

Nucleotide sequence of cDNA encoding subunit IV of cytochrome *c* oxidase from fetal rat liver

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Mammalian cytochrome *c* oxidase consists of 13 subunits of which 3 bigger subunits are encoded by mitochondria while the rest are contributed by the nuclear genome (1). There is an increasing awareness that these nuclear coded subunits might exist as isogenes and be developmentally regulated (2). In an attempt to isolate the fetal gene of subunit IV, approximately 150,000 pfu of a cDNA library from fetal rat liver in λ gt11 was screened with affinity purified subunit-specific antiserum against adult liver subunit IV. A single positive clone was obtained, subcloned in M13mp8 and sequenced by dideoxy termination method. It is 80 and 87% homologous to the human adult gene and bovine pseudogene respectively at the amino acid level (3). We presume from the extent of homology that this could be the adult counterpart of human and bovine subunits in rat. The identical amino acids from human gene are underlined.

M L A T R A L S L I G K R A

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GGGCAGCAGTGGCAGAATGTTGGCTACCAGGGCACTTAGCCTAATTGGCAAGAGAGCC 58
I S T S V C L R A H G S V V K S E D Y A
ATTTCTACTTCGGTGTGCCTTCGGGCACATGGGAGTGTGTGAAGAGTGAAGACTATGCT 118
L P S Y V D R R D Y P L P D V A H V K L
CTCCCATCTTATGTTGATCGGGCGTGACTACCCTTGCCCTGATGTGGCCCAAGCTG 178
L S A S Q K A L K E K E K A D W S S L S
CTGTCTGCCAGCCAGAAGGCCCTGAAGGAGAAGGAGAAGGCCGACTGGAGCAGCCTTTC 238
R D E K Y Q L Y R I Q F N E S F A E M N
AGGGATGAGAAAGTCCAATTGTACCGCATCCAGTTAACGAGAGCTTCGCTGAGATGAAC 298
K G T N E W K T V V G L A M F F I G F T
AAGGGCACCAATGAGTGGGAAGACAGTGGTGGGCTGGCCATGTTCTTCATCGGCTTCACT 358
A L V L I W E K S Y V Y G P I P H T F D
GGCCTTGCTGCTGATCTGGGAGAAGAGCTACGTGATGGCCCCATCCCTCATACCTTTGAT 418
R D W V A M Q T K R M L D M K V N P I Q
CGTGACTGGGTGGCCATGCAGACCAAGCGGATGCTGGACATGAAGGTCAACCCATTAG 478
G F S A K W D Y N K N E W K K e
GGCTTCTCCGCAAGTGGGACTACAACAAGAATGAATGGAAGAAGTGAGAGCCTGCTGCT 538
GTGGGC 544

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References:

- (1) Kadenbach, B., Kuhn-Nentwig, L. and Büge, H. (1987) *Current Topic Bioenerg.* 15:113-161.
- (2) Kuhn-Nentwig, L. and Kadenbach, B. (1985) *Eur. J. Biochem.* 149:147-158.
- (3) Zeviani, M., Nakagawa, M., Herbert, J., Lomax, M.I., Grossman, L.I., Sherbany, A.A., Miranda, A.F., DiMauro, S. and Schon, E.A. (1987) *Gene* 55:205-217.