been considered to be involved in the antiviral action of interferon. From a cDNA library prepared from 17S poly(A)$^+$ RNA of interferon-treated mouse L cells, several cDNAs cross-hybridizing to the human 2-5A synthetase cDNA (1) were isolated and sequenced (upper figure). A plausible initiation codon, the termination codon and the polyadenylation signal are underlined. The lower figure shows the deduced amino acid sequence (367 residues, 42,456 daltons), which is compared to the sequence of the human 2-5A synthetase coded by the 1.8kb-mRNA(2). Identical amino acids are underlined and the dotted lines represent amino acid gaps introduced to maximize homology. The sequence of 35 amino acids near the C-terminus of the human enzyme is missing from the mouse enzyme. The nucleotide and amino acid sequence homologies between human and mouse 2-5A synthetase are 73% and 69%, respectively.

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   1 CCAGGCTGGGAGACCCAGGA AGCTCCAGACTTAGCATGGA GCACGGACTCAGGAGCATCC CAGCCTGGACGCTGGACAAG TTCATAGAGGATTACCTCCT
 101 TCCCGACACCACCTTTGGTG CTGATGTCAAATCAGCCGTC AATGTCGTGTGTGATTTCCT GAAGGAGAGATGCTTCCAAG GTGCTGCCCACCCAGTGAGG
 201 GTCTCCAAGGTGGTGAAGGG TGGCTCCTCAGGCAAAGGCA CCACACTCAAGGGCAGGTCA GACGCTGACCTGGTGGTGTT CCTTAACAATCTCACCAGCT
 301 TTGAGGATCAGTTAAACCGA CGGGGAGAGTTCATCAAGGA AATTAAGAAACAGCTGTACG AGGTTCAGCATGAGAGACGT TTTAGAGTCAAGTTTGAGGT
 401 CCAGAGTTCATGGTGGCCCA ACGCCCGGTCTCTGAGCTTC AAGCTGAGCGCCCCCCATCT GCATCAGGAGGTGGAGTTTG ATGTGCTGCCAGCCTTTGAT
 501 GTCCTGGGTCATGTTAATAC TTCCAGCAAGCCTGATCCCA GAATCTATGCCATCGTCATC GAGGAATGTACCTCCCTGGG GAAGGATGGCGAGTTCTCTA
 601 CCTGCTTCACGGAGCTCCAG CGGAACTTCCTGAAGCAGCG CCCAACCAAGCTGAAGAGTC TCATCCGCCTGGTCAAGCAC TGGTACCAACTGTGTAAGGA
 701 GAAGCTGGGGAAGCCATTGC CTCCACAGTACGCCCTAGAG TTGCTCACTGTCTTTGCCTG GGAACAAGGGAATGGATGTT ATGAGTTCAACACAGCCCAG
 801 GGCTTCCGGACCGTCTTGGA ACTGGTCATCAATTATCAGC ATCTTCGAATCTACTGGACA AAGTATTATGACTTTCAACA CCAGGAGGTCTCCAAATACC
 901 TGCACAGACAGCTCAGAAAA GCCAGGCCTGTGATCCTGGA CCCAGCTGACCCAACAGGGA ATGTGGCCGGTGGGAACCCA GAGGGCTGGAGGCGGTTGGC
1001 TGAAGAGGCTGATGTGTGGC TATGGTACCCATGTTTTATT AAAAAGGATGGTTCCCGAGT GAGCTCCTGGGATGTGCCGA CGGTGGTTCCTGTACCTTTT
1101 GAGCAGGTAGAAGAGAACTG GACATGTATCCTGCTGTGAG CACAGCAGCACCTGCCCAGG AGACTGCTGGTCAGGGGCAT TTGCTGCTCTGCTGCAGGCC
1201 CATGACCCAGTGAGGGAGGG CCCCACCTGGCATCAGACTC CGTGCTTCTGATGCCTGCCA GCCATGTTTGACTCCTGTCC AATCACAGCCAGCCTTCCTC
1301 AACAGATTCAGAAGGAGAGG AAAGAACACACGCTTGGTGT CCATCTGTCCACCTGTTGGA AGGTTCTGTCTGACAAAGTC TGATCAACAATAAACCACAG
1401 CAGGTGCCGTC(A)n
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                1                  20                  40                  60                  80
MOUSE           MEHGLRSIPAWTLDKFIEDYLLPDTTFGADVKSAVMVVCDFLKERCPQGAAHPVRVSKVVKGGSSGKGTTLKGRSDADLVVFLNNLTSFEDQL
HUMAN 1.8kb       MDLRNTPAKSLDKFIEDYLLPDTCFRMQINHAIDIICGFLKERCFRGSSYPVCVSKVVKGGSSGKGTTLRGRSDADLVVFLSPLTTFQDQL
    100                 120                 140                 160                 180                 200
NRRGEFIKEIKKQLYEVQHERRFRVKPEVQSSWWPMARSLSFKLSAPHLHQEVEFDVLPAFDVLGHVNTSSKPDPRIYAILIEECTSLGKDGEFSTCFTELQRNFLKQ
NRRGEFIQKIRRQLRACQRERAFSVKPEVQAPRWGWPRALSFVLSSLQLGEGVEFDWLPAFDALGQLTGSYKPNPQIYVKLIEECTDLQKEGEFSTCFTELQRDFLKQ
                220                 240                 260                 280                 300
RPTKLKSLIRLVEHWYQLCKEKLGKPLPPQYALELLTVFAWEQGWGCYEFNTAQGFRTVLELVIDYQHLRIYWTKYYDFQHQEVSKYLHRQLEKARPVILDPADPTGN
RPTKLKSLIRLVKHWYQWCKKKLGK-LPPQYALELLTVYAWERGSMKTHFNTAQGFRTVLELVIDYQQLCIYWTKYYDFKNPIIEKYLRRQLTKPRPVILDPADPTGN
    320                 340                 348                 349                 360
VAGGMPEGWRRLAKEADVWLMYPCFIKKDGSRVSSWDVP----------------------------------TVVPVPFEQVEEWTCILL
LGGGDPKGWRQLAQEAEAWLMYPCFKWWDGSPVSSWILLAESWSTDDETDDPRTTQKIYGIGTHEYPHFSHRPSTLQAASTPQAEEDWTCTIL
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