Sequence of a cDNA specifying subunit VIa of human cytochrome *c* oxidase

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Cytochrome c oxidase (COX; EC 1.9.3.1) catalyzes the transfer of electrons from reduced cytochrome c to molecular oxygen in the mitochondrial respiratory chain. In mammals, the apoprotein is composed of three larger catalytic subunits, encoded by the mitochondrial genome, and by ten smaller, nuclear-encoded subunits, which may play a regulatory role (1); subunits VIa, VIIa, and VIII have been shown to have heart- and liver-specific isoforms in cows and pigs (2), and cDNAs encoding the heart- and liver-specific isoforms of subunit VIa have been isolated from rat (3). Using a rat liver COX VIa cDNA (3) as a probe, we isolated a partial-length clone from a human liver cDNA library (a gift of G. Ricca, Meloy Laboratories), and a full-length clone (pCOX6a.24; sequence below) from a human endothelial cell cDNA library (a gift of M. Chao and D. Littman). The deduced polypeptide is 87% identical to rat liver COX VIa, but only 51% identical to rat heart COX VIa (3). Like rat heart COX VIa and VIc (4), human liver COX VIa does not contain an in-frame cleavable presequence for importation into mitochondria.

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                [5' EcoRI linker] TTTTTTTTTTTTTAGAAGAAATAATGTGGT   (30)

AGTTGGTGTGTCCTCGGTTTCTCGGCTGCTGGGTCGGTCCGCCCACAGCTGGGGCGGCCT      (90)

ATGTCGAGTGGCGCCCATGGCGAAGAGGGCTCAGCTGCATGTGGAAGACTCTCACCTTC      (150)
M  S  S  G  A  H  G  E  E  G  S  A  R  M  W  K  T  L  T  F       [20]

TTCGTCGCGCTCCCCGGGGTGGCAGTCAGCATGCTGAATGTGTACCTGAAGTCGCACCAC     (210)
F  V  A  L  P  G  V  A  V  S  M  L  D  V  Y  L  K  S  H  H       [40]

GGAGAGCACGAGAGACCCGAGTTCATCGCCTACCCCCATCTCCGCATCAGGACCAAGCCG     (270)
G  E  H  E  R  P  E  F  I  A  Y  P  H  L  R  I  R  T  K  P       [60]

TTTCCCTGGGGAGATGGTAACCATACTCTATTCCATAACCCTCATGTGAATCCACTTCCA     (330)
F  P  W  G  D  G  N  H  T  L  L  H  N  P  H  V  N  P  L  P       [80]

ACTGGCTACGAAGATGAATAAAGAGAATCTGGACCACTACCCGGGCACCAGGGACCACAG     (390)
T  G  Y  E  D  E  *                                               [86]

CACTGGTTTGGACCGTTACTCTGCACATGGACCAGAAAAAGTATATGGGACCTTAAGCTC     (450)

ACCTTCTTTACTTGTATCAAATGATGACTGGTATACTGGTCTCCCATCCCTTTGCTTGTG     (510)

GCAGGAGATGGCTTAAATAAATAACTTAAACTT - poly(A) [3' EcoRI linker]     (543)
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Notes: (1) Kadenbach et al. (1987) Curr. Top. Bioenerg. 15, 113; (2) Kadenbach et al. (1983) TIBS 8, 398; (3) Schlerf et al. (1988) EMBO J. 8, 2387; (4) Suske et al. (1987) Eur. J. Biochem. 168, 233. Supported by grants from NIH (NS11766), the Muscular Dystrophy Association, the Aaron Diamond Foundation, and a donation from Dr. and Mrs. Libero Danesi.

