

Nucleotide sequence of the cDNA encoding the rat argininosuccinate synthetase

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Argininosuccinate synthetase is a key cytoplasmic enzyme in the mammalian urea cycle. The cDNA and genomic clones encoding the human gene have been isolated and characterized (1, 2). By screening with a human cDNA clone, a 1495 bp clone was isolated from a rat kidney cDNA library. A protein of 412 amino acids is coded with 97% identity to the human enzyme. At a nucleotide level, there is 89% identity over the translated region. In the human, the AUG start codon is in exon 3. There are 14 bp 5' to the start site in the rat clone analysed, with only 5 out of these 14 nucleotides being identical with the human. In the 3' untranslated region, there is an overall 75% identity, with an internal region of 25 nucleotides having 92% identity to the human.

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-14: CAGT CCAGACAGC AAG TCC AGC AAG GGC TCT TGG GTF CAG GCC TAC AGT GGT GGT CAG GCC ACC TCC TGC ATC CTC GTG TGG CTG AAG GAA
  1:  H S S K G C S V V L A Y S G G L D T S C I L V W L K E
 79: CAA GCG TAT GAT GTC ATC GCC TAC CTG GCC AAC ATT GGC CAG AAG GAA GAC TTT GAG GAA GGC AGG AAG AAG GCA CTG AAG CTT GGG GCC
27:  Q G Y D V I A Y L A W I G Q K E D F E E A R K K A L K L G A
169: AAA AAG GTG TTC ATY GAG GAT GEA ALC AAG GAG TTT GTG GAA GAG TTC ATC TGG CTT GCT GTC CAG TCC AGT GCA CTC TAT GAG GAC CCG
57:  K K V F I E D V S K E F V E F I A Q R E G A K Y V S H
259: TAT CTC CTA GGC ACC TCT CTC GCC AAG CCT TCC ATA GCT CCG AAA CAA GTG GAA ATY CCG CAG GCC GAA GGG GCC AAG TAT GTG TCT CAC
87:  Y L L G T S L A R P C I A R K Q V E I A Q R E G A K Y V S H
349: GGC GCC ACG GGG AAG GGC AAT GAG CAG GTC CAG CTT GAG CTC ACC TGC TAC TCG TGA GCA CCG CAG ATY AAG GTC ATC GCC CCG TGG ACG
117:  G A T G K G W D Q V R F E L T C Y S L A P Q I K V I A P W R
439: AAG CCC GAG TTT TAC AAC CCG TTC AAC GCC CCA AAT GAT TGG AAG GAA TAC CCA AAG CAA CRT GEA ATC CCC ATC CTT GTC ACC CCC AAG
147:  H P E F Y W R F K G R W D L M E Y A K Q H G I P I F V T P K
529: ACG CCC TGG ACG AAG GAT GAG AAC CTT AAG CAG ATC AAG TAC GAG GCT GGA ATC CTG GAA AAC CCC AAG AAC CAA GCA CCA CCA GGT CTC
177:  S P W S W D E W L N H I S Y E A G I L E W P K W Q A P P G L
619: TAC ATA AAA ACT CAG GAC CCT GCC AAA GCA CCG AAC ACC CCA GAT GTC CTT GAG ATA GAA TTC AAA AAA GGG GTC CTT GTG AAG GTG ACC
207:  Y T K T Q D F A K A F W T P D V L E I E F K K G V P V K V T
709: AAC GTC AAA GAT GGC ACT ACC CAC ACC ACA TCC TGG GAG CTC TTC AAG TAC CTG AAT GAA GTT GGG AGC AAC CRT GGA GTA GGG CCG ATT
237:  N V K D M G N D E W L N H I S Y E A G I L E W P K W Q A P P G L
799: GAC ATC GTG GAG AAC CCG TAC ATY GEA AAG AAG TCC CCG GAT ATC TAC GAG ACC CCA GCA GGG ACC ATC CTT TAC CAC GCT CRT TGA GAC
267:  D I V E W R F I G H K S R G I Y E T P A G T I L Y H A R L D
889: ATA GAG GCC TTC ACC AAG GAT CCG GAA GTA CCG AAA ATC AAG CAG GCC CTG GGC CTC AAA TTC GCA GAG CTC GEA TAC ACC GGT TTC TGG
297:  I E A F T W D R E V R K I K Q G L G L K F A E L V Y T G F W
979: CAC ACG CTT GAA TGT GAA TTT GTT CCG CAC TCC ATC CAG AAG TCC CAG GAA CCG GAG GAA AAG GCG CAG GEA TCT GTC TTC AAG GGC
327:  H S P E C E F V R H C I D K S Q E R V E G K V Q V S V F K G
1069: CAG GTG TAC ATC CTT GGC CCG GAG TCT CCA CTT TCA CTA TAC AAT GAA GAG CTG GAG ACC AAG AAC GEA CAG GGT GAC TAT GAA CCG ATT
357:  Q V Y I L G R E S F L S L Y H E E L V S H W V Q G D Y E P I
1159: GAT GCC ACC GGC TTC ATC AAT ATC AAC TGG CTC AAG CAG AAG GAG TAC CRT CCG CTT CAG ACC AAG GTC ACC GCC AAA TAG A CCGGACAAA
387:  D A T G F I H I W S L R L K E Y H R L Q S K V T A K ***
1251: GAGGGGGGGC CCGGGGGGTC TCGACGCTTC CCGGCGTCCA GCGTAAATGG TGGGHTAAA TTGGTAAATG TACCTGTTTC TCGTACGACC TCGACGGGGC TCGCGGGCC
1361: CCGCTACCTT CCGGGGGGTC CAGCGGCTTT GGTCCCTGGT CCGCGTGGC CTCGAAAGT GGTCTACGAA GCGGAGGGGG GGTGGCGGGC AGCTCGGGA AGCGGTAAA
1469: KRGCAATZA A
    
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Figure 1. Nucleotide and amino acid sequence of rat argininosuccinate synthetase.

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